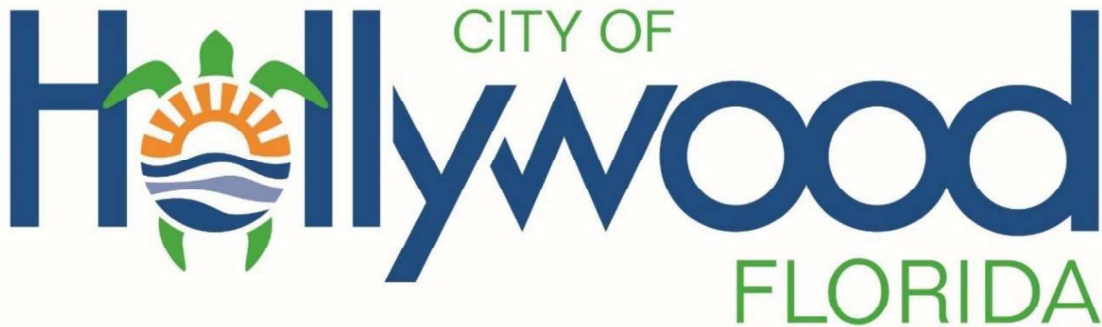


CITY OF HOLLYWOOD
CONTRACT DOCUMENTS AND SPECIFICATIONS FOR
REPLACEMENT OF NANOFILTRATION
PROCESS PRESSURE VESSELS AND
MEMBRANE

October 2024



Prepared By:

ENGINEERING SUPPORT SERVICES DIVISION

1621 N 14TH Avenue

PO Box 229045

Hollywood, FL 33022-9045



Invitation for Bids

[IFB-211-24-JJ]

REPLACEMENT OF NANOFILTRATION PROCESS PRESSURE VESSELS AND MEMBRANE ELEMENTS

Project Number: 23-4260

FOR THE

CITY OF HOLLYWOOD, FLORIDA (CITY)

IFB Issue Date: June 6, 2024
Pre-Bid Meeting Date: June 18, 2024, at 10:00 a.m. ET
Questions Due Date: July 2, 2024, at 3:00 p.m. ET
Submittal Due Date: July 11, 2024, at 3:00 p.m. ET

**CITY OF HOLLYWOOD
IFB-211-24-JJ**

**MEMBRANE SOFTENING PLANT MEMBRANE REPLACEMENT AT THE WATER TREATMENT PLANT
Project Number: 23-4260**

TABLE OF CONTENTS

<p><u>SECTION I – INTRODUCTION</u></p> <p>1.1 Purpose 1.2 Pre-bid Conference 1.3 OpenGov 1.4 Point of Contact 1.5 Cone of Silence</p>	<p><u>SECTION III – SCOPE OF SERVICES</u></p> <p>3.1 Project Description 3.2 Technical Specifications 3.3 Contractor Qualifications 3.4 Subcontractors 3.5 Deliverables and Objectives 3.6 Project Schedule / Timeline 3.7 Questions 3.8 Substantial Completion</p>
<p><u>SECTION II – SPECIAL TERMS AND CONDITIONS</u></p> <p>2.1 Addenda, Changes, and Interpretations 2.2 Dimensions, Quantities and Subsurface Information 2.3 Trench Safety Form 2.4 Changes and Alterations 2.5 Bidder’s Costs 2.6 Pricing/Delivery 2.7 Price Validity 2.8 No Exclusive Contract 2.9 Responsive 2.10 Responsible 2.11 Minimum Qualifications 2.12 Award of Contract 2.13 Execution Of Contract: 2.14 Failure To Execute Contract, Bid Guaranty Forfeited 2.15 Manufacturer/Brand/Model Request 2.16 Permits and Fees 2.17 Contract Security 2.18 Contract Period 2.19 Bid Guaranty 2.20 Warranties of Usage 2.21 Rules and Submittals of Bids 2.22 Tie Breaker 2.23 Conflict of Interests Prohibited 2.24 Protest Procedure 2.25 Insurance Requirements 2.26 Uncontrollable Circumstances (Force Majeure) 2.27 Supplier Portal (Oracle) Payment Method 2.28 Debarred or Suspended Bidders or Proposers 2.29 Payment and Performance Bond 2.30 Public Records 2.31 Local Preference</p>	<p><u>SECTION IV – GENERAL TERMS & CONDITIONS</u></p> <p><u>SECTION V – FORM(S)</u></p> <p>Form 1 Submittal Checklist Form* Form 2 Acknowledgement and Signature Page Form 3 Bid Form* Form 4 Vendor Reference Form Form 5 Hold Harmless and Indemnity Clause Form 6 Non-Collusion Affidavit Form 7 Sworn Statement...Public Entity Crimes Form 8 Certifications Regarding Debarment... Form 9 Drug-Free Workplace Program Form 10 Solicitation, Giving, and Acceptance... Form 11 W-9 (Request for Taxpayer Identification) Form 12 Trench Safety Form* Form 13 N/A Form 14 List of Subcontractors Form 15 Information Required from Bidders Form 16 Proposal</p> <p><u>SECTION VI – ATTACHMENTS/EXHIBITS</u></p> <p>Attachment A – Contract Documents, Payment, and Performance Bond Attachment B – General Conditions Attachment C - Supplementary General Conditions Attachment D – Technical Specifications and Drawings</p>

SECTION I – INTRODUCTION

1.1 **Purpose**

The City of Hollywood, Florida (City) is seeking bids from qualified and experienced firms, hereinafter referred to as the Contractor or Bidder, to furnish and install replacement membrane pressure vessels and membrane elements in the 2.0 million gallons per day plant Nanofiltration Units which contains three stages for the City, in accordance with the terms, conditions, and specifications contained in this solicitation. Responses to this solicitation are due by **July 11, 2024 by 3:00 PM EST**, and will be opened in a virtual public setting on **July 11, 2024, at 3:00PM EST** at <https://cohfl.webex.com/>.

Submittals shall be received electronically through OpenGov, and/or hard copy through the City Clerk located at the City of Hollywood, City Hall, 2600 Hollywood Blvd., Room 221, Hollywood, FL 33020. Hard copy submittals shall be sealed and labeled with the solicitation number, name and due date, and shall be submitted as one (1) original, five (5) copies and one (1) electronic copy on a USB drive.

Submittals shall be considered an offer on the part of the bidder/proposer, which offer shall be deemed accepted upon approval of the City, and in case of default, the City reserves the right to accept or reject any or all bids/proposals, to waive irregularities and technicalities, and request new bids/proposals. The City also reserves the right to award any resulting agreement as it deems will best serve the interests of the city.

Submission of a bid/proposal shall serve as prima facie evidence that the Bidder/Proposer has examined this solicitation and is fully aware of all conditions affecting the provision of services and the evaluation criteria and scoring methodology as set forth in this solicitation document.

1.2 **Pre-bid Conference and/or Site Visit (Mandatory/Non-Mandatory)**

There will be a mandatory/non-mandatory pre-bid conference and/or site visit scheduled for this solicitation. Attendance is required if the event is mandatory, and in the event that it is non-mandatory, it is strongly suggested that all Contractors attend the pre-bid conference and/or site visit to receive information that may be critical to their understanding of this solicitation.

Please keep in mind that site visits at other times might not be available. It is the sole responsibility of the Contractor to become familiar with the scope of the City's requirements prior to submitting a bid. No variation in price or conditions shall be permitted based upon a claim of ignorance. Submission of a bid will be considered evidence that the Bidder has familiarized themselves with the nature and extent of the work, equipment, materials, and labor required.

1.3 **OpenGov**

The City of Hollywood uses OpenGov (<https://procurement.opengov.com/portal/hollywoodfl>) to administer the competitive solicitation process, including but not limited to soliciting bids, issuing addenda, posting results and issuing notification of an intended decision.

The City shall not be responsible for a Bidders inability to submit a bid by the bid end date and time for any reason, including issues arising from the use of OpenGov.

1.4 **Point of Contact**

For information concerning procedures for responding to this solicitation, contact the Point of Contact within the Office of Procurement and Contract Compliance, Otis J. Thomas, Senior Purchasing Agent at othomas@hollywoodfl.org or by phone at (954) 921-3224, or Staci Alli, Administrative Assistant I at salli@hollywoodfl.org or by phone at 954-921-3222. Such contact is to be for clarification purposes only. All questions must be submitted in writing via OpenGov by **July 2, 2024, by 3:00 PM EST** in order to receive a response.

Project Manager: Ryan Manalo, P.E., Department of Public Utilities, email: RMANALO@hollywoodfl.org or by phone: (954) 921-3930.

For information concerning technical specifications, please utilize the question / answer feature provided by OpenGov at <https://procurement.opengov.com/portal/hollywoodfl>. Questions of a material nature must be received prior to the cut-off date specified in the solicitation schedule. Material changes, if any, to the scope of services or bidding procedures will only be transmitted by written addendum. (See addendum section of OpenGov Site). Bidders please note: No part of your bid can be submitted via FAX. No variation in price or conditions shall be permitted based upon a claim of ignorance. Submission of a bid will be considered evidence that the Bidder has familiarized themselves with the nature and extent of the work, and the equipment, materials, and labor required. The entire bid response must be submitted in accordance with all specifications contained in this solicitation. The questions and answers submitted in OpenGov shall become part of any contract that is created from this solicitation.

It is the sole responsibility of the Bidder to ensure that their bid is submitted electronically through OpenGov at <https://procurement.opengov.com/portal/hollywoodfl>.

1.5 **Cone of Silence**

The City of Hollywood City Commission adopted Ordinance No. O-2007-05, which created Section 30.15(F) imposing a Cone of Silence for certain City purchases of goods and Services.

The Cone of Silence refers to limits on communications held between vendors and vendor's representatives and City elected officials, management and staff during the period in which a Formal Solicitation is open.

The Ordinance does allow potential vendors or vendor's representatives to communicate with designated employees for the limited purpose of seeking clarification or additional information. The names and contact information of those employees that may be contacted for clarification or additional information are included in the solicitation.

The Cone of Silence does not prohibit a vendor or vendor's representative from communicating verbally, or in writing with the City Manager, the City Manager's designee, the City Attorney or the City Attorney's designee on those procurement items to be considered by the City Commission.

The Cone of Silence does not prohibit a vendor or vendor's representative from making public presentations at a duly noticed pre-bid conference or duly noticed evaluation committee meeting or from communicating with the City Commission during a duly noticed public meeting.

The Cone of Silence shall be imposed when a formal competitive solicitation has been issued and shall remain in effect until an award is made, a contract is approved, or the City Commission takes any other action which ends the solicitation.

To view the Cone of Silence, go to the City of Hollywood Code of Ordinance online, and view [Section 30.15F](#).

All communications regarding this bid should be sent in writing to the The Office of Procurement and Contract Compliance as identified in this bid.

END OF SECTION

SECTION II - SPECIAL TERMS AND CONDITIONS

2.1 **Addenda, Changes, and Interpretations**

It is the sole responsibility of each firm to notify the Point of Contact utilizing the question / answer feature provided by OpenGov and request modification or clarification of any ambiguity, conflict, discrepancy, omission or other error discovered in this competitive solicitation. Requests for clarification, modification, interpretation, or changes must be received prior to the Question and Answer (Q & A) Deadline. Requests received after this date may not be addressed. Questions and requests for information that would not materially affect the scope of services to be performed or the solicitation process will be answered within the question / answer feature provided by OpenGov and shall be for clarification purposes only. Material changes, if any, to the scope of services or the solicitation process will only be transmitted by official written addendum issued by the City and uploaded to OpenGov as a separate addendum to the solicitation. Under no circumstances shall an oral explanation given by any City official, officer, staff, or agent be binding upon the City and should be disregarded. All addenda are a part of the competitive solicitation documents and each firm will be bound by such addenda. It is the responsibility of each to read and comprehend all addenda issued.

2.2 **Dimensions, Quantities and Subsurface Information**

Dimensions, quantities, and subsurface information supplied by the City are in no way warranted to indicate true amounts or conditions. Bidders/Contractors shall neither plead misunderstanding or deception nor make claims against the City if the actual amounts, conditions, or dimensions do not conform to those stated. Any "Outside" reports made available by the Engineer are neither guaranteed as to accuracy or completeness, nor a part of the Contract Documents.

2.3 **Trench Safety Form**

The Trench Safety Form included in the Bid Documents must be completed and signed. Noncompliance with this requirement may invalidate the bid.

2.4 **Changes and Alterations**

Bidder may change or withdraw a Bid at any time prior to Bid submission deadline; however, no oral modifications will be allowed. Modifications shall not be allowed following the Bid deadline.

2.5 **Bidder's Costs**

The City shall not be liable for any costs incurred by Bidders in responding to this solicitation.

2.6 **Pricing/Delivery**

All pricing must include delivery and installation and be quoted FOB: Destination, unless specified otherwise in Section III.

2.7 **Price Validity**

Prices provided in this solicitation shall be valid for at least One-Hundred and Twenty (120) days from time of solicitation opening unless otherwise extended and agreed upon by the City and Bidder.

2.8 **No Exclusive Contract**

Bidder agrees and understands that the contract shall not be construed as an exclusive arrangement and further agrees that the City may, at any time, secure similar or identical services from another vendor at the City's sole option.

2.9 Responsive

In order to be considered responsive to the solicitation, the firm's bid shall fully conform in all material respects to the solicitation and all of its requirements, including all form and substance.

2.10 Responsible

In order to be considered as a responsible firm, firm shall be fully capable to meet all of the requirements of the solicitation and subsequent contract, must possess the full capability, including financial and technical, to perform as contractually required, and must be able to fully document the ability to provide good faith performance.

2.11 Minimum Qualifications

To be eligible for award of a contract in response to this solicitation, the Bidder must demonstrate that they have successfully completed services, as specified in Section III of this solicitation, are normally and routinely engaged in performing such services, and are properly and legally licensed (if required) to perform such work. Bidder must possess, and be able to provide the City with any and all required Federal, State, County and/or municipal licenses, and occupational licenses. Bidder must be able to provide proof of valid licensing for all subcontractors and/or material suppliers hired by the contractor, if requested. In addition, the Bidder must have no conflict of interest with regard to any other work performed by the Bidder for the City.

2.12 Award of Contract

Award may be in the aggregate, or by line item, or by group, whichever is determined to be in the best interest of the City.

The Contract will be awarded only to a Bidder, who in the opinion of the **Engineer**, is fully qualified to undertake the work, quoting the lowest price, for that product/service that will best serve the needs of the City. The City reserves the right before awarding the Contract to require a Bidder to submit such evidence of his qualifications as it may deem necessary and may consider any available evidence of his financial status, technical qualifications, and other qualifications and abilities.

The City also reserves the right to accept or reject any or all bids, part of bids, and to waive minor irregularities or variations to specifications contained in bids, and minor irregularities in the bidding process. The City also reserves the right to award the contract on a split order basis, lump sum basis, individual item basis, or such combination as shall best serve the interest of the City.

2.13 Execution Of Contract

The Bidder to whom the Contract is awarded shall, within ten days of the date of award, execute and deliver three (3) copies of the following to the Engineer.

- A. The Contract
- B. Performance and Payment Bond
- C. Evidence of required Insurance
- D. Proof of authority to execute the Contract
- E. Proof of authority to execute the Bond on behalf of the Awardee
- F. List of Subcontractors, estimated Contract Value for each and proof that such subcontractors possess all required Federal, State, County and/or municipality licenses, including but not limited to certified of competency and occupational license

The above documents must be furnished, executed and delivered before the Contract will be

executed by the City. The Contract shall not be binding upon the City until it has been executed by the City and a copy of such fully executed Contract is delivered to the Contractor.

2.14 Failure To Execute Contract, Bid Guaranty Forfeited

Should the Bidder to whom the Contract has been awarded refuse or fail to complete the requirements of Section 2.13 above within ten (10) days after Notice of Award, the additional time in days (including weekends) required to CORRECTLY complete the documents will be deducted, in equal amount, from the Contract Time, or the City may elect to revoke the Award. The Bid Guaranty of any Bidder failing to execute the awarded Contract shall be retained by the City and the Contract awarded as the Commission desires.

2.15 Manufacturer/Brand/Model Specific Request

This is a manufacturer/brand/model specification. No substitutions will be allowed unless specified in Form 3 or Attachment D, – Technical Specifications.

2.16 Permits and Fees Refer to Attachment D – Technical Specifications (Section 01025 Basis of Payment)

2.17 Contract Security

When the awarded bidder delivers the executed contract to the City, it must be accompanied by the required bonds.

2.18 Contract Period

The initial contract term shall commence upon date of award by the City for a total of 615 calendar days (to substantial completion) term. The City reserves the right to renew the contract providing all terms, conditions and specifications remain the same, both parties agree to the renewal, and such renewal is approved by the City. In the event services are scheduled to end because of the expiration of this contract, the Contractor shall continue the service upon the request of the City as authorized by the awarding authority. The extension period shall not extend for more than 120 days beyond the expiration date of the existing contract. The Contractor shall be compensated for the service at the rate in effect when this extension clause is invoked by the City.

2.19 Bid Guaranty

A Bid Guaranty in the form of a Cashier's Check, Certified Check or Bid Bond executed by the Bidder and a qualified Surety in the amount of 5% of the Bid is required for this project.

2.20 Warranties of Usage

Any estimated quantities listed are for information and tabulation purposes only. No warranty or guarantee of quantities needed is given or implied. It is understood that the Contractor will furnish the City's needs as they arise.

2.21 Rules and Submittals of Bids

The signer of the bid must declare that the only person(s), company or parties interested in the proposal as principals are named therein; that the bid is made without collusion with any other person(s), company or parties submitting a bid; that it is in all respects fair and in good faith, without collusion or fraud; and that the signer of the bid has full authority to bind the principal bidder.

2.22 Tie Breaker

In cases where there is a tie for the bid award, the award shall be made by giving preference to the low bidder(s) with the following items (in this order): (1) maintenance of a drug-free workplace in

accordance with the requirements of Florida Statutes Section 287.087, (2) local Hollywood vendor preference, (3) closest proximity/location to project site or City Hall, and/or (4) minority-owned or disadvantaged business status. If a tie still exists after the aforementioned tiebreakers are utilized, the Chief Procurement Officer will make a recommendation for award among the tied bidders.

2.23 Conflict of Interests Prohibited

Any respondent submitting a response to this solicitation is responsible for being aware of, and complying with [Section 34.02](#) of the City Code of Ordinances. If you have questions concerning whether you may or may not need to comply with the ordinance, please contact the City of Hollywood, City Clerk's Office at 954-921-3211.

2.24 Protest Procedure

Any respondent who is not recommended for award of a contract and who alleges a failure by the City to follow the City's [Procurement Code](#) or any applicable law may protest to the CPO, by delivering a letter of protest to the CPO in accordance with [Section 38.52](#) of the City's [Procurement Code](#) within five days after a notice of intent to award is posted on the City's web site, [OPENGOV](#), City Clerk's Office, Open Government, and/or City's Sunshine Board (<https://www.hollywoodfl.org/Archive.aspx?AMID=140>).

2.25 Insurance Requirements

Contractor shall maintain, at its sole expense, during the term of this agreement the following insurances:

The insurance required by Article 5.6 of the General Conditions shall be as follows:

Any Sub-Contractor used by the contractor shall supply such similar insurance required of the contractor. Such certificates shall name the City of Hollywood as an Additional Insured.

1. BUILDERS RISK (BR 1) - Installation Floater: (Not Applicable)

2. GENERAL LIABILITY (GL3):

Prior to the commencement of work governed by this contract, the Contractor shall obtain General Liability Insurance. Coverage shall be maintained throughout the life of the contract and include, as a minimum:

- Premises Operations
- Products and Completed Operations
- Blanket Contractual Liability
- Personal Injury Liability
- Expanded Definition of Property Damage

The minimum limits acceptable shall be:

- \$2,000,000 Combined Single Limit (CSL)

An Occurrence Form policy is preferred. If coverage is provided on a Claims Made policy, its provisions should include coverage for claims filed on or after the effective date of this contract. In addition, the period for which claims may be reported should extend for a minimum of twelve (12) months following the acceptance of work by the City.

The City of Hollywood shall be named as Additional Insured on all policies issued to satisfy the above requirements.

3. GENERAL LIABILITY (GLXCU):

Recognizing that the work governed by this contract involves either underground exposures, explosive activities, or the possibility of collapse of a structure, the Contractor's General Liability Policy shall include coverage for the XCU (explosion, collapse, and underground) exposures with limits of liability equal to those of the General Liability Insurance policy.

4. VEHICLE LIABILITY (VL3):

Recognizing that the work governed by this contract requires the use of vehicles, the Contractor, prior to the commencement of work, shall obtain Vehicle Liability Insurance. Coverage shall be maintained throughout the life of the contract and include, as a minimum, liability coverage for:

Owned, Non-Owned, and Hired Vehicles The minimum limits acceptable shall be:
\$1,000,000 Combined Single Limit (CSL)

The City of Hollywood shall be named as Additional Insured on all policies issued to satisfy the above requirements.

5. WORKERS' COMPENSATION (WC2):

Prior to the commencement of work governed by this contract, the Contractor shall obtain Workers' Compensation Insurance with limits sufficient to respond to the applicable state statutes.

In addition, the Contractor shall obtain Employers' Liability Insurance with limits of not less than:

\$1,000,000 Bodily Injury by Accident
\$1,000,000 Bodily Injury by Disease, policy limits
\$1,000,000 Bodily Injury by Disease, each employee

Coverage shall be maintained throughout the entire term of the contract.

6. POLLUTION LIABILITY INSURANCE

The minimum limits of liability shall be:

\$1,000,000 per each claim / \$2,000,000 aggregate

Coverage shall be provided by a company or companies authorized to transact business in the state of Florida and the company or companies must maintain a minimum rating of "A" and Class X, as assigned by the A.M. Best Company.

The policy must be endorsed to provide the City with (30) days' notice of cancellation.

If the Contractor has been approved by the Florida's Department of Labor, as an authorized self-insurer, the City shall recognize and honor the Contractor's status. The Contractor may be required to submit a Letter of Authorization issued by the Department of Labor and a Certificate of Insurance, providing details on the Contractor's Excess Insurance Program.

If the Contractor participates in a self-insurance fund, a Certificate of Insurance will be required. In addition, the Contractor may be required to submit updated financial statements from the fund upon request from the City.

Any sub-consultant shall supply such similar insurance required of the Consultant. Such certificates shall name the City as additional insured in the general liability and auto liability policies.

The City of Hollywood needs to be the certificate holder as per the following format:

City of Hollywood
1621 N. 14 Ave. Hollywood Blvd
Hollywood, FL 33022

2.26 Uncontrollable Circumstances (Force Majeure)

The City and Contractor will be excused from the performance of their respective obligations under this agreement when and to the extent that their performance is delayed or prevented by any circumstances beyond their control including, fire, flood, explosion, strikes or other labor disputes, acts of God or public emergency, war, riot, civil commotion, malicious damage, act or omission of any governmental authority, delay or failure or shortage of any type of transportation, equipment, or service from a public utility needed for their performance, provided that:

2.26.1 The non performing party gives the other party prompt written notice describing the particulars of the Force Majeure including, but not limited to, the nature of the occurrence and its expected duration, and continues to furnish timely reports with respect thereto during the period of the Force Majeure;

2.26.2 The excuse of performance is of no greater scope and of no longer duration than is required by the Force Majeure; and

2.26.3 No obligations of either party that arose before the Force Majeure causing the excuse of performance are excused as a result of the Force Majeure; and

2.26.4 The non-performing party uses its best efforts to remedy its inability to perform. Notwithstanding the above, performance shall not be excused under this Section for a period in excess of two (2) months, provided that in extenuating circumstances, the City may excuse performance for a longer term. Economic hardship of the Contractor will not constitute Force Majeure. The term of the agreement shall be extended by a period equal to that during which either party's performance is suspended under this Section.

2.27 Supplier Portal (Oracle) Payment Method

The City has implemented software that contains a supplier portal allowing suppliers to submit and update their information via the supplier portal. New suppliers will be required to register; and current suppliers will need to confirm and update their information.

Firms are responsible for ensuring that all contact, payment, and general information is updated at all times, and will not hold the City liable for any inaccurate information.

2.28 Debarred or Suspended Bidders or Proposers

Firm(s) certifies, by submission of a response to this solicitation, that neither it nor its principals and subcontractors are presently debarred or suspended by any federal, state, county or municipal

department or agency.

2.29 Payment and Performance Bond

A Performance Bond and a Payment Bond each equal to 100 percent of the total Bid will be required of the Awardee. The Bond must be written through a company licensed to do business in the State of Florida and be rated at least "A", Class X, in the latest edition of "Best's Key Rating Guide", published by A.M. Best Company. As per Florida Statute Section 255.05, the Contractor shall be required to record the payment and performance bonds in the public records of Broward County

2.30 Public Records

A. Public Records/Trade Secrets/Copyright:

All responses will become the property of the City. The Consultant's response to the solicitation is a public record pursuant to Florida law and is subject to disclosure by the City pursuant to Chapter 119.07, Florida Statutes ("Public Records law"). The City shall permit public access to all documents, papers, letters or other material submitted in connection with this solicitation and the Contract to be executed for this solicitation, subject to the provisions of Chapter 119, Florida Statutes.

Any language contained in the Consultant's response to the solicitation purporting to require confidentiality of any portion of the Consultant's response to the solicitation, except to the extent that certain information is in the City's opinion a Trade Secret pursuant to Florida law, shall be void. If a Consultant submits any documents or other information to the City that the Consultant claims is Trade Secret information and exempt from Florida Statutes Chapter 119.07 ("Public Records Laws"), the Consultant shall clearly designate that it is a Trade Secret and that it is asserting that the document or information is exempt. The Consultant must specifically identify the exemption being claimed under Florida Statutes 119.07. The City shall be the final arbiter of whether any information contained in the Consultant's response to the solicitation constitutes a Trade Secret. The City's determination of whether an exemption applies shall be final, and the Consultant agrees to defend, indemnify, and hold harmless the City and the City's officers, employees, and agent, against any loss or damages incurred by any person or entity as a result of the City's treatment of records as public records. In the event of Contract award, all documentation produced as part of the Contract shall become the exclusive property of the City. Proposals purporting to be subject to copyright protection in full or in part will be rejected.

EXCEPT FOR CLEARLY MARKED PORTIONS THAT ARE BONA FIDE TRADE SECRETS PURSUANT TO FLORIDA LAW, DO NOT MARK YOUR RESPONSE TO THE SOLICITATION AS PROPRIETARY OR CONFIDENTIAL. DO NOT MARK YOUR RESPONSE TO THE SOLICITATION OR ANY PART THEREOF AS COPYRIGHTED.

B. PUBLIC RECORDS GENERAL

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: (954-921-3211), pcerny@hollywoodfl.org, CITY CLERK'S OFFICE, 2600 HOLLYWOOD BLVD, HOLLYWOOD, FLORIDA 33020)

Consultant shall:

1. Keep and maintain public records that ordinarily and necessarily would be 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 the 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.
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 contract term and following completion of this contract 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 this 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 this 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. It is solely and exclusively the Contractor's responsibility to familiarize itself with Chapter 119, Florida Statutes, and to ensure compliance with its requirements.

2.31 Local Preference

When the lowest responsive responsible bidder is a non-Hollywood business and a responsive responsible local Hollywood vendor's Bid is within 5% of the Bid submitted by the lowest responsive responsible bidder, the local vendor is allowed to submit a second Bid. The second bid from the local Hollywood bidder must be lower than the bid submitted by the lowest responsive and responsible non-Hollywood bidder by at least 1% in order for the bid to be awarded to the local Hollywood bidder. If more than one responsive and responsible local Hollywood vendor is within 5%, each would be permitted to submit a best and final offer and the local Hollywood vendor submitting the lowest bid will be awarded the contract; provided, however, if none of the local Hollywood vendors bids are lower than the lowest responsive and responsible non-Hollywood bidder by at least 1%, the non- Hollywood bidder will be awarded the contract.

END OF SECTION

SECTION III - SCOPE OF SERVICES

3.1 Project Description

It is the intent of the CITY to obtain a complete and working installation under this contract and any items of labor, materials or equipment, which may reasonably be assumed as necessary to accomplish this end, should be supplied whether or not specifically shown on the plans or described herein. The following components comprise the major project elements:

1. General Requirements of the Contract, including mobilization/demobilization, bonds, insurance, contract administration, scheduling and coordination, preparation and approval of submittals, provision of Operation and Maintenance (O&M) data, OWNER training, and specified testing and warranty services.
2. Furnishing and installation of replacement membrane pressure vessels for the City's seven 2.0 million gallon per day (mgd) NF units. Each NF unit has three stages in a 32:16:6 array (54 pressure vessels per unit, or 378 pressure vessels total).
3. Furnishing and installation of replacement nanofiltration membrane elements for the City's seven NF units. Each pressure vessel houses seven NF elements except for the six third-stage vessels which contain two spacers each. Each NF unit has 366 elements, or 2,562 total elements for the seven units. 21 additional elements shall also be furnished to the City for future pilot testing (2,583 elements total).
4. Removal and disposal of the existing pressure vessels and membrane elements. The existing pressure vessels, membrane elements, and old accessories being replaced shall become the property of the CONTRACTOR upon removal from the membrane units, and shall be removed from the site and disposed of at the CONTRACTOR's expense.
5. Disinfecting and bacteriologically clearing through the Florida Department of Environmental Protection (FDEP) the membrane units and preparation for loading of the new membrane elements. The Engineer will be responsible for preparation and submittal of the necessary documentation for bacteriological clearance. The CONTRACTOR is responsible for proper disinfection and for achieving clear bacteriological sample results.
6. Loading of new membrane elements in the membrane element pressure vessels.
7. Supplying and installing specified parts that require replacement during the unloading/loading process.
8. Start-up and leak testing of the membrane units upon completion of loading.
9. Correcting any defects associated with the membrane element installation.
10. Completion of a seven-day membrane performance test for each of the membrane units.
11. Completion of specified membrane system training, O&M Manuals, and all punchlist work.
12. During the course of the work, the CONTRACTOR shall properly dispose of approximately 95 existing standard-size spare membrane elements and spacers currently stored in three palletized crates (25 elements each) and three pallets containing non-crated membrane elements and spacers. This is in addition to the requirement that the CONTRACTOR properly dispose of all existing pressure vessels and membrane elements to be replaced under this project.

3.2 Technical Specifications

Refer to Appendix D.

3.3 Contractor Qualifications

The contract will be awarded only to a responsive contractor qualified by experience to do the Work specified. The bidder shall submit, prior to award of contract, satisfactory evidence of his experience in like Work and that he is fully prepared with the necessary organization, capital, equipment and machinery to complete the Work to the satisfaction of the City within the time limit stated. In addition to the above, the Contractor shall satisfy the following criteria:

- Contractor with a project manager with an experience of five (5) years in similar projects (3 projects minimum).

Form 15 – Information Required from Bidders, shall be completed fully and accurately by the Contractor and submitted with the bid. Information included on the questionnaire will be used in evaluating the qualifications of the Contractor. The City reserves the right to request additional information not identified on the questionnaire.

3.4 Subcontractors

For the City to be assured that only competent and qualified subcontractors will be employed on this project, each Bidder shall submit in the bid a list of the subcontractors performing work on this project. This subcontractors list shall include each firm's name, address, telephone number, contact person and work to be performed. Subcontractors shall be properly registered or licensed with the State of Florida, Broward County and the City of Hollywood. Subcontractors shall, in the City's opinion, be qualified both technically and financially to perform the work.

The City reserves the right to reject any subcontractor who is deemed by the City to be unacceptable technically or financially, or has previously performed work which the City believes to be unsatisfactory. No change may be made to this list of subcontractors by the Contractor, before or after contract award, without the express written consent of the City.

If, prior to award, the City rejects any subcontractor, the Contractor shall be afforded the opportunity to submit qualifications for an alternate subcontractor with no attendant increase in the base lump sum bid amount, adjustment of contract time or alteration of the bid documents. Such qualifications will be due within ten (10) days of receipt of notification of subcontractor rejection. Failure to submit an acceptable alternate subcontractor may result in rejection of the bid. In this event, the bid bond shall be returned to Contractor without claim by the City and with forfeiture of all claim rights by the Contractor.

3.5 Deliverables and Objectives

Refer to Attachment B General Conditions, Attachment C Supplementary General Conditions, Attachment D Technical Specifications and Drawings.

3.6 Project Schedule / Timeline

Refer to Appendix C, Supplementary conditions, Section 1, Project Schedule.

3.7 Questions

Refer to Form 15, Information Required from Bidders.

3.8 Substantial Completion

Refer to Appendix C, Supplementary conditions, Section 1, Project Schedule.

END OF SECTION

SECTION IV – GENERAL TERMS AND CONDITIONS

1.1 INTENT

It is the policy of the City to encourage full and open competition among all available qualified vendors. All vendors regularly engaged in the type of Work specified in the Bid Solicitation are encouraged to submit bids. To receive notification and to be eligible to bid vendor should be registered with OpenGov. Vendors may register with the OpenGov (registration is free) to be included on a mailing list for selected categories of goods and Services. In order to be processed for payment, any awarded vendor must register with the City by completing and returning a Vendor Application and all supporting documents. For information and to apply as a vendor, please visit our website at hollywoodfl.org to download an application and submit it to the Office of Procurement and Contract Compliance.

It is the intent of the City of Hollywood, FL (“the City”), through this solicitation and the contract conditions contained herein, to establish to the greatest possible extent complete clarity regarding the requirements of both parties to the agreement resulting from this solicitation.

Before submitting a bid, the Vendor shall be thoroughly familiarized with all contract conditions referred to in this document and any addenda issued before the bid/proposal submission date. Such addenda shall form a part of the SOLICITATION and shall be made a part of the contract. It shall be the Vendor's responsibility to ascertain that the bid/proposal includes all addenda issued prior to the bid/proposal submission date. Addenda will be posted on the City's internet site along with the SOLICITATION.

The terms of the SOLICITATION and the selected Vendor's bid and any additional documentation (e.g. questions and answers) provided by the Vendor during the solicitation process will be integrated into the final contract for services entered into between the City and the selected Vendor. The Vendor shall determine, by personal examination and by such other means as may be preferred, the conditions and requirements under which the agreement must be performed.

1.2 PROPOSER'S RESPONSIBILITIES

Proposers are required to submit their bids upon the following express conditions:

- A. Proposers shall thoroughly examine the drawings, specifications, schedules, instructions and all other contract documents.
- B. Proposers shall make all investigations necessary to thoroughly inform themselves regarding delivery of material, equipment or services as required by the SOLICITATION conditions. No plea of ignorance, by the proposer, of conditions that exist or that may hereafter exist as a result of failure or omission on the part of the proposer to make the necessary examinations and investigations, or failure to fulfill in every detail the requirements of the contract documents, will be accepted as a basis for varying the requirements of the City or the compensation due the proposer.
- C. Proposers are advised that all City contracts are subject to all legal requirements provided for in the City of Hollywood Charter, Code of Ordinances and applicable County Ordinances, State Statutes and Federal Statutes.

1.3 PREPARATION OF BIDS/PROPOSALS

Bids/proposals shall be prepared in accordance with the bid/proposal response format. Bids/proposals not complying with this format may be considered non-responsive and may be removed from consideration on this basis. Each proposer, by making a bid/proposal, represents that this document has been read and is fully understood.

Bids/proposals will be prepared in accordance with the following:

- A. The City's enclosed bid/proposal Forms, in their entirety, are to be used in submitting your bid/proposal. **NO OTHER FORM WILL BE ACCEPTED.**
- B. All information required by the bid/proposal form shall be furnished. The proposer shall sign each continuation sheet (where indicated) on which an entry is made.

C. Prices shall be shown and where there is an error in extension of prices, the unit price shall govern.

The City of Hollywood is exempt from payment to its vendors of State of Florida sales tax and, therefore, such taxes should not be figured into the SOLICITATION. However, this exemption does not apply to suppliers to the City in their (supplier) purchases of goods or services, used in work or goods supplied to the City. Proposers are responsible for any taxes, sales or otherwise, levied on their purchases, subcontracts, employment, etc. An exemption certificate will be signed where applicable, upon request. The City will pay no sales tax.

1.4 DESCRIPTION OF SUPPLIES (As Applicable)

Any manufacturer's names, trade names, brand names, or catalog numbers used in these applications are for the purpose of describing and establishing minimum requirements or level of quality, standards of performance, and design required, and are in no way intended to prohibit the bidding of other manufacturers' items of equal material, unless specifications state "NO SUBSTITUTIONS."

Proposers must indicate any variances to the specifications, terms, and conditions, no matter how slight. If variations are not stated in the bid/proposal, it shall be construed that the bid/proposal fully complies with the Specifications, Terms and Conditions.

Proposers are required to state exactly what they intend to furnish; otherwise they shall be required to furnish the items as specified.

Proposers will submit, with their bid/proposal, necessary data (factory information sheets, specifications, brochures, etc.) to evaluate and determine the quality of the item(s) they are proposing.

The City shall be the sole judge of equality and its decision shall be final.

1.5 ADDENDA

The The Office of Procurement and Contract Compliance may issue an addendum in response to any inquiry received, prior to bid/proposal opening, which changes, adds to or clarifies the terms, provisions or requirements of the solicitation. The Proposer should not rely on any representation, statement or explanation, whether written or verbal, other than those made in this solicitation document or in any addenda issued. Where there appears to be a conflict between this solicitation and any addendum, the last addendum issued shall prevail. It is the proposer's responsibility to ensure receipt of all addenda and any accompanying documents. Proposer(s) shall acknowledge receipt of any formal Addenda by signing the addendum and including it with their bid/proposal. Failure to include signed formal addenda in its bid/proposal shall cause the City to deem the bid/proposal non-responsive provided, however, that the City may waive this requirement in its best interest.

1.6 REJECTION OF BIDS/PROPOSALS

To the extent permitted by applicable state and federal laws and regulations, the City reserves the right to reject any and all bids/proposals, to waive any and all informalities, irregularities and technicalities not involving price, time or changes in the commodities and/or services, and the right to disregard all nonconforming, non-responsive, unbalanced or conditional bids/proposals. Bids/proposals will be considered irregular and may be rejected if they show serious omissions, alterations in form, additions not called for, conditions or unauthorized alterations or irregularities of any kind.

The City also reserves the right to waive minor technical defects in a bid/proposal. The City reserves the right to determine, in its sole discretion, whether any aspect of a bid/proposal satisfies the criteria established in this Solicitation.

The City reserves the right to reject, in whole or in part, the bid/proposal of any Proposer if the City believes that it would not be in the best interest of the City to make an award to that Proposer, whether because the bid/proposal is not responsive or the Proposer is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criterion established by City.

The foregoing reasons for rejection of bids/proposals are not intended to be exhaustive.

The City may reject a bid/proposal if:

A. The Proposer fails to acknowledge receipt of an addendum, or if

- B. The Proposer misstates or conceals any material fact in the bid/proposal, or if
- C. The bid/proposal does not strictly conform to the law or requirements of the SOLICITATION, or if
- D. The City is under a pre- lawsuit claim or current litigation with the proposer.

Additionally, any one of the following causes (not limited to) may be considered as sufficient justification to disqualify a Bidder and reject his/her Bid:

- A. Submission of more than one Bid for the same work by an individual, firm, partnership or corporation under the same or different names.
- B. Evidence of collusion.
- C. Previous participation in collusive Bidding on work for the City of Hollywood, Florida.
- D. Submission of an unbalanced Bid in which the prices Bid for some items are out of proportion to the prices Bid for other items.
- E. Lack of competency. The Engineer may declare any Bidder ineligible, at any time during the process or receiving Bids or awarding the Contract, if developments arise which, in his opinion, adversely affects the Bidder's responsibility. The Bidder will be given an opportunity, by the Engineer, to present additional evidence before final action is taken.
- F. Lack of responsibility as shown by past work judged by the Engineer from the standpoint of workmanship and progress.
- G. Uncompleted work for which the Bidder is committed by Contract, which is in the judgment of the Engineer, might hinder or prevent the prompt completion of work under this Contract

The City may reject all bids whenever it is deemed in the best interest of the City to do so, and may reject any part of a bid unless the bid has been qualified as provided in herein.

1.7 WITHDRAWAL OF BIDS

- A. Bids may not be withdrawn and shall be deemed enforceable for a period of 180 days after the time set for the SOLICITATION opening.
- B. Bids may be withdrawn prior to the time set for the SOLICITATION opening. Such request must be in writing.
- C. The City will permanently retain as liquidated damages and the bid deposit furnished by any Bidder who requests to withdraw a bid after the SOLICITATION opening.

1.8 BIDS TO REMAIN OPEN

All bids shall remain open for 180 calendar days after the day of the bid opening, but the City may, at its sole discretion, release any bid and return the bid Security prior to that date.

Extensions of time when bids shall remain open beyond the 180 day period may be made only by mutual written agreement between the City, the successful Bidder and the surety, if any, for the successful Bidder.

1.9 LATE BIDS OR MODIFICATIONS

Only bids received as of the opening date and time will be considered timely. Bids and modifications received after the time set for the opening will be returned un-opened to the sender and rejected as late.

1.10 CONFLICTS WITHIN THE SOLICITATION

Where there appears to be a conflict between the General Terms and Conditions, Special Conditions, the Technical Specifications, the SOLICITATION Submittal Section, or any addendum issued, the order of precedence shall be the last addendum issued, the SOLICITATION Submittal Section, the Technical Specifications, the Special Conditions, and then the General Terms and Conditions.

1.11 CLARIFICATION OR OBJECTION TO BID SPECIFICATIONS

If any person contemplating submitting a bid for this contract is in doubt as to the true meaning of the specifications or other SOLICITATION documents or any part thereof, they may submit requests for clarification to the The Office of Procurement and Contract Compliance on or before the date specified for a request for clarification. All such requests for clarification shall be made in writing and the person submitting the request will be responsible for its prompt delivery. Any interpretation of the SOLICITATION, if made, will be made only by Addendum duly issued. A copy of such Addendum will be made available to each person receiving a Solicitation. The City will not be responsible for any other explanation or interpretation of the SOLICITATION given prior to the award of the contract. Any objection to the specifications and requirements as set forth in this SOLICITATION must be filed in writing with the Chief Procurement Officer on or before the date specified for a request for clarification.

1.12 COMPETENCY OF PROPOSERS

Pre-award inspection of the Bidder's facility may be made prior to the award of a contract. Bids will be considered only from firms which are regularly engaged in the business of providing the goods and/or services as described in this SOLICITATION(s); have a record of performance for a reasonable period of time; and have sufficient financial support, equipment and organization to ensure that they can satisfactorily deliver the material and/or services if awarded a Contract under the terms and conditions herein stated. The terms "equipment and organization" as used herein shall be construed to mean a fully equipped and well established company in line with the best business practices in the industry and as determined by the proper authorities of the City.

The City may consider any evidence available to it of the financial, technical and other qualifications and abilities of a proposer, including past performance (experience) in making the award in the best interest of the City. In all cases the City of Hollywood shall have no liability to any proposer for any costs or expense incurred in connection with this SOLICITATION or otherwise.

1.13 QUALIFICATIONS OF PROPOSERS

No Bid will be accepted from, nor will any contract be awarded to any person who is in arrears to the City upon any debt or contract, or who is a defaulter, as surety or otherwise, upon any obligation to City, or who is deemed responsible or unreliable by the City.

As part of the bid evaluation process, City may conduct a background investigation including a record check by the Hollywood Police Department. Proposer's submission of a bid constitutes acknowledgment of the process and consent to such investigation. City shall be the sole judge in determining a Bidder's qualifications.

1.14 CONSIDERATION OF BIDS

In cases where an item requested is identified by a manufacturer's name, trade name, catalog number, or reference, it is understood that the Vendor proposes to furnish the item so identified and does not propose to furnish an "equal" unless the proposed "equal" is pre-approved by the City.

References to any of the above are intended to be descriptive but not restrictive and only indicate articles that will be satisfactory. A bid of an "equal" will be considered, provided that the Vendor states in his bid exactly what he proposes to furnish, including sample, illustration, or other descriptive matter which will clearly indicate the character of the article covered by such bid. The designated City representative hereby reserves the right to approve as an "equal", or to reject as not being an "equal", any article proposed which contains major or minor variations from specifications requirements.

1.15 AWARD OF CONTRACT

If the Contract is to be awarded, it will be awarded, after evaluation by the City, to the responsible and responsive Proposer whom the City determines will be in the best interests of the City and not necessarily to the lowest cost Proposer. Proposers may be invited to an oral interview before the committee. A short list of finalists will be determined and presented to either the City Manager or his/her designee or to the City Commission, in accordance with the applicable City of Hollywood Code of Ordinances, and will make the final ranking for the purposes of negotiating a contract with the top ranked firm. The successful Proposer shall be required to sign a negotiated contract; the refusal or failure of a successful Proposer to execute a contract which contains the mandatory material terms and conditions contained in the SOLICITATION, shall be grounds for deeming the Proposer and/or the Proposer's bid/proposal non-responsive.

If applicable, the Proposer to whom award is made shall execute a written contract prior to award by the City Commission. If the Proposer to whom the first award is made fails to enter into a contract as herein provided, the Contract may be let to the next highest ranked Proposer who is responsible and responsive in the opinion of the City.

1.16 BASIS FOR AWARD, EVALUATION CRITERIA AND QUESTIONS

The qualification of bid/proposal responders on this project will be considered in making the award. The City is not obligated to accept any bid/proposal if deemed not in the best interest of the City to do so. The City shall make award to a qualified proposer based on fees submitted and responses to this SOLICITATION.

Failure to include in the bid all information outlined herein may be cause for rejection of the bid.

The City reserves the right to accept or reject any and all bids, in whole or in part, as determined to be in the best interest of the City in its sole discretion.

The City reserves the right to waive any informalities or irregularities in bids.

The City reserves the right to negotiate separately the terms and conditions or all or any part of the bids as deemed to be in the City's best interest in its sole discretion.

Information and/or factors gathered during interviews, negotiations and any reference checks, and any other information or factors deemed relevant by the City, shall be utilized in the final award. The final award of a contract is subject to approval by the City Commission.

1.17 AGREEMENT

An agreement shall be sent to the awarded proposer to be signed, witnessed, and returned to the City for execution. The City will provide a copy of the fully executed agreement to the awarded proposer.

1.18 NOTICE TO PROCEED

A signed purchase order, blanket purchase order or fully executed agreement will be the Proposer's authorization to proceed and may substitute for a "Notice to Proceed" form.

1.19 BID PROTESTS

The City shall provide notice of its intent to award or reject to all Proposers by posting such notice on the City's website.

After a notice of intent to award a contract is posted, any actual or prospective proposer who is aggrieved in connection with the pending award of the contract or any element of the process leading to the award of the contract may protest to the Director of Procurement Services. A protest must be filed within five business days after posting or any right to protest is forfeited. The protest must be in writing, must identify the name and address of the protester, and must include a factual summary of, and the basis for, the protest. Filing shall be considered complete when the protest, including a deposit, is received by the The Office of Procurement and Contract Compliance. Failure to file a protest within the time-frame specified herein shall constitute a full waiver of all rights to protest the City's decision regarding the award.

The written protest shall state in detail the specific facts and law or ordinance upon which the protest of the proposed award is based, and shall include all pertinent documents.

A written protest may not challenge the relative weight of evaluation criteria or a formula for assigning points.

Upon receipt of a formal written protest, the City shall stop award proceedings until resolution of the protest; unless it has been determined that the award of the contract without delay is necessary to protect substantial interests of the City.

Any and all costs incurred by a protesting party in connection with a bid protest shall be the sole responsibility of the protesting party.

Upon receipt of a protest of the pending award of a contract, a copy of the protest shall promptly be forwarded to the City Attorney. The City Attorney shall thereupon review the charge to determine its sufficiency, including whether the protest was timely filed. If upon review the City Attorney determines that the charge is insufficient, the City Attorney may issue a

summary dismissal of the protest. If upon review the City Attorney determines that the charge is sufficient, a hearing of the protest committee shall be scheduled.

A protest committee shall have the authority to review, settle and resolve the protest. The committee shall consist of three members appointed by the City Manager. The committee's review shall be informal.

If the protest committee determines that the pending award of a contract or any element of the process leading to the award involved a significant violation of law or applicable rule or regulation, all steps necessary and proper to correct the violation shall be taken. If the committee determines that the protest is without merit,

The Director shall promptly issue a decision in writing stating the reason for the decision and furnish a copy to the protester and any other interested party, and the process leading to the award shall proceed.

1.20 REQUIREMENTS FOR SIGNING BIDS/PROPOSALS

Requirements for Signing Bid/Proposal:

- A. The bid/proposal must be signed in ink by an individual authorized to legally bind the person, partnership, company, or corporation submitting the bid/proposal. In cases where the bid/proposal is signed by a deputy or subordinate, the principal's proper written grant of authority to such deputy or subordinate must accompany the bid/proposal.
- B. Bids/proposals by corporations must be executed in the corporate name by the President or other corporate officers accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown below the signature.
- C. Bids/proposals by partnerships must be executed in the partnership name and signed by a general partner whose title must appear under the signature and the official address of the partnership must be shown below the signature.
- D. All manual signatures must have the name typed directly under the line of the signature
- E. The above requirements apply to all SOLICITATION addenda.

1.21 EXAMINATION OF BID DOCUMENTS

Before submitting a bid, each Bidder must: examine the bid Documents thoroughly; consider federal, state and local laws, ordinances, rules and regulations that may in any manner affect cost, progress, performance, or provision of the commodities and/or services; study and carefully correlate Proposer's observations with the bid Documents, and notify the City's agent of all conflicts, errors and discrepancies in the bid Documents.

The submission of a bid/proposal will constitute an incontrovertible representation by the Bidder, that the Bidder has complied with every requirement of this SOLICITATION, that without exception, the bid is premised upon performing the services and/or furnishing the commodities and materials in accordance with such means, methods, techniques, sequences or procedures as may be indicated in or required by the bid/proposal Documents, and that the bid Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions of performance and furnishing of the goods and/or services.

1.22 PUBLIC RECORDS LAW

If applicable, for each public agency contract for services, the Proposer is required to comply with F.S. 119.0701, which includes the following:

- A. Keep and maintain public records that ordinarily and necessarily would be required by the public agency in order to perform the service.
- B. Provide the public with access to public records on the same terms and conditions that the public agency would provide the records and at a cost that does not exceed the cost provided in F.S. Chapter 119 or as otherwise provided by law.

- C. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law.
- D. Meet all requirements for retaining public records and transfer, at no cost, to the public agency, all public records in possession of the proposer upon termination of the contract and destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. All records stored electronically must be provided to the public agency in a format that is compatible with the information technology systems of the public agency.

Public records may be inspected and examined by anyone desiring to do so, at a reasonable time, under reasonable conditions, and under supervision by the custodian of the public record. Sealed Bids become subject to the public records disclosure requirements of F.S. Chapter 119, notwithstanding a proposers' request to the contrary, at the time the City provides notice of a decision or intended decision, or 30 days after the bid/proposal opening, whichever is earlier.

Financial statements submitted in response to a request by the City may be confidential and exempt from disclosure.

Data processing software obtained under a licensing agreement which prohibits its disclosure may also exempt.

Proposers are hereby notified and agree that all information submitted as part of, or in support of SOLICITATION submittals will be available for public inspection after opening of SOLICITATION in compliance with Chapter 119 of the Florida Statutes. The proposer shall not, unless required as part of this SOLICITATION, submit any information in response to this invitation which the proposer considers to be a trade secret, proprietary or confidential. The submission, not required as part of this this SOLICITATION, of any information to the City in connection with this invitation shall be deemed conclusively to be a waiver of any trade secret or other protection, which would otherwise be available to the proposer.

1.23 INFORMATION

For information concerning procedure for responding to this Solicitation (SOLICITATION), contact the Point of Contact in the Section 1.4. Such contact shall be for clarification purposes only. **It is preferred that all other questions be submitted in writing via OpenGov at least 10 calendar days prior to the bid/proposal due/opening date.**

1.24 N/A – INTENTIONALLY OMITTED

1.25 MODIFICATION AND WITHDRAWAL OF BIDS/PROPOSALS

Bids must be modified or withdrawn by an appropriate document duly executed in the manner that a bid must be executed and delivered to the place where bids are to be submitted at any time prior to the deadline for submitting bids. A request for withdrawal or a modification must be in writing and signed by a person duly authorized to do so and, in a case where signed by a deputy or subordinate, the principal's proper written grant of authority to such deputy or subordinate must accompany the request for withdrawal or modification. Withdrawal of a bid will not prejudice the rights of a Bidder to submit a new bid prior to the bid date and time. Except where provided in the following paragraph no bid may be withdrawn or modified after expiration of the period for receiving bids.

If, within twenty-four (24) hours after bids are opened, any Bidder files a duly signed written notice with the City and within five (5) calendar days thereafter demonstrates to the reasonable satisfaction of the City by clear and convincing evidence that there was a material and substantial mistake in the preparation of its bid, or that the mistake is clearly evident on the face of the bid but the intended correct bid is not similarly evident, then the Bidder may withdraw its bid and the bid Security will be returned.

1.26 N/A – INTENTIONALLY OMITTED

1.27 OPEN END CONTRACT

No guarantee is expressed or implied as to the total quantity of commodities/services to be purchased under any open end contract. Estimated quantities will be used for bid comparison purposes only. The City reserves the right to issue purchase orders as and when required, or a blanket purchase order and release partial quantities as and when required or any combination of the preceding.

ORDERING: The CITY reserves the right to purchase commodities/services specified herein through Contracts established by other governmental agencies or through separate procurement actions due to unique or special needs. If an urgent

delivery is required within a period shorter than the delivery time specified in the contract, and if the seller is unable to comply therewith, the City reserves the right to obtain such delivery from others without penalty or prejudice to the City or to the Bidder.

1.28 AUDIT RIGHTS

The City reserves the right to audit the records of the successful Bidder for the commodities and/or services provided under the Contract at any time during the performance and term of the Contract and for a period of three (3) years after completion and acceptance by the City. If required by the City, the successful Bidder agrees to submit to an audit by an independent certified public accountant selected by the City. The successful Bidder shall allow the City to inspect, examine and review the records of the successful Bidder in relation to this contract at any and all times during normal business hours during the term of the Contract.

1.29 LOCAL, STATE AND FEDERAL COMPLIANCE REQUIREMENTS

The Bidder shall comply with all local, state and federal directives, orders and laws as applicable to this SOLICITATION and subsequent contract(s) including, but not limited to:

- A. Equal Employment Opportunity (EEO), in compliance with Executive Order 11246 as amended and applicable to this contract.
- B. All manufactured items and fabricated assemblies shall comply with applicable requirements of the Occupation Safety and Health Act of 1970 as amended, and be in compliance with Chapter 442, Florida Statutes. Any toxic substance listed in Section 38F-41.03 of the Florida Administrative Code delivered as a result of this order must be accompanied by a completed Material Safety Data Sheet (MSDS).
- C. The Immigration and Nationality Act prohibits (i) the employment of an unauthorized alien when the employer knows the individual is an unauthorized alien and (ii) the employment of an individual without complying with the requirements of the federal employment verification system. If a proposer commits either of these violations, such violation shall be cause for unilateral cancellation of the contract.
- D. This Section applies only to any contract for goods or services of \$1 million or more: The Proposer certifies that it is not on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List and that it does not have business operations in Cuba or Syria as provided in section 287.135, Florida Statutes (2011), as may be amended or revised. The City may terminate this Contract at the City's option if the Proposer is found to have submitted a false certification as provided under subsection (5) of section 287.135, Florida Statutes (2011), as may be amended or revised, or been placed on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List or has engaged in business operations in Cuba or Syria, as defined in Section 287.135, Florida Statutes (2011), as may be amended or revised.

1.30 FRAUD AND MISREPRESENTATION

Any individual, corporation or other entity that attempts to meet its contractual obligations with the City through fraud, misrepresentation or material misstatement, may be debarred from doing business with the City. The City as further sanction may terminate or cancel any other contracts with such individual, corporation or entity. Such individual or entity shall be responsible for all direct or indirect costs associated with termination or cancellation, including attorney's fees.

1.31 DEBARRED OR SUSPENDED BIDDERS

The bidder certifies, by submission of a response to this solicitation, that neither it nor its principals and sub bidder are presently debarred or suspended by any Federal department or agency.

1.32 COLLUSION

More than one bid/proposal received for the same work from an individual, firm, partnership, corporation or association under the same or different names will not be considered. Reasonable grounds for believing that any Bidder is interested in more than one bid for the same work will cause the rejection of such bid which the Bidder is interested. If there are reasonable grounds for believing that collusion exists among the Bidder, the bids of participants in such collusion will not be considered.

1.33 COPELAND "ANTI-KICKBACK"

The Bidder and all sub bidders will comply with the Copeland Anti-Kickback Act (18 U.S.C. 874) as supplemented in Department of Labor regulations (29 CFR Part 3).

1.34 FORCE MAJEURE

The Agreement which is awarded to the successful proposer may provide that the performance of any act by the City or Bidder hereunder may be delayed or suspended at any time while, but only so long as, either party is hindered in or prevented from performance by acts of God, the elements, war, rebellion, strikes, lockouts or any cause beyond the reasonable control of such party, provided however, the City shall have the right to provide substitute service from third parties or City forces and in such event the City shall withhold payment due the Bidder for such period of time. If the condition of force majeure exceeds a period of 14 days the City may, at its option and discretion, cancel or renegotiate this Agreement.

1.35 PUBLIC ENTITY CRIMES

A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a Bidder, supplier, sub bidder, 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 Statutes, Section 287.017, for CATEGORY TWO for a period of 36 months from the date of being placed on the convicted vendor list.

1.36 DRUG-FREE WORKPLACE PROGRAM

Preference shall be given to businesses with drug-free workplace programs. Whenever two or more bids which are equal with respect to price, quality, and service are received by the State or by any political subdivision for the procurement of commodities or contractual services, 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. Established procedures for processing tie bids will be followed if none of the tied vendors have a drug-free workplace program.

1.37 SOLICITATION, GIVING, AND ACCEPTANCE OF GIFTS POLICY

Bidder shall sign and submit the attached form indicating understanding and compliance with the City's and State's policies prohibiting solicitation and acceptance of gifts by public officers, employees and candidates. Failure to submit the signed form will result in your bid being declared non-responsive; provided, however, that a responsible Bidder whose bid would be responsive but for the failure to submit the signed form in its bid may be given the opportunity to submit the form to the City within five calendar days after notification by the City, if this is determined to be in the best interest of the City.

1.38 CONFLICT OF INTEREST

The Bidder represents that:

No officer, director, employee, agent, or other consultant of the City or a member of the immediate family or household of the aforesaid has directly or indirectly received or been promised any form of benefit, payment or compensation, whether tangible or intangible, in connection with the grant of this Agreement.

There are no undisclosed persons or entities interested with the Proposer in this Agreement. This Agreement is entered into by the Proposer without any connection with any other entity or person making a bid Bidder for the same purpose, and without collusion, fraud or conflict of interest. No elected or appointed officer or official, director, employee, agent or other consultant of the City, or of the State of Florida (including elected and appointed members of the legislative and executive branches of government), or member of the immediate family or household of any of the aforesaid:

1. Is interested on behalf of or through the Bidder directly or indirectly in any manner whatsoever in the execution or the performance of this Agreement, or in the services, supplies or work, to which this Agreement relates or in any portion of the revenues; or

2. Is an employee, agent, advisor, or consultant to the Proposer or to the best of the Proposer's knowledge, any sub bidder or supplier to the Bidder.

Neither the Bidder nor any officer, director, employee, agent, parent, subsidiary, or affiliate of the Bidder shall have an interest which is in conflict with the Bidder's faithful performance of its obligations under this Agreement; provided that the City, in its sole discretion, may consent in writing to such a relationship, and provided the Bidder provides the City with a written notice, in advance, which identifies all the individuals and entities involved and sets forth in detail the nature of the relationship and why it is in the City's best interest to consent to such relationship.

The provisions of this Article are supplemental to, not in lieu of, all applicable laws with respect to conflict of interest. In the event there is a difference between the standards applicable under this Agreement and those provided by statute, the stricter standard shall apply.

In the event the Bidder has no prior knowledge of a conflict of interest as set forth above and acquires information which may indicate that there may be an actual or apparent violation of any of the above, the Bidder shall promptly bring such information to the attention of the City's ENGINEER. The Bidder shall thereafter cooperate with the City's review and investigation of such information, and comply with the instructions the Bidder receives from the ENGINEER in regard to remedying the situation.

1.39 DISCRIMINATION

Any entity or affiliate who has been placed on the discriminatory vendor list may not submit a bid on a contract to provide goods or services to a public entity, may not submit a bid on a contract with a public entity for construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not award or perform work as a proposer, supplier, sub bidder, or consultant under contract with any public entity, and may not transact business with any public entity.

1.40 ADVICE OF OMISSION OR MISSTATEMENT

In the event it is evident to a Vendor responding to this SOLICITATION that the City has omitted or misstated a material requirement to this SOLICITATION and/or the services required by this SOLICITATION, the responding Vendor shall advise the contact identified in the SOLICITATION Clarifications and Questions section above of such omission or misstatement.

1.41 CONFIDENTIAL INFORMATION

Information contained in the Vendor's bid that is company confidential must be clearly identified in the bid/proposal itself. The City will be free to use all information in the Vendor's bid for the City's purposes, in accordance with State Law. Vendor bids shall remain confidential for 30 days or until a notice of intent to award is posted, which is sooner. The Vendor understands that any material supplied to the City may be subject to public disclosure under the Public Records Law.

1.42 GOVERNING LAW

This Contract, including appendices, and all matters relating to this Contract (whether in contract, statute, tort (such as negligence), or otherwise) shall be governed by, and construed in accordance with, the laws of the State of Florida. This shall apply notwithstanding such factors which include, but are not limited to, the place where the contract is entered into, the place where the accident occurs and notwithstanding application of conflicts of law principles.

1.43 LITIGATION VENUE

The parties waive the privilege of venue and agree that all litigation between them in the state courts shall take place in Broward County, Florida and that all litigation between them in the federal courts shall take place in the Southern District of Florida.

1.44 SOVEREIGN IMMUNITY

Nothing in this agreement shall be interpreted or construed to mean that the city waives its common law sovereign immunity or the limits of liability set forth in Section 768.28, Florida Statute.

1.45 SURVIVAL

The parties acknowledge that any of the obligations in this Agreement will survive the term, termination and cancellation hereof. Accordingly, the respective obligations of the Proposer and the City under this Agreement, which by nature would continue beyond the termination, cancellation or expiration thereof, shall survive termination, cancellation or expiration hereof.

1.46 INDEMNIFICATION AND HOLD HARMLESS AGREEMENT

The Contractor shall indemnify and hold harmless the City of Hollywood and its officers, employees, agents and instrumentalities from any and all liability, losses or damages. In addition, the City shall be entitled to attorney's fees and costs of defense, which the City of Hollywood, or its officers, employees, agents or instrumentalities may incur as a result of claims, demands, suits, causes of actions or proceedings of any kind or nature arising out of, relating to or resulting from the performance of this project by the awarded Bidder or its employees, agents, servants, partners, principals or subcontractors. Furthermore, the awarded Bidder shall pay all claims and losses in connection therewith and shall investigate and defend all claims, suits or actions of any kind of nature in the name of the City of Hollywood, where applicable, including appellate proceedings, and shall pay all costs, judgments, and attorney's fees which may issue thereon. The awarded Bidder expressly understands and agrees that any insurance protection required by the resulting agreement or otherwise provided by the awarded Bidder shall cover the City of Hollywood, its officers, employees, agents and instrumentalities and shall include claims for damages resulting from and/or caused by the negligence, recklessness or intentional wrongful misconduct of the Contractor and persons employed by or utilized by the Contractor in the performance of the contract.

1.47 PATENT AND COPYRIGHT INDEMNIFICATION

The Bidder warrants that all deliverables furnished hereunder, including but not limited to: services, equipment programs, documentation, software, analyses, applications, methods, ways, processes, and the like, do not infringe upon or violate any patent, copyrights, service marks, trade secret, or any other third party proprietary rights.

The Bidder shall be liable and responsible for any and all claims made against the City for infringement of patents, copyrights, service marks, trade secrets or any other third party proprietary rights, by the use or supplying of any programs, documentation, software, analyses, applications, methods, ways, processes, and the like, in the course of performance or completion of, or in any way connected with, the work, or the City's continued use of the deliverables furnished hereunder. Accordingly, the Bidder, at its own expense, including the payment of attorney's fees, shall indemnify, and hold harmless the City and defend any action brought against the City with respect to any claim, demand, and cause of action, debt, or liability.

In the event any deliverable or anything provided to the City hereunder, or a portion thereof, is held to constitute an infringement and its use is or may be enjoined, the Bidder shall have the obligation, at the City's option, to (i) modify, or require that the applicable sub bidder or supplier modify, the alleged infringing item(s) at the Bidder's expense, without impairing in any respect the functionality or performance of the item(s), or (ii) procure for the City, at the Bidder's expense, the rights provided under this Agreement to use the item(s).

The Bidder shall be solely responsible for determining and informing the City whether a prospective supplier or sub bidder is a party to any litigation involving patent or copyright infringement, service mark, trademark, violation, or proprietary rights claims or is subject to any injunction which may prohibit it from providing any deliverable hereunder. The Bidder shall enter into agreements with all suppliers and sub bidder at the Bidder's own risk. The City may reject any deliverable that it believes to be the subject of any such litigation or injunction, or if, in the City's judgment, use thereof would delay the work or be unlawful.

The Bidder shall not infringe any copyright, trademark, service mark, trade secrets, patent rights, or other intellectual property rights in the performance of the work.

1.48 ADVERTISING

Vendor shall not advertise or publish the fact that the City has placed this order without prior written consent from the City, except as may be necessary to comply with a proper request for information from an authorized representative of a governmental unit or agency.

1.49 DISCLAIMER

The Hollywood may, in its sole discretion, accept or reject, in whole or in part, for any reason whatsoever any or all bids; re-advertise this SOLICITATION, postpone or cancel at any time this SOLICITATION process; or, waive any formalities of or irregularities in the bid process. Bids that are not submitted on time and/or do not conform to the City of Hollywood's requirements will not be considered. After all bids are analyzed, organization(s) submitting bid that appear, solely in the opinion of the City of Hollywood, to be the most competitive, shall be submitted to the City of Hollywood's City Commission, and the final selection will be made shortly thereafter with a timetable set solely by the City of Hollywood. The selection by the City of Hollywood shall be based on the bid, which is, in the sole opinion of the City Commission of the City of Hollywood, in the best interest of the City of Hollywood. The issuance of this SOLICITATION constitutes only an invitation to make a bid to the City of Hollywood. The City of Hollywood reserves the right to determine, in its sole discretion, whether any aspect of the bid satisfies the criteria established by the City. In all cases the City of Hollywood shall have no liability to any proposer for any costs or expense incurred in connection with this bid or otherwise.

1.50 TRADEMARKS

The City warrants that all trademarks the City requests the Vendor to affix to articles purchased are those owned by the City and it is understood that the Vendor shall not acquire or claim any rights, title, or interest therein, or use any of such trademarks on any articles produced for itself or anyone other than the City.

1.51 RIGHT TO REQUEST ADDITIONAL INFORMATION

The City reserves the right to request any additional information that might be deemed necessary during the evaluation process.

1.52 BID PREPARATION COSTS

The Vendor is responsible for any and all costs incurred by the Vendor or his/her sub bidders in responding to this solicitation.

1.53 DESIGN COSTS (N/A)

1.54 ADDITIONAL CHARGES

No additional charges, other than those listed on the price breakdown sheets, shall be made. Prices quoted will include verification/coordination of order, all costs for shipping, delivery to all sites, unpacking, setup, installation, operation, testing, cleanup, training and Vendor travel charges.

1.55 RIGHTS TO PERTINENT MATERIALS

All responses, inquires, and correspondence relating to this SOLICITATION and all reports, charts, displays, schedules, exhibits and other documentation produced by the Vendor that are submitted as part of the bid shall become the property of the City upon receipt, a part of a public record upon opening, and will not be returned.

1.56 INSURANCE REQUIREMENTS

See insurance requirements in the main solicitation document.

1.57 NATURE OF THE AGREEMENT

The Agreement incorporates and includes all negotiations, correspondence, conversations, agreements, and understandings applicable to the matters contained in the Agreement. The parties agree that there are no commitments, agreements, or understandings concerning the subject matter of the Agreement that are not contained in the Agreement, and that the Agreement contains the entire agreement between the parties as to all matters contained herein. Accordingly, it is agreed that no deviation from the terms hereof shall be predicated upon any prior representations or agreements, whether oral or written. It is further agreed that any oral representations or modifications concerning this Agreement shall be of no force or effect, and that the Agreement may be modified, altered or amended only by a written amendment duly executed by both parties hereto or their authorized representatives.

The Bidder shall provide the services set forth in the Scope of Services, and render full and prompt cooperation with the City in all aspects of the services performed hereunder.

The Bidder acknowledges that the Agreement requires the performance of all things necessary for or incidental to the effective and complete performance of all work and services under this Contract. All things not expressly mentioned in the Agreement but necessary to carrying out its intent are required by the Agreement, and the Bidder shall perform the same as though they were specifically mentioned, described and delineated.

The Bidder shall furnish all labor, materials, tools, supplies, and other items required to perform the work and services that are necessary for the completion of this Contract. All work and services shall be accomplished at the direction of and to the satisfaction of the City's ENGINEER.

The Bidder acknowledges that the City shall be responsible for making all policy decisions regarding the Scope of Services. The Proposer agrees to provide input on policy issues in the form of recommendations.

The Bidder agrees to implement any and all changes in providing services hereunder as a result of a policy change implemented by the City. The Bidder agrees to act in an expeditious and fiscally sound manner in providing the City with input regarding the time and cost to implement said changes and in executing the activities required to implement said changes

1.58 AUTHORITY OF THE CITY'S ENGINEER

The Bidder hereby acknowledges that the City's ENGINEER will determine in the first instance all questions of any nature whatsoever arising out of, under, or in connection with, or in any way related to or on account of, this Agreement including without limitations: questions as to the value, acceptability and fitness of the services; questions as to either party's fulfillment of its obligations under the Contract; negligence, fraud or misrepresentation before or subsequent to acceptance of the Bid; questions as to the interpretation of the Scope of Services; and claims for damages, compensation and losses.

The Bidder shall be bound by all determinations or orders and shall promptly obey and follow every order of the ENGINEER, including the withdrawal or modification of any previous order and regardless of whether the Bidder agrees with the ENGINEER's determination or order. Where orders are given orally, they will be issued in writing by the ENGINEER as soon thereafter as is practicable.

The Bidder must, in the final instance, seek to resolve every difference concerning the Agreement with the ENGINEER. In the event that the ENGINEER and the Bidder are unable to resolve their difference, the Bidder may initiate a dispute in accordance with the procedures set forth in the section below. Exhaustion of these procedures shall be a condition precedent to any lawsuit permitted hereunder.

In the event of such dispute, the parties to this Agreement authorize the City Manager or designee, who may not be the ENGINEER or anyone associated with this Project, acting personally, to decide all questions arising out of, under, or in connection with, or in any way related to or on account of the Agreement (including but not limited to claims in the nature of breach of contract, fraud or misrepresentation arising either before or subsequent to execution hereof) and the decision of each with respect to matters within the City Manager's purview as set forth above shall be conclusive, final and binding on the parties. Any such dispute shall be brought, if at all, before the City Manager within 10 days of the occurrence, event or act out of which the dispute arises.

The City Manager may base this decision on such assistance as may be desirable, including advice of experts, but in any event shall base the decision on an independent and objective determination of whether the Bidder's performance or any deliverable meets the requirements of this Agreement and any specifications with respect thereto set forth herein. The effect of any decision shall not be impaired or waived by any negotiations or settlements or offers made in connection with the dispute, whether or not the City Manager participated therein, or by any prior decision of others, which prior decision shall be deemed subject to review, or by any termination or cancellation of the Agreement. All such disputes shall be submitted in writing by the Bidder to the City Manager for a decision, together with all pertinent information in regard to such questions, in order that a fair and impartial decision may be made. The parties agree that whenever the City Manager is entitled to exercise discretion or judgment or to make a determination or form an opinion pursuant to the provisions of this Article, such action shall be deemed fair and impartial when exercised or taken. The City Manager shall render a decision in writing and deliver a copy of the same to the Bidder. Except as such remedies may be limited or waived elsewhere in the Agreement, the Bidder reserves the right to pursue any remedies available under law after exhausting the provisions of this Article.

1.59 MUTUAL OBLIGATIONS

This Agreement, including attachments and appendices to the Agreement, shall constitute the entire Agreement between the parties with respect hereto and supersedes all previous communications and representations or agreements, whether written or oral, with respect to the subject matter hereof unless acknowledged in writing by the duly authorized representatives of both parties.

Nothing in this Agreement shall be construed for the benefit, intended or otherwise, of any third party that is not a parent or subsidiary of a party or otherwise related (by virtue of ownership control or statutory control) to a party.

In those situations where this Agreement imposes an indemnity or defense obligation on the Bidder, the City may, at its expense, elect to participate in the defense if the City should so choose. Furthermore, the City may at its own expense defend or settle any such claims if the Bidder fails to diligently defend such claims, and thereafter seek indemnity for costs and attorney's fees from the Bidder.

1.60 SUBCONTRACTUAL RELATIONS

If the Bidder will cause any part of this Agreement to be performed by a sub bidder, the provisions of this Contract will apply to such sub bidder and its officers, agents and employees in all respects as if it and they were employees of the Proposer; and the Proposer will not be in any manner thereby discharged from its obligations and liabilities hereunder, but will be liable hereunder for all acts and negligence of the sub bidder, its officers, agents, and employees, as if they were employees of the Proposer. The services performed by the sub bidder will be subject to the provisions hereof as if performed directly by the Bidder.

The Bidder, before making any subcontract for any portion of the services, will state in writing to the City the name of the proposed sub bidder, the portion of the services which the sub bidder is to do, the place of business of such sub bidder, and such other information as the City may require. The City will have the right to require the Bidder not to award any subcontract to a person, firm or corporation disapproved by the City.

Before entering into any subcontract hereunder, the Bidder will inform the sub bidder fully and completely of all provisions and requirements of this Agreement relating either directly or indirectly to the services to be performed. Such services performed by such sub bidder will strictly comply with the requirements of this Contract.

In order to qualify as a sub bidder satisfactory to the City, in addition to the other requirements herein provided, the sub bidder must be prepared to prove to the satisfaction of the City that it has the necessary facilities, skill and experience, and ample financial resources to perform the services in a satisfactory manner. To be considered skilled and experienced, the sub bidder must show to the satisfaction of the City that it has satisfactorily performed services of the same general type which are required to be performed under this Agreement.

The City shall have the right to withdraw its consent to a subcontract if it appears to the City that the subcontract will delay, prevent, or otherwise impair the performance of the Bidder's obligations under this Agreement. All sub bidder are required to protect the confidentiality of the City and City's proprietary and confidential information. The Bidder shall furnish to the City copies of all subcontracts between the Bidder and sub bidder and suppliers hereunder. Within each such subcontract, there shall be a clause for the benefit of the City permitting the City to request completion of performance by the sub bidder of its obligations under the subcontract, in the event the City finds the Bidder in breach of its obligations, and the option to pay the sub bidder directly for the performance by such sub bidder. The foregoing shall neither convey nor imply any obligation or liability on the part of the City to any sub bidder hereunder as more fully described herein.

1.61 PROMPT PAYMENT: LATE PAYMENTS BY BIDDER TO SUB BIDDER AND MATERIAL SUPPLIERS; PENALTY:

When a Bidder receives from the City of Hollywood any payment for contractual services, commodities, materials, supplies, or construction contracts, the proposer shall pay such moneys received to each sub bidder and material supplier in proportion to the percentage of work completed by each sub bidder and material supplier at the time of receipt. If the Bidder receives less than full payment, then the proposer shall be required to disburse only the funds received on a pro rata basis to the sub bidder and materials Suppliers, each receiving a prorated portion based on the amount due on the payment. If the proposer without reasonable cause fails to make payments required by this section to sub bidder and material suppliers within fifteen (15) working days after the receipt by the Bidder of full or partial payment, the proposer shall pay to the sub bidder and material suppliers a penalty in the amount of one percent (1%) of the amount due, per month, from the expiration of the period allowed herein for payment. Such penalty shall be in addition to actual payments owed. Retainage is also subject to the prompt payment requirement and must be returned to the sub bidder or material

supplier whose work has been completed, even if the prime contract has not been completed. The Bidder shall include the above obligation in each subcontract it signs with a sub bidder or material supplier.

1.62 TERMINATION FOR CONVENIENCE AND SUSPENSION OF WORK

The City may terminate this Agreement if an individual or corporation or other entity attempts to meet its contractual obligation with the City through fraud, misrepresentation or material misstatement.

The City may, as a further sanction, terminate or cancel any other contract(s) that such individual or corporation or other entity has with the City. Such individual, corporation or other entity shall be responsible for all direct and indirect costs associated with such termination or cancellation, including attorney's fees.

The foregoing notwithstanding, any individual, corporation or other entity which attempts to meet its contractual obligations with the City through fraud, misrepresentation or material misstatement may be debarred from City contracting in accordance with the City debarment procedures. The Bidder may be subject to debarment for failure to perform and any other reasons related to the Bidder's breach or failure of satisfactory performance.

In addition to cancellation or termination as otherwise provided in this Agreement, the City may at any time, in its sole discretion, with or without cause, terminate this Agreement by written notice to the Bidder and in such event:

The Bidder shall, upon receipt of such notice, unless otherwise directed by the City:

1. Stop work on the date specified in the notice ("the Effective Termination Date");
2. Take such action as may be necessary for the protection and preservation of the City's materials and property;
3. Cancel orders;
4. Assign to the City and deliver to any location designated by the City any non-cancelable orders for deliverables that are not capable of use except in the performance of this Agreement and which have been specifically developed for the sole purpose of this Agreement and not incorporated in the services;
5. Take no action which will increase the amounts payable by the City under this Agreement.

In the event that the City exercises its right to terminate this Agreement pursuant to this Article, the Bidder will be compensated as stated in the payment articles herein, for the:

1. Portion of the services completed in accordance with the Agreement up to the Effective Termination Date; and
2. Non-cancelable deliverables that are not capable of use except in the performance of this Agreement and which have been specifically developed for the sole purpose of this Agreement but not incorporated in the services.

All compensation pursuant to this Article is subject to audit.

1.63 EVENT OF DEFAULT

An Event of Default shall mean a breach of this Agreement by the Bidder. Without limiting the generality of the foregoing and in addition to those instances referred to herein as a breach, an Event of Default, shall include the following:

1. The Bidder has not delivered deliverables on a timely basis;
2. The Bidder has refused or failed, except in any case for which an extension of time is provided, to supply enough properly skilled staff personnel;
3. The Bidder has failed to make prompt payment to sub bidder or suppliers for any services;

4. The Bidder has become insolvent (other than as interdicted by the bankruptcy laws), or has assigned the proceeds received for the benefit of the Bidder 's creditors, or the Bidder has taken advantage of any insolvency statute or debtor/creditor law or if the Bidder 's affairs have been put in the hands of a receiver;
5. The Bidder has failed to obtain the approval of the City where required by this Agreement;
6. The Bidder has failed to provide "adequate assurances" as required under subsection "B" below; and
7. The Bidder has failed in the representation of any warranties stated herein.

When, in the opinion of the City, reasonable grounds for uncertainty exist with respect to the Proposer's ability to perform the services or any portion thereof, the City may request that the Proposer, within the time frame set forth in the City's request, provide adequate assurances to the City, in writing, of the Proposer's ability to perform in accordance with terms of this Agreement. Until the City receives such assurances the City may request an adjustment to the compensation received by the Proposer for portions of the services which the Proposer has not performed. In the event that the Proposer fails to provide to the City the requested assurances within the prescribed time frame, the City may:

1. Treat such failure as a repudiation of this Agreement;
2. Resort to any remedy for breach provided herein or at law, including but not limited to, taking over the performance of the services or any part thereof either by itself or through others.

In the event the City shall terminate this Agreement for default, the City or its designated representatives may immediately take possession of all applicable equipment, materials, products, documentation, reports and data.

1.64 REMEDIES IN THE EVENT OF DEFAULT

If an Event of Default occurs, the Proposer shall be liable for all damages resulting from the default, including but not limited to:

- A. Lost revenues;
- B. The difference between the cost associated with procuring services hereunder and the amount actually expended by the City for procurement of services, including procurement and administrative costs; and,
- C. Such other damages that the City may suffer.

The Proposer shall also remain liable for any liabilities and claims related to the Proposer's default. The City may also bring any suit or proceeding for specific performance or for an injunction.

1.65 BANKRUPTCY

The City reserves the right to terminate this contract if, during the term of any contract the Proposer has with the City, the Proposer becomes involved as a debtor in a bankruptcy proceeding, or becomes involved in a reorganization, dissolution, or liquidation proceeding, or if a trustee or receiver is appointed over all or a substantial portion of the property of the Proposer under federal bankruptcy law or any state insolvency law.

1.66 CANCELLATION FOR UNAPPROPRIATED FUNDS

The obligation of the City for payment to a Proposer is limited to the availability of funds appropriated in a current fiscal period, and continuation of the contract into a subsequent fiscal period is subject to appropriation of funds, **unless otherwise authorized by law.**

1.67 VERBAL INSTRUCTIONS PROCEDURE

No negotiations, decisions, or actions shall be initiated or executed by the Proposer as a result of any discussions with any City employee. Only those communications which are in writing from an authorized City representative may be considered. Only written communications from Proposers, which are signed by a person designated as authorized to bind the Proposer, will be recognized by the City as duly authorized expressions on behalf of the Proposer.

1.68 E-VERIFY

Proposer acknowledges that the City may be utilizing the Proposer's services for a project that is funded in whole or in part by State funds pursuant to a contract between the City and a State agency. The Proposer shall be responsible for complying with the E-Verify requirements in the contract and using the U.S. Department of Homeland Security's E-Verify system to verify the employment of all new employees hired by the Proposer during the Agreement term. The Proposer is also responsible for e-verifying its bidders, if any, pursuant to any agreement between the City and a State Agency, and reporting to the City any required information. The Proposer acknowledges that the terms of this paragraph are material terms, the breach of any of which shall constitute a default under this Agreement.

1.69 BUDGETARY CONSTRAINTS

In the event the City is required to reduce contract costs due to budgetary constraints, all services specified in this document may be subject to a permanent or temporary reduction in budget. In such an event, the total cost for the affected service shall be reduced as required. The Proposer shall also be provided with a minimum 30-day notice prior to any such reduction in budget.

1.70 COST ADJUSTMENTS (As Applicable)

The cost for all items as quoted herein shall remain firm for the first term of the contract. Costs for subsequent years and any extension term years shall be subject to an adjustment only if increases occur in the industry. However, unless very unusual and significant changes have occurred in the industry, such increases shall not exceed 3% per year or, whichever is less, the latest yearly percentage increase in the All Urban Consumers Price Index (CPU-U) (National) as published by the Bureau of Labor Statistics, U.S. Dept. of Labor. The yearly increase or decrease in the CPI shall be that latest index published and available ninety (90) days prior to the end of the contract year than in effect compared to the index for the same month one year prior. Any requested cost increase shall be fully documented and submitted to the City at least ninety (90) days prior to the contract anniversary date. Any approved cost adjustments shall become effective upon the anniversary date of the contract. In the event the CPI or industry costs decline, the City shall have the right to receive from the Proposer a reduction in costs that reflects such cost changes in the industry. The City may, after examination, refuse to accept the adjusted costs if they are not properly documented, increases are considered to be excessive, or decreases are considered to be insufficient. In the event the City does not wish to accept the adjusted costs and the matter cannot be resolved to the satisfaction of the City, the contract can be cancelled by the City upon giving thirty (30) days written notice to the Proposer.

1.71 OSHA STANDARDS

Proposer acknowledges and agrees that as Contractor for the City of Hollywood, Florida, within the limits of the City of Hollywood, Florida, will have the sole responsibility for compliance with all requirements of the Federal Occupational Safety and Health Act of 1970, and all State and local safety and health regulations, and agrees to defend, indemnify and hold harmless the City of Hollywood, Florida, its officials, employees, service providers, and its agents against any and all legal liability or loss the City of Hollywood, Florida may incur due to the Contractor's failure to comply with such act.

END OF SECTION



City of Hollywood
Public Utilities
Vincent Morello, Director
2600 Hollywood Boulevard, Hollywood, FL 33020

[RF ENVIRONMENTAL SERVICES, INC.] RESPONSE DOCUMENT REPORT

IFB No. IFB-211-24-JJ

Replacement of Nanofiltration Process Pressure Vessels and Membrane Elements

RESPONSE DEADLINE: July 11, 2024 at 3:00 pm

Report Generated: Thursday, July 11, 2024

RF Environmental Services, Inc. Response

CONTACT INFORMATION

Company:

RF Environmental Services, Inc.

Email:

thad@rfeswater.com

Contact:

Thaddeus Buckley

Address:

4840 NE 11th Ave
Oakland Park, FL 33334

Phone:

(954) 605-6711

Website:

rfeswater.com

Submission Date:

Jul 11, 2024 2:46 PM

ADDENDA CONFIRMATION

Addendum #1

Confirmed Jul 11, 2024 2:29 PM by Thaddeus Buckley

Addendum #2

Confirmed Jul 11, 2024 2:29 PM by Thaddeus Buckley

QUESTIONNAIRE

1. VENDOR REFERENCE FORM*

Please download the below documents, complete, and upload.

- [Vendor Reference Form.pdf](#)

Vendor_Ref_Form_-_Frank.pdf

Vendor_Ref_Form_-_jeff.pdf

Vendor_Ref_Form_-_Oscar.pdf

2. HOLD HARMLESS AND INDEMNITY CLAUSE*

I, an authorized representative, the contractor, shall indemnify, defend and hold harmless the City of Hollywood, its elected and appointed officials, employees and agents for any and all suits, actions, legal or administrative proceedings, claims, damage, liabilities, interest, attorney's fees, costs of any kind whether arising prior to the start of activities or following the completion or acceptance and in any manner directly or indirectly caused, occasioned or contributed to in whole or in part by reason of any act, error or omission, fault or negligence whether active or passive by the contractor, or anyone acting under its direction, control, or on its behalf in connection with or incident to its performance of the contract.

Confirmed

3. NON-COLLUSION STATEMENT*

I, being first duly sworn, depose that:

- A. He/she is an authorized representative of the Company, the Proposer that has submitted the attached Proposal.
- B. He/she has been fully informed regarding the preparation and contents of the attached Proposal and of all pertinent circumstances regarding such Proposal;
- C. Such Proposal is genuine and is not a collusion or sham Proposal;
- D. Neither the said Proposer nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Proposer, firm or person to submit a collusive or sham Proposal in connection with the contractor for which the attached Proposal has been submitted or to refrain from bidding in connection with such contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Proposer, firm or person to fix the price or prices, profit or cost element of the Proposal price or the Proposal price of any other Proposer, or to secure an advantage against the City of Hollywood or any person interested in the proposed Contract; and
- E. The price or prices quoted in the attached Proposal are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Proposer or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

Confirmed

4. CERTIFICATIONS REGARDING DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITY MATTERS*

The applicant certifies that it and its principals:

- A. Are not presently debarred, suspended, proposed for debarment, declared ineligible, sentenced to a denial of Federal benefits by a State or Federal court, or voluntarily excluded from covered transactions by any Federal department or agency;
- B. Have not within a three-year period preceding this application been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction, violation of Federal or State antitrust statutes or

commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

- C. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (b) of this certification; and
- D. Have not within a three-year period preceding this application had one or more public transactions (Federal, State, or local) terminated for cause or default.

Confirmed

5. DRUG-FREE WORKPLACE PROGRAM*

- A. IDENTICAL TIE PROPOSALS - Preference shall be given to businesses with drug-free workplace programs. Whenever two or more bids which are equal with respect to price, quality, and service are received by the State or by any political subdivision for the procurement of commodities or contractual services, 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. Established procedures for processing tie proposals will be followed if none of the tied vendors have a drug-free workplace program. In order to have a drug-free workplace program, a business shall:
 - 1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
 - 2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
 - 3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).
 - 4. In the statement specified in subsection (1), notify the employee that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer

of any conviction of, or plea of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.

5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program (if such is available in the employee's community) by, any employee who is so convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of these requirements.

As the person authorized to sign the statement, I certify that this firm complies fully with the above requirements.

Confirmed

6. SOLICITATION, GIVING, AND ACCEPTANCE OF GIFTS POLICY *

Florida Statute 112.313 prohibits the solicitation or acceptance of Gifts. "No Public officer, employee of an agency, local government attorney, or candidate for nomination or election shall solicit or accept anything of value to the recipient, including a gift, loan, reward, promise of future employment, favor, or service, based upon any understanding that the vote, official action, or judgment of the public officer, employee, local government attorney, or candidate would be influenced thereby." The term "public officer" includes "any person elected or appointed to hold office in any agency, including any person serving on an advisory body."

The City of Hollywood/Hollywood CRA policy prohibits all public officers, elected or appointed, all employees, and their families from accepting any gifts of any value, either directly or indirectly, from any contractor, vendor, consultant, or business with whom the City/CRA does business.

The State of Florida definition of "gifts" includes the following:

- Real property or its use,
- Tangible or intangible personal property, or its use,
- A preferential rate or terms on a debt, loan, goods, or services,
- Forgiveness of indebtedness,
- Transportation, lodging, or parking,
- Food or beverage,

- Membership dues,
- Entrance fees, admission fees, or tickets to events, performances, or facilities,
- Plants, flowers or floral arrangements
- Services provided by persons pursuant to a professional license or certificate.
- Other personal services for which a fee is normally charged by the person providing the services.
- Any other similar service or thing having an attributable value not already provided for in this section.

Any contractor, vendor, consultant, or business found to have given a gift to a public officer or employee, or his/her family, will be subject to dismissal or revocation of contract.

As the person authorized to sign the statement, I certify that this firm will comply fully with this policy.

Confirmed

7. Certificate of Insurance*

See requirements in the [#SPECIAL TERM AND CONDITIONS](#) section.

COI_-City_of_Hollywood.pdf

8. PROOF OF SUNBIZ REGISTRATION*

Enter company FEIN to be verified in Sunbiz

81-1455710

[Click to Verify](#) *Value will be copied to clipboard*

9. ACKNOWLEDGMENT AND SIGNATURE PAGE

IF CORPORATION - DATE INCORPORATED/ORGANIZED:*

01/27/2016

STATE INCORPORATED/ORGANIZED:*
FL

REMITTANCE ADDRESS*

4840 NE 11th Ave
Oakland Park, FL 33334

BIDDER/PROPOSER'S AUTHORIZED REPRESENTATIVE'S TYPED FULL NAME*
Thaddeus Buckley

IT IS HEREBY CERTIFIED AND AFFIRMED THAT THE BIDDER/PROPOSER CERTIFIES ACCEPTANCE OF THE TERMS, CONDITIONS, SPECIFICATIONS, ATTACHMENTS AND ANY ADDENDA. THE BIDDER/PROPOSER SHALL ACCEPT ANY AWARDS MADE AS A RESULT OF THIS SOLICITATION. BIDDER/PROPOSER FURTHER AGREES THAT PRICES QUOTED WILL REMAIN FIXED FOR THE PERIOD OF TIME STATED IN THE SOLICITATION.*

Confirmed

THE EXECUTION OF THIS FORM CONSTITUTES THE UNEQUIVOCAL OFFER OF BIDDER/PROPOSER TO BE BOUND BY THE TERMS OF ITS PROPOSAL. FAILURE TO SIGN THIS SOLICITATION WHERE INDICATED BY AN AUTHORIZED REPRESENTATIVE SHALL RENDER THE BID/PROPOSAL NON-RESPONSIVE. THE CITY MAY, HOWEVER, IN ITS SOLE DISCRETION, ACCEPT ANY BID/PROPOSAL THAT INCLUDES AN EXECUTED DOCUMENT WHICH UNEQUIVOCALLY BINDS THE BIDDER/PROPOSER TO THE TERMS OF ITS OFFER.*

Confirmed

BID FORM*

Please download the below documents, complete, and upload.

- [Bid_Form_MASTER.docx](#)

Bid_Form.pdf

Whole_Bid_Packet.pdf

10. SWORN STATEMENT PURSUANT TO SECTION 287.133 (3) (a) FLORIDA STATUTES ON PUBLIC ENTITY CRIMES

THIS FORM STATEMENT IS SUBMITTED TO THE CITY OF HOLLYWOOD BY:*

(Print individual's name and title) (Print name of entity submitting sworn statement)

THaddeus Buckley

SWORN STATEMENT CONTINUATION:*

Enter business address:

4840 NE 11th Ave Oakland Park FL 33334

SWORN STATEMENT CONTINUATION:*

Enter Federal Employer Identification Number (FEIN) is:

If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement.

81-1455710

SWORN STATEMENT CONTINUATION:*

I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in an federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

YES

SWORN STATEMENT CONTINUATION:*

I understand that “Affiliate,” as defined in paragraph 287.133(1)(a), Florida Statutes, means:

1. A predecessor or successor of a person convicted of a public entity crime, or
2. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term “affiliate” includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm’s length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

Confirmed

SWORN STATEMENT CONTINUATION:*

I understand that “person,” as defined in Paragraph 287.133(1)(e), Florida Statues, means any natural person or any entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which bids or applies to bid on contracts let by a public entity, or which otherwise transacts or applies to transact business with a public entity.

The term “person” includes those officers, executives, partners, shareholders, employees, members, and agents who are active in management of an entity

Confirmed

SWORN STATEMENT CONTINUATION:*

Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. (Please indicate which statement applies.)

Division of Administrative Hearings, determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. (attach a copy of the Final Order).

Neither the entity submitting sworn statement, nor any of its officers, director, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, nor any affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

SWORN STATEMENT CONFIRMATION*

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 (ONE) ABOVE IS FOR THAT PUBLIC ENTITY ONLY AND THAT THIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THAT PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017 FLORIDA STATUTES FOR A CATEGORY TWO OF ANY CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.

Confirmed

PRICE TABLES

[RF ENVIRONMENTAL SERVICES, INC.] RESPONSE DOCUMENT REPORT
 IFB No. IFB-211-24-JJ
 Replacement of Nanofiltration Process Pressure Vessels and Membrane Elements

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
1	Furnish replacement membrane pressure vessels, including all associated accessories, connections, and adapters necessary for installation on the existing NF units.	378	EA.	\$1,800.00	\$680,400.00
2	Furnish replacement membrane elements, including all associated accessories, connections, and adapters necessary for installation in the new pressure vessels, including 21 spare elements.	2,583	EA.	\$530.00	\$1,368,990.00
3	Complete installation, start-up, and testing of replacement pressure vessels and membrane elements in each NF unit.	7	EA.	\$203,000.00	\$1,421,000.00
4	Provide all other CONTRACTOR and MEM services not included in other bid items.	1	L.S	\$238,600.00	\$238,600.00
5	Contingency	1	Allowance	\$250,000.00	\$250,000.00
6	Indemnification	1	L.S.	\$10.00	\$10.00
7	Mobilization	1	L.S.	\$120,000.00	\$120,000.00
8	Demobilization	1	L.S.	\$10,000.00	\$10,000.00
9	Testing/Permitting	1	Allowance	\$50,000.00	\$50,000.00
TOTAL					\$4,139,000.00

FORM 4 VENDOR REFERENCE FORM

City of Hollywood Solicitation #: IFB-211-24-JJ
 Reference for: Thaddeus Buckley (as PM for P&K)

Organization/Firm Name providing reference: McCafferty Brinson
 Organization/Firm Contact Name: Frank Brinson Title: Vice President
 Email: fbrinson@mccaffertybrinson.com Phone: 954-802-3058
 Name of Referenced Project: Glades Road WTP 40 mgd- Membrane Contract No: _____
 Date Services were provided: _____ Project Amount: \$49,200,000
 Referenced Vendor's role in Project: Prime Vendor (Project manager for previous General contractor employer) Subcontractor/ Subconsultant
 Would you use the Vendor again? Yes No. Please specify in additional comments

Description of services provided by Vendor (provide additional sheet if necessary):	Project manager for construction of a 40 million gallon per day (mgd) capacity nanofiltration plant.

Please rate your experience with the Vendor	Need Improvement	Satisfactory	Excellent	Not Applicable
Vendor's Quality of Service				
a. Responsive	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Accuracy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Vendor's Organization:				
a. Staff expertise	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Professionalism	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Staff turnover	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Timeliness/Cost Control of:				
a. Project	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Additional Comments (provide additional sheet if necessary):
This reference is for the personal experience of Thad Buckley, while an employee of the Poole & Kent Company. Thad served as project manager for construction of a very large, complex project involving the integration of a 40 mgd NF plant to an existing lime softening plant. Thad did an excellent job from beginning to end, and the Owner and Engineer were very satisfied with the completed project.
****THIS SECTION FOR CITY USE ONLY****

Verified via:	Email: <input type="checkbox"/>	Verbal: <input type="checkbox"/>	Mail: <input type="checkbox"/>
Verified by:	Name:	Title:	
	Department:	Date:	

FORM 4 VENDOR REFERENCE FORM

City of Hollywood Solicitation #: IFB-211-24-JJ
 Reference for: Thaddeus Buckley (as PM for P&K)

Organization/Firm Name providing reference: City of Hollywood
 Organization/Firm Contact Name: Feng (Jeff) Jiang Title: Assistant Dir.
 Email: FJiang@hollywoodfl.org Phone: 954-921-3930
 Name of Referenced Project: Hollywood WTP Membrane Replacement Contract No: _____
 Date Services were provided: _____ Project Amount: \$1,752,000
 Referenced Vendor's role in Project: Prime Vendor Subcontractor/ Subconsultant
 Would you use the Vendor again? Yes No. Please specify in additional comments

Description of services provided by Vendor (provide additional sheet if necessary):

Please rate your experience with the Vendor	Need Improvement	Satisfactory	Excellent	Not Applicable
Vendor's Quality of Service				
a. Responsive	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Accuracy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Vendor's Organization:				
a. Staff expertise	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Professionalism	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Staff turnover	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Timeliness/Cost Control of:				
a. Project	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Additional Comments (provide additional sheet if necessary):
City is awarding RF Environmental Services "WTP Reclaim Transfer Pumps Replacement" project.

****THIS SECTION FOR CITY USE ONLY****						
Verified via:	Email:	<input type="checkbox"/>	Verbal:	<input type="checkbox"/>	Mail:	<input type="checkbox"/>
Verified by:	Name:				Title:	
	Department:				Date:	

FORM 4 VENDOR REFERENCE FORM

City of Hollywood Solicitation #: IFB-211-24-JJ
 Reference for: RF Environmental Services, Inc

Organization/Firm Name providing reference: Broward County
 Organization/Firm Contact Name: Oscar Asgar Title: Construction Project Mgr.
 Email: oasgar@broward.org Phone: 954-831-0983
 Name of Referenced Project: Broward County WTP 1A & 2A Treatment Unit Rehab Contract No: _____
 Date Services were provided: 5/20/2023 Project Amount: \$4,932,211
 Referenced Vendor's role in Project: Prime Vendor Subcontractor/ Subconsultant
 Would you use the Vendor again? Yes No. Please specify in additional comments

Description of services provided by Vendor (provide additional sheet if necessary):
Replacement of Chemical storage Tanks, installation of new Lime Slaker Systems, demolition and replacement of 30" DI treatment unit influent pipings, treatment unit launder replacement and other miscellaneous plant processes.

Please rate your experience with the Vendor	Need Improvement	Satisfactory	Excellent	Not Applicable
Vendor's Quality of Service				
a. Responsive	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Accuracy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Vendor's Organization:				
a. Staff expertise	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Professionalism	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Staff turnover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Timeliness/Cost Control of:				
a. Project	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Additional Comments (provide additional sheet if necessary):
Contractor provides excellent workmanship

THIS SECTION FOR CITY USE ONLY						
Verified via:	Email:	<input checked="" type="checkbox"/>	Verbal:	<input type="checkbox"/>	Mail:	<input type="checkbox"/>
Verified by:	Name:	Oscar Asgar			Title:	Construction Project Manager
	Department:	WWS/ WWOD			Date:	7/08/2024



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

07/09/2024

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 Brown & Brown Insurance Services, Inc. 1201 W Cypress Creek Rd Suite 130 Fort Lauderdale FL 33309	CONTACT NAME: Kemi Foster-Sterling PHONE (A/C, No, Ext): (954) 776-2222 FAX (A/C, No): (954) 776-4446 E-MAIL ADDRESS: Kemi.Foster-Sterling@bbrown.com																				
	<table border="1"> <tr> <th colspan="2">INSURER(S) AFFORDING COVERAGE</th> <th>NAIC #</th> </tr> <tr> <td>INSURER A: FCCI Insurance Company</td> <td></td> <td>10178</td> </tr> <tr> <td>INSURER B: Westchester Surplus Lines Insurance Company</td> <td></td> <td>10172</td> </tr> <tr> <td>INSURER C:</td> <td></td> <td></td> </tr> <tr> <td>INSURER D:</td> <td></td> <td></td> </tr> <tr> <td>INSURER E:</td> <td></td> <td></td> </tr> <tr> <td>INSURER F:</td> <td></td> <td></td> </tr> </table>	INSURER(S) AFFORDING COVERAGE		NAIC #	INSURER A: FCCI Insurance Company		10178	INSURER B: Westchester Surplus Lines Insurance Company		10172	INSURER C:			INSURER D:			INSURER E:			INSURER F:	
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INSURER D:																					
INSURER E:																					
INSURER F:																					
INSURED RF Environmental Services Inc, DBA: Milan Construction & Real Estate 4840 NE 11th Avenue Oakland Park FL 33334																					

COVERAGES

CERTIFICATE NUMBER: 2022-25 COI

REVISION NUMBER:

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	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input checked="" type="checkbox"/> LOC OTHER:			GL10009354700	06/27/2024	02/27/2025	EACH OCCURRENCE	\$ 1,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	\$ 100,000
							MED EXP (Any one person)	\$ 5,000
							PERSONAL & ADV INJURY	\$ 1,000,000
							GENERAL AGGREGATE	\$ 2,000,000
							PRODUCTS - COMP/OP AGG	\$ 2,000,000
								\$
A	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS ONLY <input type="checkbox"/> NON-OWNED AUTOS ONLY			CA10009354800	06/27/2024	06/27/2025	COMBINED SINGLE LIMIT (Ea accident)	\$ 1,000,000
							BODILY INJURY (Per person)	\$
							BODILY INJURY (Per accident)	\$
							PROPERTY DAMAGE (Per accident)	\$
							UM CSL	\$ 300,000
A	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> DED <input checked="" type="checkbox"/> RETENTION \$ 10,000			UMB10009355100	06/27/2024	06/27/2025	EACH OCCURRENCE	\$ 3,000,000
							AGGREGATE	\$ 3,000,000
								\$
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below Y / N <input checked="" type="checkbox"/> N		N/A	WC010007021904	06/27/2024	06/27/2025	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER	
							E.L. EACH ACCIDENT	\$ 1,000,000
							E.L. DISEASE - EA EMPLOYEE	\$ 1,000,000
							E.L. DISEASE - POLICY LIMIT	\$ 1,000,000
B	Pollution Liability			G70971070003	10/24/2022	06/27/2025	Each Pollution	\$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)

City of Hollywood is an additional insured with respect to General Liability if required by written contract.

CERTIFICATE HOLDER**CANCELLATION**City of Hollywood
2600 Hollywood Blvd

Hollywood

FL 33022

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

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6. PRICING (BID FORM)

The City is seeking bids/proposals from qualified vendors for the items listed below in accordance with the terms, conditions, and specifications contained in this solicitation.

Estimated quantities listed are for information and tabulation purposes only. No warranty or guarantee of quantities needed is given or implied. It is understood that the Contractor will furnish the City's needs as they arise.

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
1	Furnish replacement membrane pressure vessels, including all associated accessories, connections, and adapters necessary for installation on the existing NF units.	378	EA.	1,800	680,400
2	Furnish replacement membrane elements, including all associated accessories, connections, and adapters necessary for installation in the new pressure vessels, including 21 spare elements.	2,583	EA.	530	1,368,990
3	Complete installation, start-up, and testing of replacement pressure vessels and membrane elements in each NF unit.	7	EA.	203,000	1,421,000
4	Provide all other CONTRACTOR and MEM services not included in other bid items.	1	L.S	238,600	238,600
5	Contingency	1	Allowance	\$250,000.00	250,000
6	Indemnification	1	L.S.	\$10.00	10 -
7	Mobilization	1	L.S.	120,000	120,000
8	Demobilization	1	L.S.	10,000	10,000
9	Testing/Permitting	1	Allowance	\$50,000.00	50,000
TOTAL				\$ 4,139,000	

FORM 1

SUBMITTAL CHECKLIST FORM

The items below are required components of your solicitation response in order for your bid/proposal/submittal to be considered responsive and responsible. Please complete and submit this submittal checklist form as the cover page of your submittal with all of the items below in the order listed.

Please indicate Yes or No in the "Submitted (Yes/No)" column below to indicate which required components were provided with your submittal.

Submitted (Yes/No)	Required Bid Components
YES	This Submittal Checklist Form completed and included as the cover page of your submittal.
YES	A Table of Contents that clearly identifies each section and page number of your submittal.
YES	Information and/or documentation that addresses and/or meets the requirements outlined in Section III – Scope of Work/Services, including any procedural or technical enhancements/innovations which do not materially deviate from the objectives or required content of the Scope of Work/Services.
YES	<p>Forms (Completed)</p> <ul style="list-style-type: none"> Form 1 Submittal Checklist Form* Form 2 Acknowledgement and Signature Page Form 3 Bid Form* Form 4 Vendor Reference Form* Form 5 Hold Harmless and Indemnity Clause Form 6 Non-Collusion Affidavit Form 7 Sworn Statement...Public Entity Crimes Form 8 Certifications Regarding Debarment... Form 9 Drug-Free Workplace Program Form 10 Solicitation, Giving, and Acceptance... Form 11 W-9 (Request for Taxpayer Identification) Form 12 Trench Safety Form Form 13 Bid Guaranty Form Form 14 List of Subcontractors
YES	Certificate(s) of insurance that meet the requirements of Section 2.17
YES	Proof of State of Florida Sunbiz Registration

This checklist is only a guide, please read the entire solicitation to ensure that your submission includes all required information and documentation.



Table of Contents

Page 1: Form 1 Submittal Checklist
Page 2: Table of Contents
Page 3: Form 2 Acknowledgement & Signature Page
Page 4: Bid Pricing
Page 5-10: Form 4 Vendor Reference
Page 11: Form 5 Hold Harmless and Indemnity Clause
Page 12: Form 6 Non-Collusion Affidavit
Page 13-14: Form 7 Sworn statement pursuant to section 287.133 (3)(a) Florida Statutes on Public Entity Crimes
Page 15: Form 8 Certifications regarding debarment, suspension, and other responsibility matters
Page 16: Form 9 Drug-free workplace program
Page 17: Form 10 Solicitation, giving and acceptance of gifts policy
Page 18: Form 11 RFES W9
Page 19: Form 12 Trench Safety
Page 20-26: Form 13 Bid Guaranty Form
Page 27: Form 14 List if Subcontractors
Page 28-31: Form 15 Information required from Bidders- General Information
Page 32: Attachment- Contractor's License
Page 33-36: Form 16 Proposal
Page 37: Sample Certificate of Insurance – Requirements 2.17
Page 38: Proof of State of Florida Sunbiz Registration
Page 39-54: Resumes
Page 55-58: Experience sheet with related projects
Page 59-63: All Licenses
Page 64-107: Nitto/Hydranautics Permeate & Membrane Warranty

FORM 2

ACKNOWLEDGMENT AND SIGNATURE PAGE

This form must be completed and submitted by the date and the time of bid opening.

Legal Company Name (include d/b/a if applicable): RF Environmental Services, Inc.

If Corporation - Date Incorporated/Organized: 01/28/10 Federal Tax Identification Number: 81-1455710

State Incorporated/Organized: FL

Company Operating Address: 4840 NE 11 Ave

City: Fort Lauderdale State: FL Zip Code: 33314

Remittance Address (if different from ordering address):

City: _____ State: _____ Zip Code: _____

Company Contact Person: Thaddeus Buckley Email Address: Thad@rfeswater.com

Phone Number (include area code): 954-605-6711 Fax Number (include area code): _____

Company's Internet Web Address: www.rfeswater.com

IT IS HEREBY CERTIFIED AND AFFIRMED THAT THE BIDDER/PROPOSER CERTIFIES ACCEPTANCE OF THE TERMS, CONDITIONS, SPECIFICATIONS, ATTACHMENTS AND ANY ADDENDA. THE BIDDER/PROPOSER SHALL ACCEPT ANY AWARDS MADE AS A RESULT OF THIS SOLICITATION. BIDDER/PROPOSER FURTHER AGREES THAT PRICES QUOTED WILL REMAIN FIXED FOR THE PERIOD OF TIME STATED IN THE SOLICITATION.

Bidder/Proposer's Authorized Representative's Signature:  Date: 7/11/24

Type or Print Name: Thaddeus Buckley

THE EXECUTION OF THIS FORM CONSTITUTES THE UNEQUIVOCAL OFFER OF BIDDER/PROPOSER TO BE BOUND BY THE TERMS OF ITS PROPOSAL. FAILURE TO SIGN THIS SOLICITATION WHERE INDICATED BY AN AUTHORIZED REPRESENTATIVE SHALL RENDER THE BID/PROPOSAL NON-RESPONSIVE. THE CITY MAY, HOWEVER, IN ITS SOLE DISCRETION, ACCEPT ANY BID/PROPOSAL THAT INCLUDES AN EXECUTED DOCUMENT WHICH UNEQUIVOCALLY BINDS THE BIDDER/PROPOSER TO THE TERMS OF ITS OFFER.

6. PRICING (BID FORM)

The City is seeking bids/proposals from qualified vendors for the items listed below in accordance with the terms, conditions, and specifications contained in this solicitation.

Estimated quantities listed are for information and tabulation purposes only. No warranty or guarantee of quantities needed is given or implied. It is understood that the Contractor will furnish the City's needs as they arise.

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
1	Furnish replacement membrane pressure vessels, including all associated accessories, connections, and adapters necessary for installation on the existing NF units.	378	EA.	1,800	680,400
2	Furnish replacement membrane elements, including all associated accessories, connections, and adapters necessary for installation in the new pressure vessels, including 21 spare elements.	2,583	EA.	530	1,368,990
3	Complete installation, start-up, and testing of replacement pressure vessels and membrane elements in each NF unit.	7	EA.	203,000	1,421,000
4	Provide all other CONTRACTOR and MEM services not included in other bid items.	1	L.S	238,600	238,600
5	Contingency	1	Allowance	\$250,000.00	250,000
6	Indemnification	1	L.S.	\$10.00	10 -
7	Mobilization	1	L.S.	120,000	120,000
8	Demobilization	1	L.S.	10,000	10,000
9	Testing/Permitting	1	Allowance	\$50,000.00	50,000
TOTAL				\$ 4,139,000	

FORM 4 VENDOR REFERENCE FORM

City of Hollywood Solicitation #: IFB-211-24-JJ
 Reference for: RF Environmental Services, Inc

Organization/Firm Name providing reference: Broward County
 Organization/Firm Contact Name: Oscar Asgar Title: Construction Project Mgr.
 Email: oasgar@broward.org Phone: 954-831-0983
 Name of Referenced Project: Broward County WTP 1A & 2A Treatment Unit Rehab Contract No: _____
 Date Services were provided: 5/20/2023 Project Amount: \$4,932,211
 Referenced Vendor's role in Project: Prime Vendor Subcontractor/ Subconsultant
 Would you use the Vendor again? Yes No. Please specify in additional comments

Description of services provided by Vendor (provide additional sheet if necessary):
Replacement of Chemical storage Tanks, installation of new Lime Slaker Systems, demolition and replacement of 30" DI treatment unit influent pipings, treatment unit launder replacement and other miscellaneous plant processes.

Please rate your experience with the Vendor	Need Improvement	Satisfactory	Excellent	Not Applicable
Vendor's Quality of Service				
a. Responsive	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Accuracy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Vendor's Organization:				
a. Staff expertise	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Professionalism	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Staff turnover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Timeliness/Cost Control of:				
a. Project	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Additional Comments (provide additional sheet if necessary):
Contractor provides excellent workmanship

THIS SECTION FOR CITY USE ONLY						
Verified via:	Email:	<input checked="" type="checkbox"/>	Verbal:	<input type="checkbox"/>	Mail:	<input type="checkbox"/>
Verified by:	Name:	Oscar Asgar			Title:	Construction Project Manager
	Department:	WWS/ WWOD			Date:	7/08/2024

FORM 4 VENDOR REFERENCE FORM

City of Hollywood Solicitation #: IFB-211-24-JJ
 Reference for: Thaddeus Buckley (as PM for P&K)

Organization/Firm Name providing reference: City of Hollywood
 Organization/Firm Contact Name: Feng (Jeff) Jiang Title: Assistant Dir.
 Email: FJiang@hollywoodfl.org Phone: 954-921-3930
 Name of Referenced Project: Hollywood WTP Membrane Replacement Contract No: _____
 Date Services were provided: _____ Project Amount: \$1,752,000
 Referenced Vendor's role in Project: Prime Vendor Subcontractor/ Subconsultant
 Would you use the Vendor again? Yes No. Please specify in additional comments

Description of services provided by Vendor (provide additional sheet if necessary):

Please rate your experience with the Vendor	Need Improvement	Satisfactory	Excellent	Not Applicable
Vendor's Quality of Service				
a. Responsive	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Accuracy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Vendor's Organization:				
a. Staff expertise	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Professionalism	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Staff turnover	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Timeliness/Cost Control of:				
a. Project	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Additional Comments (provide additional sheet if necessary):
City is awarding RF Environmental Services "WTP Reclaim Transfer Pumps Replacement" project.

******THIS SECTION FOR CITY USE ONLY******

Verified via:	Email: <input type="checkbox"/>	Verbal: <input type="checkbox"/>	Mail: <input type="checkbox"/>
Verified by:	Name:		Title:
	Department:		Date:

FORM 4 VENDOR REFERENCE FORM

City of Hollywood Solicitation #: IFB-211-24-JJ
 Reference for: Thaddeus Buckley (as PM for P&K)

Organization/Firm Name providing reference: McCafferty Brinson
 Organization/Firm Contact Name: Frank Brinson Title: Vice President
 Email: fbrinson@mccaffertybrinson.com Phone: 954-802-3058
 Name of Referenced Project: Glades Road WTP 40 mgd- Membrane Contract No: _____
 Date Services were provided: _____ Project Amount: \$49,200,000
 Referenced Vendor's role in Project: Prime Vendor (Project manager for previous General contractor employer) Subcontractor/ Subconsultant
 Would you use the Vendor again? Yes No. Please specify in additional comments

Description of services provided by Vendor (provide additional sheet if necessary):	Project manager for construction of a 40 million gallon per day (mgd) capacity nanofiltration plant.

Please rate your experience with the Vendor	Need Improvement	Satisfactory	Excellent	Not Applicable
Vendor's Quality of Service				
a. Responsive	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Accuracy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Vendor's Organization:				
a. Staff expertise	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Professionalism	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Staff turnover	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Timeliness/Cost Control of:				
a. Project	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Additional Comments (provide additional sheet if necessary):
This reference is for the personal experience of Thad Buckley, while an employee of the Poole & Kent Company. Thad served as project manager for construction of a very large, complex project involving the integration of a 40 mgd NF plant to an existing lime softening plant. Thad did an excellent job from beginning to end, and the Owner and Engineer were very satisfied with the completed project.
****THIS SECTION FOR CITY USE ONLY****

Verified via:	Email: <input type="checkbox"/>	Verbal: <input type="checkbox"/>	Mail: <input type="checkbox"/>
Verified by:	Name:	Title:	
	Department:	Date:	

FORM 5

HOLD HARMLESS AND INDEMNITY CLAUSE

RF Environmental Services, Inc.

(Company Name and Authorized Signature, Print Name)

the contractor, shall indemnify, defend and hold harmless the City of Hollywood, its elected and appointed officials, employees and agents for any and all suits, actions, legal or administrative proceedings, claims, damage, liabilities, interest, attorney's fees, costs of any kind whether arising prior to the start of activities or following the completion or acceptance and in any manner directly or indirectly caused, occasioned or contributed to in whole or in part by reason of any act, error or omission, fault or negligence whether active or passive by the contractor, or anyone acting under its direction, control, or on its behalf in connection with or incident to its performance of the contract.



Signature

Thaddeus Buckley

Printed Name

RF Environmental Services

Name of Company

President

Title

FORM 6

NON-COLLUSION AFFIDAVIT

STATE OF: Florida

COUNTY OF: Broward, being first duly sworn, deposes and says that:

- (1) He/she is President of RF Environmental Services the Proposer that has submitted the attached Proposal.
- (2) He/she has been fully informed regarding the preparation and contents of the attached Proposal and of all pertinent circumstances regarding such Proposal;
- (3) Such Proposal is genuine and is not a collusion or sham Proposal;
- (4) Neither the said Proposer nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Proposer, firm or person to submit a collusive or sham Proposal in connection with the contractor for which the attached Proposal has been submitted or to refrain from bidding in connection with such contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Proposer, firm or person to fix the price or prices, profit or cost element of the Proposal price or the Proposal price of any other Proposer, or to secure an advantage against the City of Hollywood or any person interested in the proposed Contract; and
- (5) The price or prices quoted in the attached Proposal are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Proposer or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.



Signature

Thaddeus Buckley

Printed Name

RF Environmental Services, Inc

Name of Company

President

Title

FORM 7

SWORN STATEMENT PURSUANT TO SECTION 287.133 (3) (a) FLORIDA STATUTES ON PUBLIC ENTITY CRIMES

THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS

1. This form statement is submitted to the City of Hollywood by Traddens Buckley - President for RF Environmental Services, Inc (Print individual's name and title) (Print name of entity submitting sworn statement) whose business address is 4840 NE 11 AVE, FORT LAUDERDALE, FL 33314 and if applicable its Federal Employer Identification Number (FEIN) is 81-1455710. If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement.

2. I understand that "public entity crime," as defined in paragraph 287.133(1)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or with the United States, including, but not limited to, any bid, proposal, reply, or contract for goods or services, any lease for real property, or any contract for the construction or repair of a public building or public work, involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misinterpretation.
3. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in an federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.
4. I understand that "Affiliate," as defined in paragraph 287.133(1)(a), Florida Statutes, means:
 1. A predecessor or successor of a person convicted of a public entity crime, or
 2. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.
5. I understand that "person," as defined in Paragraph 287.133(1)(e), Florida Statutes, means any natural person or any entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which bids or applies to bid on contracts let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

6. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. (Please indicate which statement applies.)

Neither the entity submitting sworn statement, nor any of its officers, director, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, nor any affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime, but the Final Order entered by the Hearing Officer in a subsequent proceeding before a Hearing Officer of the State of the State of Florida,

Division of Administrative Hearings, determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. (attach a copy of the Final Order).

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 (ONE) ABOVE IS FOR THAT PUBLIC ENTITY ONLY AND THAT THIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THAT PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017 FLORIDA STATUTES FOR A CATEGORY TWO OF ANY CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.



(Signature)

Sworn to and subscribed before me this 11th day of July, 2024.

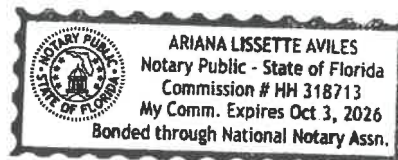
Personally known _____

Or produced identification _____ Notary Public-State of FLORIDA

DRIVERS LICENSE
(Type of identification) my commission expires 10.03.26



(Printed, typed or stamped commissioned name of notary public)



FORM 8

CERTIFICATIONS REGARDING DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITY MATTERS

The applicant certifies that it and its principals:

- (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, sentenced to a denial of Federal benefits by a State or Federal court, or voluntarily excluded from covered transactions by any Federal department or agency;
- (b) Have not within a three-year period preceding this application been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction, violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- (c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (b) of this certification; and
- (d) Have not within a three-year period preceding this application had one or more public transactions (Federal, State, or local) terminated for cause or default.

Applicant Name and Address:

RF Environmental Services, INC

4840 NE 11 AVE

Fort Lauderdale, FL 33334

Application Number and/or Project Name:

Hollywood Replacement Nanofiltration, Pressure vessels & Membrane

Applicant IRS/Vendor Number: 81-1455710


Signature

Thaddeus Buckley
Printed Name

RF Environmental services
Name of Company

President
Title

FORM 9

DRUG-FREE WORKPLACE PROGRAM

IDENTICAL TIE PROPOSALS - Preference shall be given to businesses with drug-free workplace programs. Whenever two or more bids which are equal with respect to price, quality, and service are received by the State or by any political subdivision for the procurement of commodities or contractual services, 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. Established procedures for processing tie proposals will be followed if none of the tied vendors have a drug-free workplace program. In order to have a drug-free workplace program, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).
4. In the statement specified in subsection (1), notify the employee that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.
5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program (if such is available in the employee's community) by, any employee who is so convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of these requirements.

As the person authorized to sign the statement, I certify that this firm complies fully with the above requirements.

Signature

Printed Name

RF Environmental Services
Name of Company

Thaddeus Buckley
President
Title

FORM 10

SOLICITATION, GIVING, AND ACCEPTANCE OF GIFTS POLICY

Florida Statute 112.313 prohibits the solicitation or acceptance of Gifts. "No Public officer, employee of an agency, local government attorney, or candidate for nomination or election shall solicit or accept anything of value to the recipient, including a gift, loan, reward, promise of future employment, favor, or service, based upon any understanding that the vote, official action, or judgment of the public officer, employee, local government attorney, or candidate would be influenced thereby." The term "public officer" includes "any person elected or appointed to hold office in any agency, including any person serving on an advisory body."

The City of Hollywood/Hollywood CRA policy prohibits all public officers, elected or appointed, all employees, and their families from accepting any gifts of any value, either directly or indirectly, from any contractor, vendor, consultant, or business with whom the City/CRA does business.

The State of Florida definition of "gifts" includes the following:

- Real property or its use,
- Tangible or intangible personal property, or its use,
- A preferential rate or terms on a debt, loan, goods, or services,
- Forgiveness of indebtedness,
- Transportation, lodging, or parking,
- Food or beverage,
- Membership dues,
- Entrance fees, admission fees, or tickets to events, performances, or facilities,
- Plants, flowers or floral arrangements
- Services provided by persons pursuant to a professional license or certificate.
- Other personal services for which a fee is normally charged by the person providing the services.
- Any other similar service or thing having an attributable value not already provided for in this section.

Any contractor, vendor, consultant, or business found to have given a gift to a public officer or employee, or his/her family, will be subject to dismissal or revocation of contract.

As the person authorized to sign the statement, I certify that this firm will comply fully with this policy.



Signature

Matthew Buckley

Printed Name

RF-Environmental Services

Name of Company

President

Title

Request for Taxpayer Identification Number and Certification

Give Form to the requester. Do not send to the IRS.

Go to www.irs.gov/FormW9 for instructions and the latest information.

Print or type.
See specific instructions on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.
RF Environmental Services, Inc.

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only one of the following seven boxes.
 Individual/sole proprietor or single-member LLC
 C Corporation
 S Corporation
 Partnership
 Trust/estate
 Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____
 Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check another LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.
 Other (see instructions) ▶ _____

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):
 Exempt payee code (if any) _____
 Exemption from FATCA reporting code (if any) _____
(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.
4840 NE 11th Ave

6 City, state, and ZIP code
Oakland Park, FL 33334

7 List account number(s) here (optional)

Requester's name and address (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

--	--	--	--	--	--	--	--	--	--

OR

Employer identification number

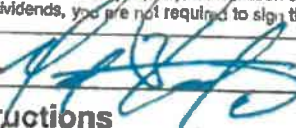
8	1	-	1	4	5	5	7	1	0
---	---	---	---	---	---	---	---	---	---

Part II Certification

Under penalties of perjury, I certify that:

- The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
- I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
- I am a U.S. citizen or other U.S. person (defined below); and
- The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here Signature of U.S. person  Date ▶ **1/2/24**

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to www.irs.gov/FormW9.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)

- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See *What is backup withholding*, later.

FORM 12

TRENCH SAFETY

This form must be completed and signed by the Respondent.

Failure to complete this form may result in the solicitation being declared non-responsive.

Respondent acknowledges that the Florida Trench Safety Act, Section 553.60 et. seq., which became effective October 1, 1990, shall be in effect during the period of construction of the project. The respondent by signing and submitting the solicitation is, in writing, assuring that it will perform any trench excavation in accordance with applicable trench safety standards. The respondent further identifies the following separate item of cost of compliance with the applicable trench safety standards as well as the method of compliance:

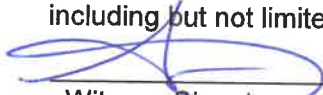
Method of Compliance

Cost

Total \$ \$100.00

Respondent acknowledges that this cost is included in the applicable items of their submittal and in the Grand Total Solicitation Price. Failure to complete the above will result in the solicitation being declared non-responsive.

The Respondent is, and the Owner and Engineer are not, responsible to review or assess Respondent's safety precautions, programs or costs, or the means, methods, techniques or technique adequacy, reasonableness of cost, sequences or procedures of any safety precaution, program or cost, including but not limited to, compliance with any and all requirements of Florida Statute Section 553.60 et. seq. cited as the "Trench Safety Act." Respondent is, and the owner and Engineer are not, responsible to determine if any safety related standards apply to the project, including but not limited to, the "Trench Safety Act."



Witness Signature

Ariana Avites

Witness Printed Name

2649 Johnson St Hollywood
FL 33020

Witness Address

7/11/24

Date



Contractor's Signature

Thaddeus Buckley

Printed Name

President

Title

7/11/24

Date

- END OF SECTION -

Form 13

Bid Guaranty Form

(Construction)

STATE OF FLORIDA

KNOW ALL MEN BY THESE PRESENTS:

That we RF Environmental Services, Inc., as Principal, and Atlantic Specialty Insurance Company, as

Surety, are held and firmly bound unto the City of Hollywood in the sum of Four Million One Hundred Thirty Nine Thousand Dollars (\$ 4,139,000.00)

of the United States, amounting to 5% of the total SOLICITATION Price, for the payment of said sum, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal has submitted the accompanying SOLICITATION, dated July 11th 2024 for

**SOLICITATION- IFB-211-24-JJ
Replacement of Nanofiltration Process Pressure Vessels and
Membrane Elements**

NOW, THEREFORE, if the principal shall not withdraw said SOLICITATION within 90 days after date of the same and shall within ten days after the prescribed forms are presented to him for signature, enter into a written contract with the CITY, in accordance with the SOLICITATION as accepted, and give bond with good and sufficient surety or sureties, and provide the necessary Insurance Certificates as may be required for the faithful performance and proper fulfillment of such Contract, then this obligation shall be null and void.

Approved SOLICITATION Bond

In the event of the withdrawal of said SOLICITATION within the specified period, or the failure to enter into such contract and give such bond and insurance within the specified time, the principal and the surety shall pay to the City of Hollywood the difference between the amount specified in said SOLICITATION and such larger amount for which the City of Hollywood may in good faith contract with another party to perform the work and/or supply the materials covered by said SOLICITATION.

IN WITNESS WHEREOF, the above bound parties have executed this statement under their several seals this _____ 11th _____ day of July _____, 2024, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

WHEN THE PRINCIPAL IS AN INDIVIDUAL:

Signed, sealed and delivered in the presence of:

Witness

Signature of Individual

Address

Printed Name of Individual

Witness

Address

WHEN THE PRINCIPAL IS A CORPORATION:

Attest:

Katherine Buckley
Secretary

RF Environmental Services, Inc.
Name of Corporation

4840 NE 11th Avenue
Business Address

Fort Lauderdale, FL 33334

By: [Signature]
(Affix Corporate Seal)

Thaddeus Buckley
Printed Name

President
Official Title

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, Katherine Buckley, certify that I am the secretary of the Corporation named as Principal in the attached bond; that Thaddeus Buckley who signed the said bond on behalf of the Principal, was then President of said Corporation; that I know his signature, and his signature thereto is genuine and that said bond was duly signed, sealed and attested for and on behalf of said Corporation by authority of its governing body.

[Signature] (SEAL)
Secretary

Approved SOLICITATION Bond

TO BE EXECUTED BY CORPORATE SURETY:


Attest:



Witness, Jorge L. Bracamonte

Atlantic Specialty Insurance Company
Corporate Surety
605 Highway 169 North, Suite 800
Business Address
Plymouth, MN 55441



BY: 

(Affix Corporate Seal)
Jessie Sloan, Attorney-In-Fact &
Florida Licensed Resident Agent
Attorney-in-Fact

JCA Surety Group, LLC.
Name of Local Agency
123 Zelma Street, Suite A Orlando, FL 32803
Business Address

STATE OF FLORIDA

Inquiries: (321) 800-6594

Before me, a Notary Public, duly commissioned, qualified and acting, personally appeared,
Jessie Sloan to me well known, who being by me first duly sworn upon
oath says that he is the attorney-in-fact for the Atlantic Specialty Insurance Company !!!!! that
the has been authorized by Atlantic Specialty Insurance Company to execute the forgoing bond
on behalf of the CONTRACTOR named therein in favor of the City of Hollywood,
Florida. Subscribed and sworn to before me this 11th day of July, 2024



Karen Alvarenga
Notary Public, State of Florida

My Commission Expires: 08/22/2027

- END OF SECTION-





July 9, 2024

RF Environmental Services, Inc.
4840 NE 11th Avenue
Fort Lauderdale, FL 33334

Project: IFB-211-24-JJ - Replacement of Nanofiltration Process Pressure Vessels and Membrane Elements

Dear Thad,

The bid bond for the above referenced job has language on the bid bond form that implies you need to write out the percentage of your bid amount in dollar value on the bond form. Please let us know if you have any questions.

Thank you,

A handwritten signature in blue ink that reads 'Jessie Sloan'. The signature is fluid and cursive, with a large loop at the end.

Jessie Sloan
Contract Surety Account Manager
Inquiries: (321) 800-6594



Power of Attorney

KNOW ALL MEN BY THESE PRESENTS, that ATLANTIC SPECIALTY INSURANCE COMPANY, a New York corporation with its principal office in Plymouth, Minnesota, does hereby constitute and appoint: **Jorge L. Bracamonte, Jessie Sloan, Karla Tomaszewski**, each individually if there be more than one named, its true and lawful Attorney-in-Fact, to make, execute, seal and deliver, for and on its behalf as surety, any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof; provided that no bond or undertaking executed under this authority shall exceed in amount the sum of: **unlimited** and the execution of such bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof in pursuance of these presents, shall be as binding upon said Company as if they had been fully signed by an authorized officer of the Company and sealed with the Company seal. This Power of Attorney is made and executed by authority of the following resolutions adopted by the Board of Directors of ATLANTIC SPECIALTY INSURANCE COMPANY on the twenty-fifth day of September, 2012:

Resolved: That the President, any Senior Vice President or Vice-President (each an "Authorized Officer") may execute for and in behalf of the Company any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof, and affix the seal of the Company thereto; and that the Authorized Officer may appoint and authorize an Attorney-in-Fact to execute on behalf of the Company any and all such instruments and to affix the Company seal thereto; and that the Authorized Officer may at any time remove any such Attorney-in-Fact and revoke all power and authority given to any such Attorney-in-Fact.

Resolved: That the Attorney-in-Fact may be given full power and authority to execute for and in the name and on behalf of the Company any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof, and any such instrument executed by any such Attorney-in-Fact shall be as binding upon the Company as if signed and sealed by an Authorized Officer and, further, the Attorney-in-Fact is hereby authorized to verify any affidavit required to be attached to bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof.

This power of attorney is signed and sealed by facsimile under the authority of the following Resolution adopted by the Board of Directors of ATLANTIC SPECIALTY INSURANCE COMPANY on the twenty-fifth day of September, 2012:

Resolved: That the signature of an Authorized Officer, the signature of the Secretary or the Assistant Secretary, and the Company seal may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing an Attorney-in-Fact for purposes only of executing and sealing any bond, undertaking, recognizance or other written obligation in the nature thereof, and any such signature and seal where so used, being hereby adopted by the Company as the original signature of such officer and the original seal of the Company, to be valid and binding upon the Company with the same force and effect as though manually affixed.

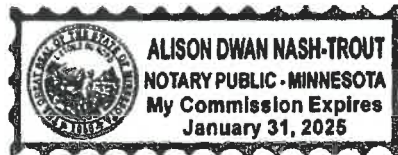
IN WITNESS WHEREOF, ATLANTIC SPECIALTY INSURANCE COMPANY has caused these presents to be signed by an Authorized Officer and the seal of the Company to be affixed this twenty-seventh day of April, 2020.



By *Paul J. Brehm*
Paul J. Brehm, Senior Vice President

STATE OF MINNESOTA
HENNEPIN COUNTY

On this twenty-seventh day of April, 2020, before me personally came Paul J. Brehm, Senior Vice President of ATLANTIC SPECIALTY INSURANCE COMPANY, to me personally known to be the individual and officer described in and who executed the preceding instrument, and he acknowledged the execution of the same, and being by me duly sworn, that he is the said officer of the Company aforesaid, and that the seal affixed to the preceding instrument is the seal of said Company and that the said seal and the signature as such officer was duly affixed and subscribed to the said instrument by the authority and at the direction of the Company.



Alison Nash-Trout
Notary Public

I, the undersigned, Secretary of ATLANTIC SPECIALTY INSURANCE COMPANY, a New York Corporation, do hereby certify that the foregoing power of attorney is in full force and has not been revoked, and the resolutions set forth above are now in force.

Signed and sealed. Dated 11th day of July, 2024.



This Power of Attorney expires
January 31, 2025

Kara Barrow
Kara Barrow, Secretary

Form 14
LIST OF SUBCONTRACTORS

The Respondent shall list below the name and address of each Subcontractor who will perform work under this Contract, and shall also list the portion of the work which will be done by such Subcontractor. After the opening of Submittals, changes or substitutions will be allowed with written approval of the City of Hollywood. Subcontractors must be properly licensed.

	Work to be Performed	Subcontractor's Name / Address
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____
6.	_____	_____
7.	_____	_____
8.	_____	_____
9.	_____	_____
10.	_____	_____

NOTE: Attach additional sheets if required.

- END OF SECTION -

FORM 15

INFORMATION REQUIRED FROM BIDDERS

GENERAL INFORMATION

The Bidder shall furnish the following information. Failure to comply with this requirement may cause its rejection. Additional sheets shall be attached as required.

1. Contractor's Name/Address: RF Environmental Services, Inc
4840 NE 11 Ave, Fort. Lauderdale, Fl 33334
Thaddaus Buckley

2. Contractor's Telephone Number: 954-603-6711
and e-mail address: AAviles93@yahoo.com

3. Contractor's License (attach copy): PLEASE SEE ATTACHED
Primary Classification: _____
Broward County License Number (attach copy): _____

4. Number of years as a Contractor in construction work of the type involved in this Contract: 8 years RF Environmental Services, Inc
28 years Thaddaus Buckley

5. List the names and titles of all officers of Contractor's firm:
Thaddaus Buckley - President
Katherine Buckley - Secretary & Treasurer.

6. Name of person who inspected site or proposed work for your firm:
Name: Kameron Young
Date of Inspection: June 13th, 2024

7. What is the last project of this nature you have completed?
SEE ATTACHED

8. Have you ever failed to complete work awarded to you; if so, where and why?

N/A

9. Name three individuals or corporations for which you have performed work and to which you refer:

Broward County: Oscar Asgar.

McCafferty Brinson: Frank Brinson

Hazen + Sawyer: George Wives

10. List the following information concerning all contracts on hand as of the date of submission of this proposal (in case of co-venture, list the information for all coventures).

Name of Project	City	Total Contract Value	Contracted Date of Completion	% Completion to Date
-----------------	------	----------------------	-------------------------------	----------------------

SEE ATTACHED

(Continue list on inset sheet, if necessary)

11. What equipment do you own that is available for the work?

• Diesel Generator • Concrete saw • Concrete chain saw

• 30 gal. Air compressor • Fork lift • Plate compactor

• Welding machine • Pressure washer • Percision Laser

• Pump • Table saw • 30 gal horizon Air comp • Industrial welder

12. What equipment will you purchase for the proposed work?

N/A

13. List at least three similar projects completed within the last five (5) years by the bidder and project manager. For the purpose of this requirement, "similar" projects shall be considered to include municipal drinking water, reverse

osmosis (RO) and/or NF membrane systems with a permeate capacity of 2.0 mgd or greater that have been commissioned within the past five (5) years and are currently in successful service. Also, list at least one RO or NF membrane system project that is fully installed within the past ten (10) years having an aggregate permeate production capacity of 5.0 mgd which is currently in successful service. Include Owner, project value, completion date, reference contact information, and brief project description. The determination of whether a project is sufficiently similar shall be at the sole discretion of the City.

Please see attached: Highlighted Jobs:
- Plantation East WTP Chemical Storage
- Hialeah WTP Lime Saker Replacement + Chem Bldg Rehab
- Broward County WTP 1A + 2A Treatment Unit Rehab

(Add sheets as requested.)

14. Name the Project Manager proposed for this project. Attach a copy of the project manager's resume.

Thaddeus Buckley - resume attached

NOTE: If requested by CITY, the Bidder shall furnish a notarized financial statement, references and other information, sufficiently comprehensive to permit an appraisal of its current financial condition.

++ END OF SECTION

FORM 16

PROPOSAL

TO THE MAYOR AND COMMISSIONERS
CITY OF HOLLYWOOD, FLORIDA

SUBMITTED 7/11/24

Dear Mayor and Commissioners:

The undersigned, as BIDDER, hereby declares that the only person or persons interested in the Proposal as principal or principals is or are named herein and that no other person than herein mentioned has any interest in this Proposal or in the Contract to be entered into; that this Proposal is made without connection with any other person, company or parties making a Bid or Proposal; and that it is in all respects fair and in good faith without collusion or fraud.

The BIDDER further declares that he has examined the site of the Work and informed himself fully in regard to all conditions pertaining to the place where the Work is to be done; that he has examined the Drawings and Specifications for the Work and contractual documents relative thereto, including the Notice to Bidders, Instructions to Bidders, Proposal Bid Form, Form of Bid Bond, Form of Contract and Form of Performance Bond, General, Supplementary and Technical Specifications, Addenda, Drawings, and Local Preference Program, Exhibit A, and has read all of the Provisions furnished prior to the opening of bids; and that he has satisfied himself relative to the work to be performed.

The undersigned BIDDER has not divulged to, discussed or compared his bid with other bidders and has not colluded with any other BIDDER of parties to this bid whatever.

If this Proposal is accepted, the undersigned BIDDER proposes and agrees to enter into and execute the Contract with the City of Hollywood, Florida, in the form of Contract specified; of which this Proposal, Instructions to Bidders, General Specifications, Supplementary Conditions and Drawings shall be made a part for the performance of Work described therein; to furnish the necessary bond equal to one hundred (100) percent of the total Contract base bid, the said bond being in the form of a Cash Bond or Surety Bond prepared on the applicable approved bond form furnished by the CITY; to furnish all necessary materials, equipment, machinery, tools, apparatus, transportation, supervision, labor and all means necessary to construct and complete the work specified in the Proposal and Contract and called for in the Drawings and in the manner specified; to commence Work on the effective date established in the "Notice to Proceed" from the ENGINEER; and to substantially complete all Contract Work within 30 days with final completion within 45 days, and stated in the "Notice to Proceed" or pay liquidated damages for each calendar day in excess thereof, or such actual and consequential damages as may result therefrom, and to abide by the Local Preference Ordinance, Exhibit A.

The BIDDER acknowledges receipt of the following addenda:

No. <u>1</u>	Dated <u>June 12, 2024</u>
No. <u>2</u>	Dated <u>July 3, 2024</u>
No. _____	Dated _____

And the undersigned agrees that in case of failure on his part to execute the said Contract and the Bond within ten (10) days after being presented with the prescribed Contract forms, the check or Bid Bond accompanying his bid, and the money payable thereon, shall be paid into the funds of the City of Hollywood, Florida, otherwise, the check or Bid Bond accompanying this Proposal shall be returned to the undersigned.

Attached hereto is a certified check on the

_____ Bank of _____

or approved Bid Bond for the sum of

4,139,000⁰⁰ Dollars (\$) according to the conditions under the Instructions to Bidders and provisions therein.

NOTE: If a Bidder is a corporation, the legal name of the corporation shall be set forth below, together with signature(s) of the officer or officers authorized to sign Contracts on behalf of the corporation and corporate seal; if Bidder is a partnership, the true name of the firm shall be set forth below with the signature(s) of the partner or partners authorized to sign Contracts in behalf of the partnership; and if the Bidder is an individual, his signature shall be placed below; if a partnership, the names of the general partners.

WHEN THE BIDDER IS AN INDIVIDUAL:

(Signature of Individual)

(Printed Name of Individual)

(Address)

WHEN THE BIDDER IS A SOLE PROPRIETORSHIP OR OPERATES UNDER A TRADE NAME:

(Name of Firm)

(Address)

(Signature of Individual) (SEAL)

WHEN THE BIDDER IS A PARTNERSHIP:

(Name of Firm) A Partnership

(Address)

By: _____
(SEAL)
(Partner)

Name and Address of all Partners:

WHEN THE BIDDER IS A JOINT VENTURE:

(Correct Name of Corporation)

By: _____ (SEAL)
(Address)

(Official Title)

As Joint Venture
(Corporate Seal)

Organized under the laws of the State of _____, and authorized by the law to make this bid and perform all Work and furnish materials and equipment required under the Contract Documents.

WHEN THE BIDDER IS A CORPORATION:

RF Environmental Services, Inc
(Correct Name of Corporation)

By: _____
(SEAL)

Thaddeus Buckley - President

(Official Title)

4840 NE 11 AVE, Fort Lauderdale FL
(Address of Corporation) 33334

Organized under the laws of the State of Florida, and authorized by the law to make this bid and perform all Work and furnish materials and equipment required under the Contract Documents.

CERTIFIED COPY OF RESOLUTION OF BOARD OF DIRECTORS

RF Environmental Services, Inc
(Name of Corporation)

RESOLVED that Thaddaus Buckley
(Person Authorized to Sign)

President - RF Environmental Services
(Title) (Name of Corporation)


be authorized to sign and submit the Bid or Proposal of this corporation for the following project:

Membrane Softening Plant Membrane Replacement at the Water Treatment Plant
Project Number: 23-4260
Bid No. IFB-211-24-JJ

The foregoing is a true and correct copy of the Resolution adopted by

RF Environmental Services
(Name of Corporation) at a meeting of its Board of

Directors held on the 11th day of July, 2024.

By: Thaddaus Buckley 

Title: President

(SEAL)

The above Resolution MUST BE COMPLETED if the Bidder is a Corporation.

- END OF SECTION -



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

07/09/2024

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 Brown & Brown Insurance Services, Inc. 1201 W Cypress Creek Rd Suite 130 Fort Lauderdale FL 33309		CONTACT NAME: Kemi Foster-Sterling PHONE (A/C, No, Ext): (954) 776-2222 FAX (A/C, No): (954) 776-4446 E-MAIL ADDRESS: Kemi.Foster-Sterling@bbrown.com	
		INSURER(S) AFFORDING COVERAGE	
		INSURER A: FCCI Insurance Company	NAIC # 10178
		INSURER B: Westchester Surplus Lines Insurance Company	10172
		INSURER C:	
		INSURER D:	
		INSURER E:	
		INSURER F:	
INSURED RF Environmental Services Inc, DBA: Milan Construction & Real Estate 4840 NE 11th Avenue Oakland Park FL 33334			

COVERAGES

CERTIFICATE NUMBER: 2022-25 COI

REVISION NUMBER:


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	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input checked="" type="checkbox"/> LOC OTHER:			GL10009354700	06/27/2024	02/27/2025	EACH OCCURRENCE	\$ 1,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	\$ 100,000
							MED EXP (Any one person)	\$ 5,000
							PERSONAL & ADV INJURY	\$ 1,000,000
							GENERAL AGGREGATE	\$ 2,000,000
							PRODUCTS - COMP/OP AGG	\$ 2,000,000
								\$
A	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS ONLY <input type="checkbox"/> NON-OWNED AUTOS ONLY			CA10009354800	06/27/2024	06/27/2025	COMBINED SINGLE LIMIT (Ea accident)	\$ 1,000,000
							BODILY INJURY (Per person)	\$
							BODILY INJURY (Per accident)	\$
							PROPERTY DAMAGE (Per accident)	\$
							UM CSL	\$ 300,000
A	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> DED <input checked="" type="checkbox"/> RETENTION \$ 10,000			UMB10009355100	06/27/2024	06/27/2025	EACH OCCURRENCE	\$ 3,000,000
							AGGREGATE	\$ 3,000,000
								\$
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N	N/A	WC010007021904	06/27/2024	06/27/2025	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER	
							E.L. EACH ACCIDENT	\$ 1,000,000
							E.L. DISEASE - EA EMPLOYEE	\$ 1,000,000
							E.L. DISEASE - POLICY LIMIT	\$ 1,000,000
B	Pollution Liability			G70971070003	10/24/2022	06/27/2025	Each Pollution	\$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)

City of Hollywood is an additional insured with respect to General Liability if required by written contract.

CERTIFICATE HOLDER**CANCELLATION**

City of Hollywood 2600 Hollywood Blvd Hollywood FL 33022	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 
--	--

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State of Florida

Department of State

I certify from the records of this office that RF ENVIRONMENTAL SERVICES, INC. is a corporation organized under the laws of the State of Florida, filed on January 28, 2016, effective January 27, 2016.


The document number of this corporation is P16000009528.

I further certify that said corporation has paid all fees due this office through December 31, 2024, that its most recent annual report/uniform business report was filed on February 14, 2024, and that its status is active.

I further certify that said corporation has not filed Articles of Dissolution.

*Given under my hand and the
Great Seal of the State of Florida
at Tallahassee, the Capital, this
the Fourteenth day of February,
2024*




Secretary of State

Tracking Number: 5698487124CC

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

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



Thad Buckley, President

Mr. Buckley has more than 20+ years of construction and engineering experience including work on water and wastewater treatment facilities, commercial and industrial HVAC and plumbing projects, and heavy duty industrial mechanical installations. In January 2016 Mr. Buckley founded RF Environmental Services, Inc. (RFES). Mr. Buckley has been responsible for the procurement and execution of water and wastewater treatment projects utilizing the Hard-Bid, CMAR and Design-Build delivery methods. By utilizing his knowledge and expertise in business and project development, estimating, design, start-up, testing and commissioning, and overall quality control for designing, estimating, construction, Mr. Buckley has procured and completed some of the most complex projects in the state. Mr. Buckley has had complete project responsibility for some of the most involved and technically challenging projects throughout Florida, from the largest membrane softening water treatment plant in the United States at 40-mgd to the installation of over 15,000 feet of 20"/24" steel pipe in the tarmac at Miami International Airport. Mr. Buckley has also served as the project executive for multiple, large scale, projects throughout the Tri-County area.

PERSONAL STATEMENT

"As a result of my tenure working for municipalities in the Tri-County area, I have developed long-standing relationships with many of the County's and City's construction and engineering staff. I understand and can exceed their expectations for project delivery."

OFFICE LOCATION

Miami & Fort Lauderdale, FL

EDUCATION

BS, Mechanical Engineering,
National University of
Florida, 1996

LICENSES/ REGISTRATIONS

Certified General
Contractor – FL,
#CGC1518671

Certified Mechanical
Contractor – FL,
#CMC1250334

Certified Plumbing
Contractor – FL,
#CFC1429319

Certified Pollutant Storage
Contractor – FL,
#PCC 1256939

MEMBERSHIPS/ AFFILIATIONS

Designated DBIA
Professional

Construction Association of
South Florida

Association of General
Contractors of America

Previous Relevant Work Experience

MWH Constructors, Inc., Florida Regional Manager (2012-2016)

While with MWH Constructors, Inc., Mr. Buckley helped establish the Company's "Hard-Bid" and "Self-Perform" capabilities. With MWHC's main office located in Broomfield, CO, it was Mr. Buckley's responsibility to establishing their Florida based estimating, project management, field staff and "self-perform" teams. These initial efforts culminated in the Award and Substantial Completion of the MWHC's first "Hard-Bid - at Risk" construction project in the Company's history. Mr. Buckley also acted as the Company's general construction, mechanical and plumbing qualifier for the work in Florida.

Pooler and Kent, Inc., Vice President (1996-2012)

Mr. Buckley started his professional construction career after graduation from the University of Florida with Pooler and Kent as an assistant project manager working at Miami-Dade County's Central District Waste Water Treatment Plant. Having worked there for 16 years Mr. Buckley performed every job required at Pooler and Kent from clerk to chief project estimator, and from superintendent to project executive. During this time at Pooler and Kent Mr. Buckley gained valuable experience in both general construction and mechanical cost estimating; and the detailed bidding requirements specific to the municipal water & wastewater treatment sector, including insurance and indemnification requirements and standards, bond requirements and construction risk allocation, and scheduling.

Relevant Project Experience

RFES Project Manager, North Regional WWTP Reclaimed Water Plant Expansion, Broward County, Broward, FL

Mr. Buckley led this effort as project manager. He produced initial and final cost estimates and managed purchasing and coordination of all major equipment and subcontractor packages; and performed general project oversight through all phases of construction. This \$10.6M project includes the furnish and installation of two (2) 2,500kw Gen-Sets, Sixty-Four (64) Dyna-Sand reuse filters, Two (2) Auto-

Backwash Strainers, Five (5) FRP Tanks, and Twelve (12) Re-Use and Filter Pumps.

RFES Project Manager, WTP Improvements, City of Pembroke Pines, Pembroke Pines, FL

Mr. Buckley led this effort as a project manager, he produced initial and final cost estimates and managed the proposal, design, purchasing and coordination of all major design, process equipment and subcontractor packages. Was directly responsible for assembling the design and construction teams on this project. After completing the design phase, he turned over day-to-day operations of the construction activities to the on-site project management team. This \$2.9M project entailed installation of new air scour system on (16) Greenleaf Filter Cell including new blower and air distribution header throughout the water treatment plant.

RFES Project Manager, WTP Lime Feed System Refurbishment, SCC Valve Insertion and Mag-Flow Meter Insertion, City of Pembroke Pines, Pembroke Pines, FL

This \$3.1 million project entails the refurbishment of lime systems No. 1 and 2. Mr. Buckley produced initial and final cost estimates and managed purchasing and coordination of all major equipment and subcontractor packages; and performed general project oversight through all phases of construction. The contract includes the installation of two new slakers, including new lime slurry feed tanks, new slurry feed pumps. Replacement of the lime slurry pumps at Silo No. 3, provide rehabilitation to Silos No. 1 and No. 2. Excavate, cut and install (3) new isolation valves.

RFES Project Manager, WTP 1A and 2A Treatment Unit Rehabilitations, Broward County, Broward, FL

Mr. Buckley led this effort as a project manager, he produced initial and final cost estimates and managed the proposal, design, purchasing and coordination of all major design, process equipment and subcontractor packages. Was directly responsible for assembling the design and construction teams on this project. After completing the design phase, he turned over day-to-day operations of the construction activities to the on-site project management team. This \$1.8M project entailed the rehabilitation of existing Lime Treatment Unit #2 at WTP 2A and Lime Treatment Unit #1 at WTP 2A, including 36" Pipe repair.

RFES Project Manager, Sodium Hypochlorite and CO2 Injection System, City of Pembroke Pines, Pembroke Pines, FL

This \$2 million project entails the installation of a Sodium Hypochlorite and Carbon Dioxide Injection System. Mr. Buckley produced initial and final cost estimates and managed purchasing and coordination of all major equipment and subcontractor packages; and performed general project oversight through all phases of construction. The contract included the replacement of components of (2) sodium hypochlorite injection triplex skids, replacement of sodium hypochlorite transfer pump including all electrical cables and piping.

Project Executive (PK), South District WWTP Cogeneration Facility Improvements, Miami-Dade Water & Sewer Department, Miami, FL

Mr. Buckley led this effort in a Principal-in-Charge capacity by managing a team of project managers and engineers during the RFQ, RFP, Design & Construction phases of the project. He produced initial and final cost estimates and managed the proposal, design, purchasing and coordination of all major design, process equipment and subcontractor packages. This included design service agreements in the amount of \$2M, cogeneration system equipment package worth \$4M and a \$3.5M electrical system subcontract agreement.

Project Executive, Belle Glade Wastewater Treatment Plant Improvements, Glades Utility Authority, Belle Glade, FL

Mr. Buckley led this effort in a Principal-in-Charge and Lead Estimator capacity by managing the team of project managers, field staff and estimators. He produced initial and final cost estimates and managed purchasing and

coordination of all major equipment and subcontractor packages; and performed general project oversight through all phases of construction. This \$1.6M project includes the installation of bar screen covers, oxidation ditch splash guards, sodium hypochlorite feed system and piping, automatic slide gate and fencing; the modifications of the headworks piping, deep injection well effluent piping, weir; and purchase of outdoor refrigerated samples, WAS pumps, and sludge pumps.

Project Executive, South District WWTP Cogeneration Facility Improvements, Miami-Dade Water & Sewer Department, Miami, FL

Mr. Buckley led this effort in a Principal-in-Charge capacity by managing a team of project managers and engineers during the RFQ, RFP, Design & Construction phases of the project. He produced initial and final cost estimates and managed the proposal, design, purchasing and coordination of all major design, process equipment and subcontractor packages. This included design service agreements in the amount of \$2M, cogeneration system equipment package worth \$4M and a \$3.5M electrical system subcontract agreement. He was also directly responsible for assembling the design and construction teams on this project. After completing the design phase, he turned over day-to-day operations of the construction activities to the on-site project management team. This \$20M project entailed the upgrade to the existing Cogeneration System at the South District WWTP including design, permitting, supply, fabrication/installation of (5) new cogeneration units and associated 5kV electrical systems, as well as combustion gas pre-treatment systems, exhaust and engine cooling water heat recovery systems for the digested sludge treatment process and the combustion air cooling through the use of an absorption chiller and hot oil recirculation.

Project Executive, South District WWTP HLD Upgrade to 285-mgd Filter System, Miami-Dade Water & Sewer Department, Miami, FL

Mr. Buckley, as part of the executive bid team on this project, performed the pre-bid estimating for all the wastewater treatment plant process equipment on this project. Then after contract award, acting as a project executive purchased, coordinated and scheduled the delivery all major process equipment for this project, including: (16) 200 hp Backwash Pumps, (7) 500 hp blowers, (12) mixers, switchgear, transformers, MCCs, (161) 24-inch motor operated control valves, (35) flow meters, (43) level transmitters, and multiple local control panels, and the process instrumentation package. These responsibilities included negotiating subcontract and purchase order terms and conditions with both contractor selected and Owner "sole-source" vendors and subcontractors, assuring that Miami-Dade County contract requirements were including in all subcontractor and vendor agreements. This \$135M project, part of the \$628M high-level disinfection project currently underway at the South District WWTP, entailed the construction of one of the largest deep bed sand filter systems in the US.

Project Executive, South District WWTP Fat, Oil & Grease Septage Facility, Miami-Dade Water & Sewer Department, Miami, FL

Mr. Buckley, as part of the executive bid team on this project, performed the pre-bid estimating for all of the wastewater treatment plant process equipment on this project. After contract award, he acted in a project executive role and purchased, coordinated, and scheduled for delivery all major process equipment for this project, including: grit pumps, overflow & flushing water pumps, slide, weir & sluice gates, submersible pumps, grit classifiers, mechanical bar screens, odor control systems, chemical systems, motor operated control valves, flow meters, level transmitters, local control panels, and the process instrumentation package.

Project Executive, Belle Glade Wastewater Treatment Plant Improvements, Glades Utility Authority, Belle Glade, FL

Mr. Buckley led this effort in a Principal-in-Charge and Lead Estimator capacity by managing the team of project managers, field staff and estimators. He produced initial and final cost estimates and managed purchasing and coordination of all major equipment and subcontractor packages; and performed general project oversight through all

phases of construction. This \$1.6M project includes the installation of bar screen covers, oxidation ditch splash guards, sodium hypochlorite feed system and piping, automatic slide gate and fencing; the modifications of the headworks piping, deep injection well effluent piping, weir; and purchase of outdoor refrigerated samples, WAS pumps, and sludge pumps.

Project Executive, Hollywood Water Treatment Plant Electrical Power Generator System Expansion, Hollywood, Florida

This \$1.7 million project entails the construction of expansion of the generator system at the existing water treatment plant. Mr. Buckley produced initial and final cost estimates and managed purchasing and coordination of all major equipment and subcontractor packages; and performed general project oversight through all phases of construction. The contract includes the installation of a new 1500 kW, 13.2 kV diesel engine generator set in the existing Generator Building, modifications to the existing switchgear, low voltage MCC, and generator control system; the installation of new component panels for the existing generator section and a new door/panel for the master control section; modifications to existing SCADA systems; installation of a new fuel supply system, new engine cooling system and insulated piping; and removal of modified bitumen roofing and replacing with a new EPDM membrane roofing system.

Project Executive, Hollywood Water Treatment Plant Membrane Replacement, Hollywood, Florida

Mr. Buckley led this effort in a Principal-in-Charge capacity by managing the team of project managers and field staff. He produced initial and final cost estimates and managed purchasing and coordination of all major equipment and subcontractor packages; and performed general project oversight through all phases of construction. This \$1.7M project entails the removal and replacement of the nano-filtration membrane elements in the seven existing membrane softening trains at the existing water treatment plant.

Project Executive, Wastewater Repump Stations A, B & E Rehabilitation, City of Fort Lauderdale, FL

Mr. Buckley led this effort in a Principal-in-Charge capacity by managing a team of four project managers and field staff which were charged with completion of all of the City of Fort Lauderdale work being completed concurrently at the time. In this role Mr. Buckley was a key factor in keeping all these projects on schedule and under budget by mitigating subcontractor and vendor claims and changes orders to the fullest extent possible. He produced initial and final cost estimates and managed purchasing and coordination of all major equipment and subcontractor packages; and performed general project oversight through all phases of construction. This \$11.7M project entailed the rehabilitation of three re-pump stations for the City of Fort Lauderdale. All electrical and mechanical equipment was replaced and upgraded including generators. All wastewater ductile iron pipelines associated with each respective pump station were replaced as well. A bypass system was installed to help manage the system flow at each pump station. Each station required a system shutdown to install the ductile iron pipe required during the allotted time frame. Major equipment for this project included: four 450 hp horizontal non-clog pumps, one 2,000 kw diesel-electric generator, one 900 kw diesel-electric generator, one 8,000 gallon above-ground fuel storage tank, four 250 horizontal non-clog pumps, three 60 hp horizontal non-clog pumps, four 160 V VFDs, and seven 480 V VFDs.

Project Executive, G.T. Lohmeyer WWTP Pumping System Improvements, City of Fort Lauderdale, FL

Mr. Buckley led this effort in a Principal-in-Charge capacity by managing a team of four project managers and field staff which were charged with completion of all of the City of Fort Lauderdale work being completed concurrently at the time. In this role Mr. Buckley was a key factor in keeping all these projects on schedule and under budget by mitigating subcontractor and vendor claims and change orders to the fullest extent possible. He produced initial and final cost estimates and managed purchasing and coordination of all major equipment and subcontractor packages; and performed general project oversight through all phases of construction. This \$12.5M project entailed the following: replacement and upgrade of all field instrumentation, the replacement of the 750 kva generator with a new 1,200 kva generator and motor control center, and upgrade the fuel storage tank to current Building Code standards. At Pump Station No. 1, P&K replaced three 10-inch sewage pumps with three 10-inch horizontal sewage pumps. At Pump Station No. 2, P&K replaced three sewage pumps with three 8" vertical pumps. At Pump Station No. 3, P&K replaced all three 6-inch sewage pumps with three 6-inch vertical pumps. At the dewatering building, P&K replaced all eight sludge pumps with new 6-inch sludge pumps. At the Effluent Pump Station, P&K replaced all three non-potable water pumps.

Project Executive, Waste Management CNG Fueling Facility, Waste Management, Pompano Beach, FL

Mr. Buckley led this effort in a Principal-in-Charge capacity by managing the team of project managers, estimators and field staff. He produced initial and final cost estimates, negotiating the contract with the prime contractor who was working for Waste Management. During construction he managed purchasing, coordination of all major equipment and subcontractor packages and performed general project oversight through all phases of construction. This \$1.7M design-build project included the installation of a new water main under the existing truck parking area. Additionally, the project requires the installation of a new compressed natural gas system including equipment, piping, and remote fueling stations for mechanical, electrical and civil systems.

Project Executive, Peele-Dixie Membrane Plant, City of Fort Lauderdale, FL

Mr. Buckley led this effort in a Principal-in-Charge capacity by managing a team of four project managers which were charged with completion of all of the City of Fort Lauderdale work being completed concurrently at the time. In this role Mr. Buckley was a key factor in keeping all these projects on schedule and under budget by mitigating subcontractor and vendor claims and changes orders to the fullest extent possible. He produced initial and final cost estimates and managed purchasing and coordination of all major equipment and subcontractor packages; and performed general project oversight through all phases of construction. This \$27.3M project entailed the construction of the 12-mgd membrane softening water treatment facility at the existing plant which was built in 1926. In addition to the membrane facility, the project involved building generator and chemical buildings and installed four membrane process skid units each with 77 pressure vessels. The major components of the work included the installation of one 300 hp variable speed membrane feed pump, four raw water cartridge filters, a new high service pump station with five 250 hp vertical turbine high service pumps, three 60 hp transfer pumps, a new chemical tank farm, a metering pump building, and two 1750 kva emergency diesel generators.

Project Executive, Southern Regional WWTP Oxygen System Upgrade, City of Hollywood, FL

Mr. Buckley led this effort in a Principal-in-Charge capacity by managing a team of project managers and engineers during the RFQ, RFP, Design & Construction phases of the project. He produced initial and final cost estimates and managed purchasing and coordination of all major equipment and subcontractor packages; and performed general project oversight through all phases of construction. Mr. Buckley also played a key role in keeping all the projects on schedule and under budget by mitigating subcontractor and vendor claims and changes orders to the fullest extent possible. This \$10M design-build project rehabilitated the existing 64 TPD oxygen generation system for the City of Hollywood. The scope of the project included the preliminary and final design, permitting, and construction of the following project components: replacements of the dual 1,250 hp air compressors with three 900 hp units; rehabilitation of two existing LOX storage tanks and piping; rehabilitation of existing cryogenic oxygen generation system; installation of three new ambient air vaporizers, new instrument air compressor, and new instrument air piping; replacement of various piping systems with carbon steel, PVC, 316 stainless steel, and monel stainless steel, and miscellaneous site work. This project required meticulous up-front planning and scheduling, as well as extremely close coordination with the plant operating staff as the SRWWTP is an operating facility.

Project Manager, Fiveash Water Treatment Plant Upgrades – Phase 1, Ft. Lauderdale, FL.

This \$12.5 million project upgraded the entire water treatment plant's instrumentation and control system from the existing pneumatic control system to the state-of-the-art PLC and fiber optic control system. This required the replacement of more than 250 automatic control valves and the associated piping throughout the water treatment plant, including (11) on each of the (22) existing gravity filters. The project also involved replacing the main plant's core control system, installing four new lime slakers with new controls and instrumentation, two 200 HP high service pumps, new polymer distribution system with four new polymer feed pumps, a new lime sludge thickening tank with three submersible pumps, a new aqueous ammonia storage tank and pump building with two 10,000 gallon steel storage tanks and four metering pumps, and miscellaneous valves and control upgrades throughout the plant.

Project Manager, Fiveash Water Treatment Plant Filter Rehabilitation, Ft. Lauderdale, FL.

This \$2.4 million project entailed the rehabilitation of six of the existing (22) filters at the Fiveash Water Treatment Plant under the WaterWorks 2011 program. During the completion of the contract work, the City of Fort Lauderdale increased our scope of work from six to ten filters. Each of the ten filter rehabilitations included removal of the existing filter internals, including the underdrain system, media and surface wash piping. The inside concrete surfaces of all rehabilitated filters

were refinished and prepared for the new underdrain and media installation. A new 316 stainless steel surface wash system was installed in each filter, and each pair of rehabilitated filters was tested, disinfected, and placed back into operational service within six weeks of being taken out of service.

Project Manager, Glades Road WTP 40-mgd Membrane Softening Process Addition, Boca Raton, FL.

This \$49.6 million project included the construction of a 40-mgd Membrane Softening Water Treatment Facility which included the installation of degasifiers, odor control system, and three 1.5 mW generators. To this date this facility remains one of the largest nano-filtration water treatment facilities in the world, having (12) membrane process skid units each with 96 pressure vessels and one 200 HP variable speed membrane feed pump. Also included under the scope of construction for this project was (4) raw water pressure filters rated for a total flow of 47-mgd, a new raw water booster pump station with (6) 250 HP constant speed pumps, a new high service pump station with (2) new dual drive high service pumps rated at 700 HP and 1200 HP, (3) new 100 HP vertical turbine transfer pumps, a new chemical tank farm and metering pump building, a new generator and switchgear building.

Project Manager, G.T. Lohmeyer WWTP Effluent Pump Station, Ft. Lauderdale, FL.

This \$6.2 million project required the replacement of five deep well injection pumps. This project was particularly challenging as there was no effective way to isolate the wastewater treatment plant from the effluent pump station, as such all work during scheduled shut-downs had to be closely coordinated at night during low-flow conditions and could not exceed (4) hours. Construction consisted of the following elements: installation of two 1,250 HP – 15,200 GPM and three 1,750 HP – 22,800 GPM, 4,160 volt electric non-clog centrifugal pumps a new effluent pump control system, including new PLC's; wet well level controls, MMI systems and software, and a state-of-the-art pump monitoring system, measuring four temperatures and four vibration readings on each pump and motor. The project involved constructing a new electrical service distribution system for the new pumps, including a FPL vault, VFD control room, and all required HVAC systems

Project Manager, Glades Road Sodium Hypochlorite Generation System, Boca Raton, FL.

This \$4 million project included the following: demolition of the existing chlorine gas storage, handling and feed systems; rehabilitation of the existing chlorine storage area and chlorinator room; modifications to receive the new on-site generation and feed equipment; two 70-ton salt/brine tanks each equipped with a salt truck off-loading station and brine make-up water softener system; three 1,500 pound per day (ppd) electrolytic on-site sodium hypochlorite generation units; five 18,500 gallon sodium hypochlorite solution storage tanks; and six hypochlorite metering pumps (each equipped with variable frequency drives); and all associated sitework, yard piping, electrical, instrumentation, and controls improvements.

Additional Project Manager Experience:

Glades Road Wastewater Treatment Plant Sludge System Improvements, Boca Raton, Florida, 2003

Springtree Water Treatment Plant, Sunrise, Florida, 1998

9th Street Pump Station Improvements, Miami, Florida, 1998

Central District WWTP Oxygenation Generation, Miami, Florida, 1996

Central District WWTP Odor Control Facility No. 5, Miami, Florida, 1996

Bal Harbour Pumping Station, Miami, Florida, 1997

Alexander Orr WTP Softening Modifications, Miami, Florida, 1997

World Ford, Hollywood, Florida, 1999

Broward County Libraries Energy Conservation and Ice Storage Facility, Broward County, Florida, 1999

Miami International Airport Concourse "E" Satellite Extension Tunnel and Utility Corridor, Miami, Florida, 1999

Miami International Airport Concourse "J", Miami, Florida, 2000

Miami International Airport South Terminal Expansion, Miami, Florida, 2000

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West Palm Beach, FL 33412

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Membrane WTP's are Highlighted

Project Management / Supervision

Planning, Coordination, Material procurement, Time management, OSHA and EM 385 (US Army Corps of Engineers) Compliance, Manpower loading and Forecast scheduling from Mobilization to Milestones into Substantial & Final Completion. Excellent ability to decipher contracts, drawings with specifications, submittals, shop drawings and surveys. Maintaining As-Built drawings. Dedicated to delivering quality finished product within budget. Experienced in the Procurement and Compliance of building and dewatering permits. Scheduling of Inspections by appropriate Municipalities and Engineer representatives.

Work History

Harry Pepper & Associates Project (General) Superintendent	2011 – 2012
Poole & Kent Company of Florida Project Superintendent	1997 – 2011
Tripp & Associates Project Superintendent	1995 – 1997
Widell & Associates, Inc. Project Superintendent	1987 – 1995
Tripp & Associates Project Superintendent	1984 – 1987
Widell & Associates, Inc. Project Superintendent	1978 – 1984
Grumman Eco-Systems Millwright	1976 – 1978

Experience

Survey

Jobsite Layout and Elevations with Digital Theodolite Transits (Total Stations) and Leica GPS-900 System from Bench Marks / Monuments

Pipe Laying / Pipe Fitting / Plumbing

Ductile Iron (ACIPCO)	Fastite, Flex ring, M.J., Flanged, VIC-Grooved, Field-Flex, Lok-Ring
Steel & Stainless Steel	Threaded, VIC-Grooved, Welded, Flanged
Cast Iron	Hub and No Hub couplings
Copper	Solder Joints (water, air and refrigeration)
Brass	Threaded and Welded
PVC and CPVC	Threaded, Glue, VIC-Groove, Welded
HDPE	VIC-Groove, Flanged, Fusion
R.C.P.	Assembly with testable joints underwater (Price Bros / Hanson)
Concrete	Drainage structures and conduit
Corrugated Metal	Steel and Aluminum
Fiberglass	Ductwork

Concrete

Forming	Using panels with taper-ties and snap-ties (Symons) (Patent) (Economy) plywood Keyways and bulkheads with PVC or Steel waterstop
Placement	Using truck-mounted booms, Hydraulic trailer pumps – crane / bucket
Finishing	Screeds, Laser leveling, vibration, power trowelling machine, hand float, trowel, edging, N.S. grouting of equipment bases, point & patch, sponge rubbing
Cutting	Blade and diamond chain saw and cord drilling, demolition, hydraulic and pneumatic hammers
Reinforcement	Bending, Placement

Carpentry

Rough	Forming for concrete with plywood/lumber. Wood & steel framing for houses, garages, barns. Setting and alignment of roof trusses (wood & steel). Hang and finish drywall. Wood fencing.
Finish	Hanging of doors, frames and hardware (wood, steel & fiberglass). Installation of cabinets, counters and vanities. Wood paneling and trim.

Equipment Operation

CDL Class "A" Safe Driver Florida License

Crane	Boom trucks, carry deck, hydro (all terrain & truck/carrier), friction (track) using drag, clam and concrete buckets. Sheet piling diesel hammer, vibratory sheet pile driver/extractor, hydraulic auger for cast in place piling.
Excavators	Track-hoe (full size and mini), rubber tire combination, dozer, wheel loader, grader, skid-steer loader with hoe, breaker and broom attachments), tractor with box blade.
Compaction	Jumping Jack rammer, reversible plate, single drum (ride on) vibratory
Forklift	Warehouse lift truck, straight mast rough terrain, shooting boom rough terrain

Welding

AC/DC, MIG/TIG/Stick

Cutting

Carbon Arc, Plasma, Oxygen and Acetylene

Installation, Leveling and Alignment of:

R.O. and De-saltation Membranes
Generators, Silencers, Fuel systems
Pumps, Motors, Piping
Gantry systems
Air compressor systems
Vacuum pump systems
Chlorination and chemical feed systems
Turbine generator

Barscreens (Parkson)
Primary & Secondary Clarifiers
Lime Slakers
Sodium Hypochlorite Generator
Pressure sand filter (Roberts)
Odor control and degasifiers
Fire sprinkler systems
Irrigation systems

Experience developed from:

Construction of WTP and WWTP
Pumping Stations and Pipe Laying
Sheet Piling Cofferdams w/tremie seals
Wellpoint Dewatering Systems
Open pumping with under-drain systems
A/C and Refrigeration Equipment
Commercial Buildings (single and multi-story)

Shopping Centers and Convenience Stores
Above ground fuel storage systems
Service Stations and Fuel Islands
Steel Buildings and their foundations
Concrete steel and fiberglass tanks
Truck Weighing Stations
Custom multi-million dollar homes

<p>Bonita Springs Water Reclamation Facility, Bonita Springs, FL – cont'd Fred May - Senior PM (941) 875-1592 Pat Jennings (239) 992-0711 Katos Watson – PM (239) 707-6173 Gary - Project Supt (239) 707-6172</p>	
<p>Poole & Kent Company of Florida Wastewater/Water Treatment Plants Project / Job Details:</p>	<p>1997 - 2011 Project Value</p>
<p>G.T. Lohmeyer WWTP Effluent Pump Station - Ft. Lauderdale, FL CH2MHill Camp, Dresser McGee Chief Operator Larry Bower - PMT Jeff Manning John McGeary (954) 520-1713 (954) 448-3807 (954) 523-1002</p>	<p>\$8M</p>
<p>Palm Beach County Membrane Plant No. 9 - Boca Raton, FL Palm Beach County Utilities Bill Latinsky (561) 541-0754</p>	<p>\$25M</p>
<p>Tequesta Water Treatment Plant - Tequesta, FL Reese, Macon & Associates (561) 433-3226 Bill Reese (561) 248-3226 wreese@Arcadis-us.com Jim Macon Dale Scott – PM</p>	<p>\$5.5 M</p>
<p>Sawgrass WWTP Expansion and Biosolids Facility - Sunrise, FL Camp, Dresser, McGee (954) 776-1731 City of Sunrise Larry Martin – Senior PM (941) 656-5211 Chris Helfrich - Finance Jim Crane – S FL Mgr Walter Garrard – Adm Control Ben Cinquegrana – Project Inspector Chuck Irvine – Adm Control Robert Trautman – Project Inspector Tony Yates – Adm Control</p>	<p>\$24M <i>This reflects a \$4M change order</i></p>
<p>Springtree Water Treatment Plant - Sunrise, FL Montgomery Watson - Engineer City of Sunrise Albert Weidner – Project Inspector (954) 572-2424 Chris Helfrich - Finance Howard Rupper – Chief Operator Walter Garrard – Adm Control Chuck Irvine – Adm Control Tony Yates – Adm Control</p>	<p>\$16M</p>
<p>Alexander Orr Water Treatment Plant - Miami, FL Miami Dade Utilities Murray Grant – Utilities Director Alfredo Sanchez – Field Inspector</p>	<p>\$14.2M</p>
<p>Alexander Orr Lime Kiln Improvements - Miami, FL Miami Dade Utilities Murray Grant – Utilities Grant Alfredo Sanchez – Field Inspector</p>	<p>\$2.5M</p>
<p>Tripp & Associates Responsibility – Project Superintendent Projects / Job Detail</p>	<p>1995 – 1997 Project Value</p>
<p>Turbine Generator Facility Superstructure 42' Wx82' Lx60' Tall steel I-Beam structure with 30 ton gantry crane. Mid-elevation concrete operating floor around 10.5 mil-amp steam turbine generator on pedestal base with lower level grading deck for switchgear and lubrication system. Structure enclosed with concrete block with formed columns and beams. Building featured 110 ton chilled water ventilation system with code 850 (fire) smoke or steam discharge system.</p> <p>Condenser Cooling Tower Circulation Pumps and Piping Paired 26" steel pipes on steel support frames (20' off ground) with expansion support guides. From turbine generator building to cooling tower. Installed three base mounted split-case horizontal circulation pumps with steel suction piping and stainless strainers and wall embedded sleeve.</p>	<p>\$1.7M</p>

<p>Condenser Cooling Tower Circulation Pumps and Piping – cont'd Hutcheon Engineers 4431Embarcadero Dr West Palm Beach, FL (561) 845-0665 Robert Howl, Kirk Drost, Anthony Sulkowski</p> <p>Sugar Cane Growers Co-Op – Belle Glade (561) 996-5556 Vice President: Jose Alvarez New Construction Control: Bob Mattox</p>	
<p>Tripp & Associates Responsibility – Project Superintendent Projects / Job Detail</p>	<p>1995 – 1997 Project Value</p>
<p>Belle Glade Transfer Station Project #SWA 95-240/JMD, Palm Beach, FL Solid Waste Authority Project consisted of two concrete structure contained truck scales with approach slabs on either side of scale house/administration building with overhead concrete double tee porch. Transfer building 100'x120' formed concrete structure with steel building upper structure. Split-level structure with two semi-truck drive-thru lanes with approach aprons and axle scales. HDR Engineering, Inc Tampa, FL Neal Potteet (813) 282-2383</p> <p>SWA Engineer Jack Mesojedec P.E. Brent Headberg - Project Inspector (561) 640-4000</p>	<p>\$3.3M</p>
<p>Process Water Pumping Station and Transfer Main Project consisted of open pumped excavation. Poured in place concrete 14'x35'x25' depth structure with 16' walls on 36" ballast foundation. 60" influent slide gate and FMC revolving self -cleaning screen filter with two 100HP vertical pumps discharging into 16" PVC ½ mile long transfer main to sand filters. Sugar Cane Growers Cooperative of Florida 1995 Mill Expansion 160 Airport Rd Belle Glade, FL</p> <p>Global Tech, Inc. P.O. Box 2487 Boca Raton, FL (561) 368-2713</p>	<p>\$380K</p>
<p>Filtered Mud Recovery System Project consisted of two skid mounted transfer pump stations with all steel discharge piping draining to them. These stations transferred mud slurry to main exterior steel mixing tank with vari-speed centrifugal pumps transferring back through steel piping to primary filters.</p>	<p>\$550K</p>
<p>Widell & Associates Responsibility – Project Superintendent Projects / Job Detail</p>	<p>1987 – 1995 Project Value</p>
<p>Hood Road Water Treatment Plant Modifications, Palm Beach Gardens, FL Seacoast Authority Project consisted of demolition of the existing valve-less filter train system dewatering and installs tapping saddle on existing 60" R.C.P. connecting to two vari-speed high service pumps in cans with discharge yard piping. Demolition of existing steel precipitator and concrete foundation construction of new 70' concrete accelerator softener tank. Relocated lime system on existing high service pumps. Reese, Macon and Associates, Inc. 6415 Lake Worth Rd, Suite 307 Lake Worth, FL Bill Reese P.E. James Macon P.E.</p>	<p>\$1.87M</p>

<p>Reclaimed Water Facility, Palm Beach Gardens, FL Seacoast Utility Authority PGA Wastewater Treatment Plant Project consisted of new filter feed pump and yard piping to tertiary filters. New chlorine handling facility. 375 linear ft. of 30" D.I.P. through storage ponds #11 and #12. 30'Lx16'Wx16'D pump station with 150HP pumps and jockey pump. 24" discharge header and force main through plant. Engineering Concepts in Design, Inc. 1080 E. Indiantown Road, Suite 202 Jupiter, FL John C. Whitmer P.E. Eric Crawford P.E.</p>	<p>\$961K</p>
<p>Widell & Associates Responsibility – Project Superintendent Projects / Job Detail</p>	<p>1987 – 1995 Project Value</p>
<p>WWTP Expansion Sludge Treatment Facility, Broward County, FL Project consisted of concrete building containing sludge boilers, sludge transfer pumps and gas-blowers with connecting piping to two floating cover sludge digesters with mixing cannons inside. Steel gas piping was laid to existing digesters with new cannons. Camp, Dresser & McKee, Inc. James Holly - Assistant Engineer (305) 776-1731</p>	<p>\$7.82M</p>
<p>Wastewater Effluent Irrigation Facility, City of Pompano Beach, FL Project consisted of two million gallon Crom ground storage tank that was given the <i>Award of Excellence for Distinguished Architectural Treatment in Pre-Stressed Concrete Tank Construction</i> by Portland Cement Association. An esthetic matching control building with chemical equipment. A Parkson four well sand filter. A multi-horsepower irrigation pump station approximately one mile of 16" D.I.P. distribution main south through golf course. Eckler Engineering (954) 755-1351 Don Eckler P.E. Robert Ruthmeyer - Field Inspector</p>	<p>\$3.25M</p>
<p>Wastewater Treatment Plant Expansion, City of Royal Palm Beach, FL Project consisted of 200' oval racetrack aeration basin with two 60' clarifiers and combination contact tank with deep well pump station. Responsibilities began with structural and mechanical foreman but completing the project as superintendent. Craig A. Smith & Assoc, Inc. (954) 782-8222</p>	<p>\$2.7M</p>
<p>Tripp & Associates Responsibility – Project Superintendent Projects / Job Detail</p>	<p>1984 – 1987</p>
<p>S & M Distributors (Farmers Market) Pompano Beach, FL 35,000 sq. ft. steel building; re-skin and divide into storage coolers with insulation and refrigeration. Addition of 3,800 sq. ft. ripening rooms on north truck loading dock.</p>	
<p>J.R. Brooks and Son 18400 SW 256th St. Homestead, FL 3,800 sq. ft. foundation and fabrication of steel tubing mainframe and mid rack of insulated/refrigeration steel building for tropical produce ripening. Mike Hevener Operations Manager (305) 247-3544</p>	
<p>Winn Dixie Shopping Center Expansion (30,300 sq. ft.) – Royals Properties, Inc. Turn-key completion of Scotty's Hardware, Cato's Clothing.</p>	
<p>Thriftway Food Supermarket, Clewiston, FL Rebuild 25% structural concrete and 40% of roof trusses as result of fire damage.</p>	
<p>Glades Middle School – Airport Rd, Belle Glade, FL 5,500 sq. ft. boys and girls locker room addition to existing gym.</p>	
<p>Big B Ranch – State Rd 27 (South Bay Sugar Cane Grower) Single story 6,100 sq. ft. CBS office and storage building</p>	
<p>Bernie Little Beer Distributors – Belle Glade, FL Steel building addition. Piling foundation and forklift ramp and new cooler area.</p>	

<p>Consolidated Chemical, Inc. – Lake Harbor, FL Fairbanks-Morris truck scale and gauge house. Stand up wall fertilizer storage Building.</p>	
<p>Timesaver Convenience Store & Covered Fuel Island – Belle Glade, FL Kirchman Oil Corp – State Rd 80 & Tabit Rd., Belle Glade, FL (561) 996-2033</p>	
<p>Timesaver Convenience Store & Covered Fuel Island – South Bay, FL Kirchman Oil Corp – State Rd 80 & Tabit Rd., Belle Glade, FL (561) 996-2033</p>	
<p>Western Auto Plaza 32,000 sq. ft. two-story commercial building addition. Owner: Tom Bonavita</p>	
<p>Widell & Associates Responsibility – Mechanical and/or Structural Foreman Projects / Job Detail</p>	<p>1978 – 1984</p>
<p>Water and Wastewater Plants, South Broward Utility Company Waitz and Frye Consulting Engineers Under piping and encasement, yard piping, onsite lift station and discharge main.</p>	
<p>Wastewater Treatment Plant, Port La Belle, FL Installed transfer pumps and yard piping. Installed Hoffman blowers and air piping to diffuser manifold of main multi-tank.</p>	
<p>Wastewater Treatment Expansion, Collier City, FL PRC Engineering, Inc. (813) 774-4999 Installed and aligned race-track aerator. Basin mixer shaft units and yard piping at splitter box. Installed vacuum units piping basin tile blocks of Dehydro process (sludge dewatering) Infilco basin.</p>	
<p>Wastewater Treatment Plant Softener Expansion, Pembroke Pines, FL After Tampa tank erected two accelerator mixing tanks on Widell foundations, we complete sludge blow-off piping and valves and yard piping.</p>	
<p>Sewage Re-pump Station, City of Ft. Lauderdale, FL Williams, Hatfield and Stoner, Inc. Assembly of by-pass pumps and piping. Gutting station. Installed new pumps, motor, bases and new flanged suction and discharge piping.</p>	
<p>Water Treatment Plant, City of South Bay, FL Barker, OSHA and Anderson - 860 U.S. Highway 1, West Palm Beach, FL (561) 683-3301 Assembly of two ozone generators and associated piping. Yard piping between structures, filter gallery flanged piping. Chlorine equipment and piping.</p>	
<p>Wastewater Treatment Plant Expansion, Clewiston, FL U.S. Sugar Corp, Clewiston, FL Gee and Jensen Inc. 1 Harvard Circle, West Palm Beach, FL (561) 683-3301 Replacement of bridges, gearboxes and mixers in both accelator units. Yard piping from new ground storage tanks to high service pumps. Wellpoint system installation. Equipment operating of hydraulic crane, tractor and loader.</p>	
<p>Ground Storage and Re-pump Station, City of South Bay, FL Barker, OSHA and Anderson - 860 U.S. Highway 1, West Palm Beach, FL (561) 683-3301 1,600 sq. ft. concrete pump house with two split-case hi-service electric pumps and diesel stand-by. 1,500 gallon hydro tank and foundation Crom ground storage tank. Yard piping and chlorine equipment.</p>	
<p>Wastewater Treatment Plant Expansion, City of South Bay, FL Barker, OSHA and Anderson - 860 U.S. Highway 1, West Palm Beach, FL (561) 683-3301 Assembly of both clarifier mechanisms and complete tertiary filter unit. Assembly of R.B.C. disk units and covers. Equipment operator.</p>	
<p>Water Treatment Plant – Filter Modification U.S. Sugar Corp, Clewiston, FL Gee and Jensen Inc. 1 Harvard Circle, West Palm Beach, FL (561) 683-3301 Filter media removal and replacement. Surface sweeping threaded piping modification.</p>	

Wastewater Pump Station, City of Palm Beach, FL

Hutcheon Engineers 4431 Embarcadero Dr., West Palm Beach, FL (561) 845-0666

Form setter, rebar placement, concrete placement and finishing. Assembly of flanged and mechanical joint piping. Installed Flytt pumps and bases. Installed chlorine equipment. Assembled ozone filtering units and piping. Combination excavator and Bantam truck-crane operator.

Grumman Eco-Systems

Responsibility – Millwright and 20 Ton Hydraulic Crane Operator

1976 – 1978

Job Detail

Assembly of 24 motor / gearbox / propeller mixing units of three aeration basins. Assembly and leveling of three 170' clarifier mechanisms. Assembly of pumps and piping for two sludge return stations. Installation, leveling and alignment of four diesel turbine generators and discharge silencers.

Mac Pherson's Marine Services, Inc.

Responsibility – Marine Mechanic

1969 – 1976

Job Detail

Factory trained and authorized mechanic for outboard, sterndrive and inboard gas/diesel propulsion. Shop and dockside repairs, installation and maintenance. Skilled in powerboat and sail seamanship. Past member (Flag Lieutenant) U.S. Power Squadron, Delray Beach, FL.

On-Going & Completed Project Experience & Reference List

Updated

7/11/2024 10:08

Project Name	Owner	Address	Contract Contact	Email Address	Phone #	Nature of Work	X	% Cmpl	Orig. Days	Final Days	Orig. \$	Current / Final \$	Projected/ Actual SC
City of Ft. Lauderdale FiveAsh Water Treatment Plant Filter Rehabilitation - Phase 2	City of Ft. Lauderdale	4321 NW 9th Ave, Ft. Lauderdale, FL	Scott A. Teschky	steschky@fortlauderdale.gov	954-828-6195	Replacement of existing Media and Underdrain Inspection for Filters 1-4, 6,9,14,15, 17-22.		100%	870	540	3,301,397	3,301,397	12/30/2023
Broward County 2A Effluent Pipe Replacement	Broward County	2555 W Copans Road, Pompano Beach FL 33069	Oscar Asgar	oasgar@broward.org	954-831-0983	Remove & Replace (2) existing 48" Effluent Pipes from 2A Units 1 & 2		50%	360	360	406,900	406,900	2/3/2024
Town of Lantan WTP Resin Replacement & Improvements	Town of Lantana	510 W Pine Street, Lantana, FL 33462	Jerry Darr	jdarr@lantana.org	Office: 561-540-5758	Construction of Improvements WTP rehabilitation of (3) AIX Vessels & (2) IXS System. Updates to the PLC & AIX/IXS Controls Software. Filter Valve Replacement		20%	590	590	2,404,000	2,404,000	2/9/2025
City of Sunrise - Sawgrass WTP Train A RAD - WAS Pump Replacement	City of Sunrise	10770 W Oakland Park Blvd, Sunrise, FL 33351	Guarionex De Los Santos	gdelossantos@sunrisefl.gov	Office: 954-888-6077 Cell: 954-789-8709	Construction of Train A RAS & WAS Pump Replacement		40%	365	365	1,655,600	1,655,600	5/2/2024
Miami Dade Alexander Orr WTP Bulk Sodium Hypochlorite Feed & Storage Facility	Miami Dade County	3071 SW 38th Ave Miami, FL 33233	Alejandro Echeverry	alejandro.echeverry@miamidade.gov	Office: 786-552-8444 Cell: 786-893-5425	Construction new Sodium Hypo Storage & Feed System. Replace existing Chlorine Gas & Pilot Sodium Hypo Storage & Feed System.		30%	575	575	4,362,930	4,362,930	2/18/2025
City of Homestead Racetrack Water Tower Booster Pump Station	City of Homestead	100 Civic Court Homestead, FL 33030	Hamley Pacheco, P.E.	hpacheco@cityofhomestead.com	305-224-4484	Construction of Booster Pump Station		80%	195	195	899,900	899,900	1/30/2024
Broward County WTP 2A Lime Slaker Replacement	Broward County	2555 W Copans Road, Pompano Beach FL 33069	Oscar Asgar	oasgar@broward.org	954-831-0983	Replace of one (1) existing Lime Slaker System from 2A WTP.		100%			404,600	404,600	11/30/2022
Broward County Replace Chemical Storage Tanks	Broward County	2555 W Copans Road, Pompano Beach FL 33069	Oscar Asgar	oasgar@broward.org	954-831-0983	2A WTP - FRP Sodium Hypochlorite 14,380 Gallon Bulk Storage Tank - Remove, replace and dispose. North Regional WTP - HDPE 6,550 Gallon Bulk Storage Tank - Remove, Replace and dispose. 3C WTP - Remove and properly dispose of the existing Ammonia Gas Equipment and Install new Liquid Ammonium Sulfate(LAS) equipment in the existing Ammonia Gas Room. 2A WTP - FRP Storage Tanks - Repair Four (4) Tanks and perform structural concrete and coating repairs to an existing Containment Sump Pit. MPS - 458 & MPS 460 - 500Gallon Double Wall UL - 142 Storage Tanks - Install Two (2) Storage Tanks.		100%			456,051	456,051	1/19/2023
Plantation East WTP Chemical Storage	City of Plantation	400 NW 73rd Ave Plantation, FL 33317	Brett Miller	bmiller@plantation.org	Office: 954-326-7634	Construction of five (5) chemical storage and feed facilities within the membrane building at the East WTP.		100%	525	525	3,476,000	3,476,000	12/30/2023
Town of Lantan WTP High Service Pump Improvements	Town of Lantana	510 W Pine Street, Lantana, FL 33462	Jerry Darr	jdarr@lantana.org	Office: 561-540-5758	Build new Electrical & VFD Building and Remove and Replace (3) Existing High Service Pumps.		100%	365	365	1,448,000	1,448,000	8/30/2022
Broward County - Ravenswood S/S Pipe Replacement	Broward County	5440 Ravenswood Road, Dania Beach, FL 33312	Ahmad Ali	ahali@broward.org	Office: 954-357-6373 Cell: 954-850-8510	S/S Pipe Replacement and Rerouting		100%	90	90	519,500	519,500	8/29/2023
Pembroke Pines "WTP Lime Feed System Refurbishment, SCC Valve Insertion & Mag-Flow Meter Insertion" (IFB # PSUT-20-13)	City of Pembroke Pines	601 City Center Way Pembroke Pines, FL 33025	George Wrves	gwrves@ppines.com	Office: 954-518-9040 Direct: 954-518-9045 Cell: 904-237-3533	Rehab. the existing Lime Feed System including (2) Lime Slakers, (2) Slurry Tanks & (4) Slurry Pumps; Install 30" Valves in the existing 30" Softener (SCC) Eff Lines w/ (1) 30" Line Stop; Add Access Ports & Cleanouts to the 30" SCC Effluent Line; and Insertion Electromagnetic Flowmeter in the 30" treated water line.		100%	365	365	3,078,188	3,078,188	6/30/2022

On-Going & Completed Project Experience & Reference List

Updated

7/11/2024 10:08

Project Name	Owner	Address	Contract Contact	Email Address	Phone #	Nature of Work	X	% Cmpl	Orig. Days	Final Days	Orig. \$	Current / Final \$	Projected/ Actual SC
Hialeah WTP Lime Slaker Replacement & Chemical Bldg Rehabilitation	Miami-Dade County	3071 SW 38th Ave Miami, FL 33146	Luis E. Rojas	Luis.Rojas@miamidade.gov	Tel: 786-552-4374 Cell: 786-402-1292	Remove & Replace (2) 4,000 lb/Day Lime Slaker Units, (4) New Lime Slurry Pumps, Slurry Tanks & Mixers, All New Electrical & Controls. Concrete Repairs, Structural Rehab & New Coating Systems.		100%	270	600	4,932,211	4,932,211	5/20/2023
Broward County 1A & 2A Lime Slaker Replacement	Broward County	2555 W Copans Road, Pompano Beach FL 33069	Oscar Asgar	Oasgar@broward.org	954-831-0983	Replaced existing Integrity paste-Type lime Slaker Electrical & Controls (1) at WTP 1A & (1) at WTP 2A					573,900	618,900	5/11/2022
Pembroke Pines Water Treatment Facility Improvements (PSUT-19-03)	City of Pembroke Pines	601 City Center Way Pembroke Pines, FL 33025	George Wrves	gwrves@ppines.com	Office: 954-518-9040 Direct: 954-518-9045 Cell: 904-237-3533	Install New Air Scour System on (16) Greenleaf Filter Cell, Including New Blower & Air Distribution Header throughout the WTP, Electrical & I&C. All New WTP SCADA System.		100%	270	400	2,879,686	2,879,686	8/30/2021
Broward County - 3B Facility Chlorination System	Broward County	2555 W Copans Road, Pompano Beach FL 33069	Alicia Dunne	<a href="mailto:Dunne,Alicia<ADUNNE@broward.org>">Dunne, Alicia <ADUNNE@broward.org>	954.831.0793	Installation of New Sod-Hypo Chlorite & LAS Chemical Systems & New Tank Mixing System		100%	330	330	879,400	879,400	3/4/2021
Broward County - Retail Master PS 221 Rehabilitation	Broward County	2555 W Copans Road, Pompano Beach FL 33069	Ulrich Cordon; William P. (Pat) Mitchell	UCORDON@broward.org WMITCHELL@broward.org	Ulrich: 954-831-0998 Pat: 954-831-0958 Pat: Cell 954-553-5565	Rehab. of Existing PS 221, Including: Gen-Set, Fuel Tank, Well-Wet Concrete Rehab., New Electrical & Controls, Rehab Architectural		100%	480	480	2,380,605	2,550,074	11/24/2021
Broward County - Reuse Expansion	Broward County	2555 W Copans Road, Pompano Beach FL 33069	Jeff Greenfield, Broward PM, Dylan Riedel, Prime Contractor PM.	jgreenfield@broward.org ; <a href="mailto:Dylan Riedel <DylanR@pkflorida.com>">Dylan Riedel <DylanR@pkflorida.com>	Jeff Greenfield 954-804-3397; Dylan Riedel 305-849-4303	Furnish & Install (2) 2,500 kW Gen-Sets, (64) Dyna-Sand Reuse Filters, (2) Auto-Backwash Strainers, (5) FRP Tanks, (12) Re-Use & Filter Pumps		100%	720	720	10,667,830	10,667,830	9/30/2021
Broward County Lime Slaker System Replacement WTP 1A	Broward County	2555 W Copans Road, Pompano Beach FL 33069	Oscar Asgar	oasgar@broward.org	954-831-0983	Replaced (1) Existing Integrity Paste-Type Lime Slaker, Electrical & Controls at WTP 1A.		100%	210	210	294,900	294,900	12/30/2020
Collier County - Emergency Chlorine Scrubber Replacement	Collier County	3339 Tamiami Trl E, Suite 303	Alicia Abbott	Alicia.Abbott@colliercountyfl.gov	239-877-3961	Removal & Replacement of Existing Chlorine Gas Scrubber System		100%	240	240	328,000	328,000	5/26/2020
Broward County - Distric 2A Ground Stoarge Tank	Broward County	2555 W Copans Road, Pompano Beach FL 33069	Mark Ludwigson A/E, Jeff Greenfield, Broward PM, Dylan Riedel, Prime Contractor PM.	jgreenfield@broward.org ; <a href="mailto:Dylan Riedel <DylanR@pkflorida.com>">Dylan Riedel <DylanR@pkflorida.com> ; mludwigson@carollo.com	Jeff Greenfield 954-804-3397; Dylan Riedel 305-849-4303; Mark L Cell (561) 868-6403, (954) 295-8189	Installation of 5MG Crom Tank, Including 42" & 54" UG Piping & Valves, Site Work & (2) 42" x 100' Mixing Tank Systems Inside Tank.		100%	540	540	3,632,000	3,632,000	10/31/2020
Lime Slaker #3 Replacement	City of Pembroke Pines	8300 S Palm Drive	Paul Thompson	<a href="mailto:Thompson,Paul<pthompson@ppines.com>">Thompson, Paul <pthompson@ppines.com>	954-518-9097	Replaced (1) Existing Integrity Paste-Type Lime Slaker		100%	270	270	209,728	209,728	11/30/2019
Broward County WTP 1A & 2A Treatment Unit Rehabilitations	Broward County	2555 W Copans Road, Pompano Beach FL 33069	Oscar Asgar	oasgar@broward.org	954-831-0983	Rehabilitation of Existing Lime Treatment Unit #2 at WTP 1A; Lime Treatment Unit #2 at WTP 2A and Lime Treatment Unit #1 at WTP 2A.		100%	270	270	1,833,010	1,900,010	12/30/2019
Broward County WTP 1A Treatment Unit #2 Rehabilitation	Broward County	2555 W Copans Road, Pompano Beach FL 33069	Oscar Asgar	oasgar@broward.org	954-831-0983	Rehabilitation of Existing Lime Treatment Unit #2 at WTP 1A.		100%	90	90	704,010	704,010	7/19/2019
Broward County WTP 2A Treatment Unit #1 & #2 Rehabilitation	Broward County	2555 W Copans Road, Pompano Beach FL 33069	Oscar Asgar	oasgar@broward.org	954-831-0983	Rehabilitation of Existing Lime Treatment Unit #2 at WTP 2A. Rehabilitation of Existing Lime Treatment Unit #1 at WTP 2A.		100%	270	270	1,129,000	1,196,000	12/30/2019
Peele-Dixie Check Valve R&R	City of Fort Lauderdale	Peele-Dixie WTP	DJ Tanner, Don Hering	<a href="mailto:DJ.Tanner'<dj@fc-spec.com>">DJ Tanner' <dj@fc-spec.com>	DJ - 603-548-5376, Don - 954-483-9497	Remove & Replace (1) 16" Check Valve		100%	10	14	35,000	35,000	2/14/2019
Greenleaf Filter Valve Replacement	Town of Davie	3500 NW 76th Ave, Hollywood FL 33024	Stanley Ebanks	stanley_ebanks@davie-fl.gov ; <a href="mailto:DJ.Tanner'<dj@fc-spec.com>">DJ Tanner' <dj@fc-spec.com>	Stanley - 954-822-3991	Remove & Replace (4) 10" & (4) 18" BFV's w/ Air Operator in an existing "Green Leaf" Package Filter		100%	30	30	118,000	118,000	2/26/2019
SDWWTP - CCC Gate Replacement	Miami-Dade County	8950 SW 232 Street	Don Miller, Daniel Lizarazo	don.miller@miamidade.gov , Daniel.Lizarazo@miamidade.gov	Don 717-461-0779; Daniel 305-205-0902	Remove & Replace (11) 60" Rodney Hunt Cast Iron Sluice Gates		100%	262	320	946,917	946,917	11/30/2018
SDWWTP - Effluent Wet Well #1 & #2	Miami-Dade County	8950 SW 232 Street	Don Miller, Daniel Lizarazo	don.miller@miamidade.gov , Daniel.Lizarazo@miamidade.gov	Don 717-461-0779; Daniel 305-205-0902	Replaced All Mech Piping & (2) 48" BFV Seals		100%	120	120	412,000	412,000	5/30/2018

On-Going & Completed Project Experience & Reference List

Updated

7/11/2024 10:08

Project Name	Owner	Address	Contract Contact	Email Address	Phone #	Nature of Work	X	% Cmpl	Orig. Days	Final Days	Orig. \$	Current / Final \$	Projected/ Actual SC
GT Lohmeyer WWTP Effluent Pump #1, #4 & #5 Rehab. & Check Valve Replacement	City of Fort Lauderdale	1765 SE 18th St	Justin P. Murray	JMurray@FortLauderdale.gov	954-828-4122	Removal & Replace (2) 1250 HP & (1) 1750 HP Effluent Pump Rotating Mechanisms & 36" Check Valves		100%	240	240	570,000	620,703	9/7/2018
Sodium Hypo & CO2 Injection System	City of Pembroke Pines	8300 S Palm Drive	David Stambaugh CGA, George Wrves City of Pembroke Pines	dstamaugh@cgasolutions.com , <a href="mailto:Wrvs, George.<gwrves@ppines.com>">Wrvs, George.<gwrves@ppines.com>	David S 561-681-5271, George Wrves (954) 518-9045 Office, (904) 237-3533 Cell	Installation of New CO2 System & New Sodium Hypochlorite Feed System		100%	270	330	1,828,640	1,828,640	1/30/2019
Broward County Air Stations #1 & #25	Broward County	115 S Andrews Ave	Juan Cacasus	jcacasus@broward.org	954-3576177	Sitework, Concrete & Install (2) Pre-Fabricated Air Monitoring Stations		100%	120	-----	514,900	514,900	6/30/2019
Greenleaf Filter Replacement	City of Tamarac	10101 State St	Anthony Licata	Anthony.Licata@tamarac.org	954-597-3777	Filter Media, Metal Repair Work & Recoating of Existing Steel Tank Interior		100%	120	210	529,000	662,000	1/30/2018
Hydrotreator #3 & #4 Rehab.	City of Fort Lauderdale	100 N. Andrews Ave	Omar Castellon	ocastellon@fortlauderdale.gov	954-828-5064	Replace Existing 30" Influent Piping Mag-Flow Meters, Piping & Butter-Fly Valves.		100%	270	390	399,000	544,401	2/15/2018
20" & 16" Bermad Valve Rehabilitation & Replacement	City of Port St. Lucie	10700 Glades Cut-Off	Robert Whritenhour	robert.whritenour@fc-spec.com	(407) 579-5000	Rehab (6) & Replace (1) 16" & 20" Bermad Control Valve & WWTP		100%	60	60	75,000	75,000	2/7/2017
Replacement of 90" BFV North District WWTP	Miami-Dade Water & Sewer Department	2575 NE 156 St, North Miami 33160	Robert Whritenhour	robert.whritenour@fc-spec.com	(407) 579-5000	Replaced Existing 90" BFV on Main Ocean Outfall - Install Labor & Equipment - Owner Furnished Materials		100%	360	360	100,000	100,000	7/30/2016
Relocation of 48" Plug Valve	Miami-Dade Water & Sewer Department	3800 NW 180th Street, Opa Locka 33055	Robert Whritenhour	robert.whritenour@fc-spec.com	(407) 579-5000	Service Contract for OEM		100%	120	120	60,000	60,000	5/30/2016
WTP#2 Filter Replacement	Palm Beach County	Pineherst Drive, Lake Worth	Vince Riccobono		(561) 493-6143	New 18 MGD Sand & Anthrecite Filters	X	100%	720	900	13,900,000	14,500,000	
South District WWTP Cogeneration Improvements - Design-Build	Miami-Dade Water & Sewer Department	SDWWTP - Miami FL	Humberto Codespodi		(305) 274-9272	See Attached Detail CV - Thad Buckley	X	100%	720	720	19,500,000	21,500,000	
South District WWTP HLD Upgrade to 285-mgd Filter System	Miami-Dade Water & Sewer Department	SDWWTP - Miami FL	TJ Potok		(305) 274-9272	See Attached Detail CV - Thad Buckley	X	100%	1800	1440	135,000,000	127,000,000	
South District WWTP Fat, Oil & Grease Septage Facility	Miami-Dade Water & Sewer Department	SDWWTP - Miami FL	TJ Potok		(305) 274-9272	See Attached Detail CV - Thad Buckley	X	100%	720	800	17,000,000	16,800,000	
Belle Glade Wastewater Treatment Plant Improvements	Palm Beach County	Belle Glade, FL	Jackie Michaels		(561) 493-6000	See Attached Detail CV - Thad Buckley	X	100%	540	600	1,650,000	1,699,000	
Hollywood Water Treatment Plant Electrical Power Generator System Expansion	City of Hollywood	Hollywood WTP - Hollywood Blvd - FL	Jetu Petel		(954) 921-3930	See Attached Detail CV - Thad Buckley	X	100%	540	540	1,750,000	1,710,000	
Hollywood Water Treatment Plant Membrane Replacement	City of Hollywood	Hollywood WTP - Hollywood Blvd - FL	Jetu Petel		(954) 921-3930	See Attached Detail CV - Thad Buckley	X	100%	360	300	1,700,000	1,752,000	
Wastewater Repump Stations A, B & E Rehabilitation	City of Fort Lauderdale	Various Locations	Walt Schwartz		(954) 426-6311	See Attached Detail CV - Thad Buckley	X	100%	720	720	11,000,000	11,256,000	
G.T. Lohmeyer WWTP Pumping System Improvements	City of Fort Lauderdale	Eisenhower Blvd	Walt Schwartz		(954) 426-6311	See Attached Detail CV - Thad Buckley	X	100%	720	800	8,300,000	8,670,000	
Waste Management CNG Fueling Facility, Waste Management	Waste Management	Pompanp Beach, FL				See Attached Detail CV - Thad Buckley	X	100%	270	270	1,820,000	1,820,000	
Peele-Dixie Membrane Plant, City of Fort Lauderdale, FL	City of Fort Lauderdale	State Road 7, Fort Lauderdale, FL	Janeen Wietgreffe	Jwietgreffe@hazenandsawyer.com	(954) 987-0066	See Attached Detail CV - Thad Buckley	X	100%	860	1080	26,500,000	27,300,00	
Southern Regional WWTP Oxygen System Upgrade	City of Hollywood	Hollywood WWTP - Taft Street - FL	Jetu Petel		(954) 921-3930	See Attached Detail CV - Thad Buckley	X	100%	600	680	10,300,000	10,500,000	
Fiveash Water Treatment Plant Upgrades - Phase 1	City of Fort Lauderdale	Powerline Road, Fort Lauderdale FL	George Brown	gbrown@hazenandsawyer.com	(954) 987-0066	See Attached Detail CV - Thad Buckley	X	100%	1080	1080	12,040,000	12,500,000	
Fiveash Water Treatment Plant Filter Rehabilitation	City of Fort Lauderdale	Powerline Road, Fort Lauderdale FL	George Brown	gbrown@hazenandsawyer.com	(954) 987-0066	See Attached Detail CV - Thad Buckley	X	100%	270	360	1,800,000	2,400,000	
G.T. Lohmeyer WWTP Effluent Pump Station	City of Fort Lauderdale	Eisenhower Blvd	Walt Schwartz		(954) 426-6311	See Attached Detail CV - Thad Buckley	X	100%	270	360	1,800,000	2,400,000	
Glades Road WTP 40-mgd Membrane Softening Process Addition	City of Boca Raton	Glades Road WTP	Frank Brinson Chris Helfrich	Frank.Brinson@mccaffertybrinson.com Chelfrich@myboca.us	(954) 797-7100 (561) 338-7300	See Attached Detail CV - Thad Buckley	X	100%	1260	1440	48,200,000	49,600,000	

On-Going & Completed Project Experience & Reference List

Updated

7/11/2024 10:08

Project Name	Owner	Address	Contract Contact	Email Address	Phone #	Nature of Work	X	% Cmplt	Orig. Days	Final Days	Orig. \$	Current / Final \$	Projected/ Actual SC
Glades Road Sodium Hypochlorite Generation System	City of Boca Raton	Glades Road WTP	Frank Brinson	Frank Brinson fbrinson@mccaffertybrinson.com	(954) 797-7100	See Attached Detail CV - Thad Buckley	X	100%	540	540	3,804,000	4,002,300	

X - As PM, VP or RM of P&K/MWHC See Attached Resume

SEE ATTACHED FOR ADDITION RELATED PROJECTS



Ron DeSantis, Governor

Melanie S. Griffin, Secretary



**STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION**

CONSTRUCTION INDUSTRY LICENSING BOARD

THE PLUMBING CONTRACTOR HEREIN IS CERTIFIED UNDER THE
PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

BUCKLEY, THADDEUS R

RF ENVIRONMENTAL SERVICES, INC.

4840 NE 11TH AVE

FORT LAUDERDALE FL 33334

LICENSE NUMBER: CFC1429319

EXPIRATION DATE: AUGUST 31, 2024

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CONSTRUCTION INDUSTRY LICENSING BOARD

THE GENERAL CONTRACTOR HEREIN IS CERTIFIED UNDER THE
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BUCKLEY, THADDEUS R

RF ENVIRONMENTAL SERVICES, INC.

4840 NE 11TH AVE

FORT LAUDERDALE FL 33334

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BUCKLEY, THADDEUS R

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THE POLLUTANT STORAGE SYSTEMS CONTRACTOR HEREIN IS CERTIFIED UNDER THE
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BUCKLEY, THADDEUS R

RF ENVIRONMENTAL SERVICES, INC.

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LICENSE NUMBER: PCC1256939

EXPIRATION DATE: AUGUST 31, 2024

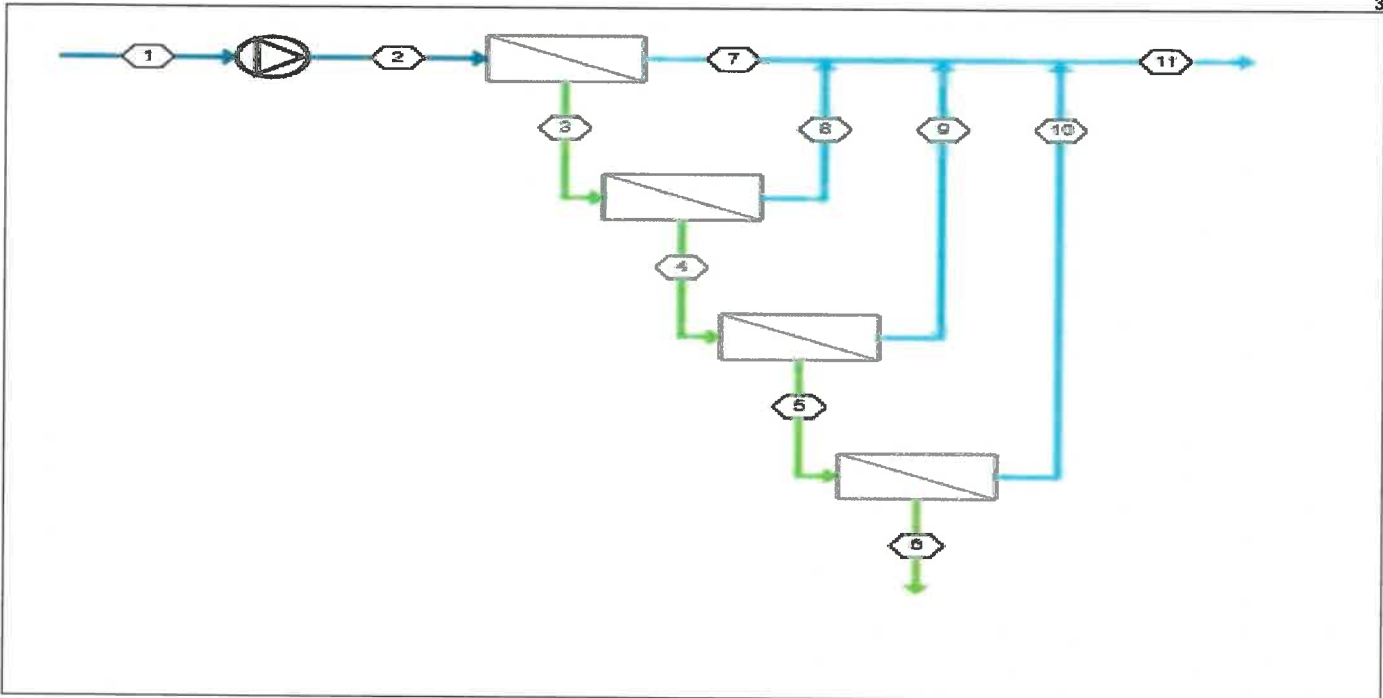
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Permeate pressure



Stream No.	Flow (gpm)	Pressure (psi)	TDS (mg/l)	pH	Econd (µS/cm) (@ 25.0 °C)
1	1597	0	553	7.20	790
2	1597	103	553	7.20	790
3	683	88.0	1233	7.53	1727
4	409	76.6	2006	7.73	2660
5	246	70.6	3160	7.91	3991
6	207	56.4	3571	7.96	4451
7	914	47.0	42.0	6.10	56.2
8	274	25.0	75.0	6.36	99.0
9	163	25.0	271	6.86	400
10	38.8	25.0	978	7.40	1444
11	1389	25.0	101	6.46	143

Product performance calculations are based on nominal element performance when operated on a feed water of acceptable quality. The results shown on the printouts produced by this program are estimates of product performance. No guarantee of product or system performance is expressed or implied unless provided in a separate warranty statement signed by an authorized Hydranautics representative. Calculations for chemical consumption are provided for convenience and are based on various assumptions concerning water quality and composition. As the actual amount of chemical needed for pH adjustment is feedwater dependent and not membrane dependent, Hydranautics does not warrant chemical consumption. If a product or system warranty is required, please contact your Hydranautics representative. Non-standard or extended warranties may result in different pricing than previously quoted.

Project name		Hollywood FL-NF	Permeate pressure		4/4
Client Name	TBA		Permeate flow/train	1389.00 gpm	
Calculated by	kirk.lai@nitro.com		Total plant product flow	9723.00 gpm	
HP pump flow	1596.55 gpm		Number of trains	7.00	
Feed pressure	103.2 psi		Raw water flow/train	1596.55 gpm	
Feed temperature	26.5 °C		Permeate recovery	87.00 %	
Feed Water pH	7.20		Membrane age	0.0 years	
Chemical dose, mg/l	None		Flux decline, per year	5.0 %	
Pumping specific energy	1.07 kWh/kgal		Fouling factor	1.00	
Pass NDP	39.7 psi		SP increase, per year	7.0 %	
Average flux	13.7 gfd		Inter-stage pipe loss	3.000 psi	
			Feed type	Brackish Well Non-Fouling	
			Pretreatment	Conventional	

Pass-Stage	Perm. Flow	Flow / Vessel	Flux	DP	Flux	Beta	Stagewise Pressure	Perm.	Membrane	Membrane	PV# x				
	gpm	gpm	gfd	psi	gfd		Boost	Conc	Type	Quantity	Elem #				
		Conc			Max	Perm.	Exhaust	psi							
1-1	913.5	49.9	21.3	14.7	15.2	18.4	1.14	47.0	0.0	0	88.0	42.0	ESNA1-LF-LD	224	32 x 7M
1-2	274.0	42.7	25.6	15.4	8.4	17.4	1.13	25.0	0.0	0	76.6	75.0	ESNA1-LF-LD	64	16 x 4M
1-3	162.9	25.6	15.4	12.2	3.0	14.0	1.17	25.0	0.0	0	70.6	270.6	ESNA1-LF2-LD	48	16 x 3M
1-4	38.8	41.0	34.6	4.7	11.3	7.3	1.05	25.0	0.0	0	56.4	978.0	ESNA1-LF2-LD	30	6 x 5M

*****Calculation of Investment and Water Cost*****

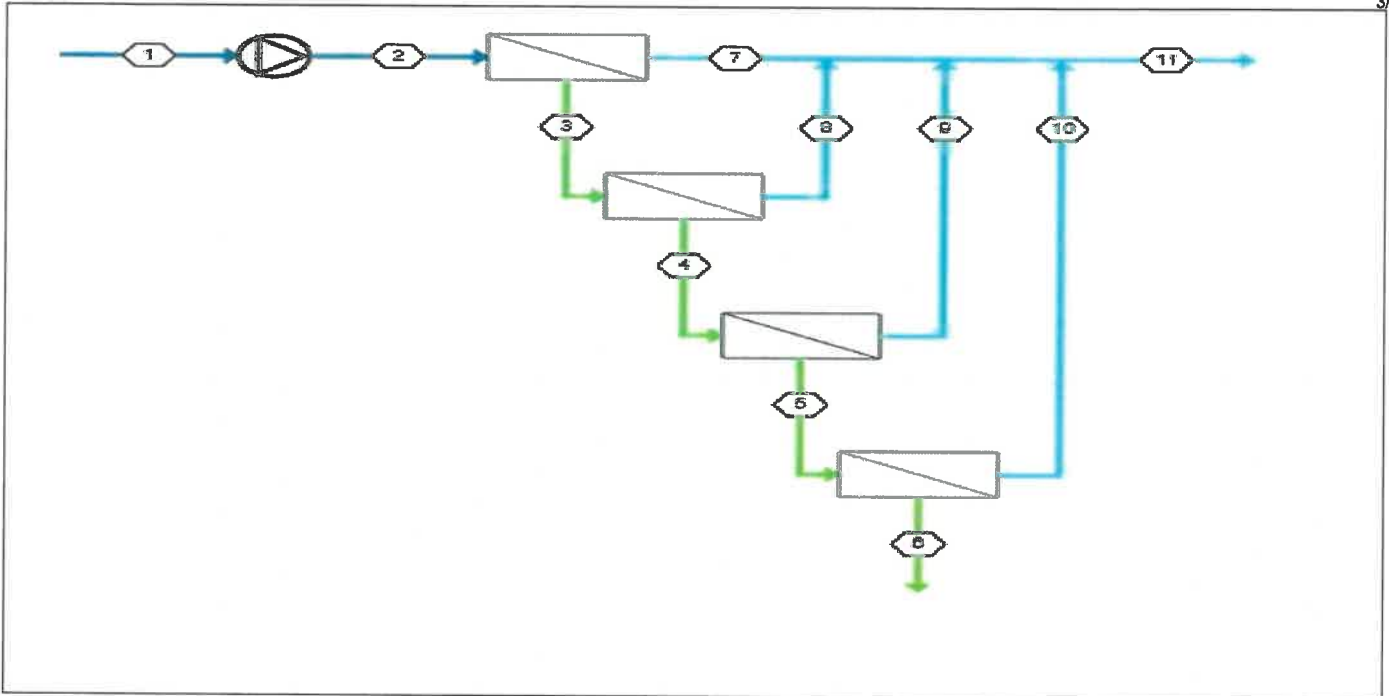
Open analysis record	1389.00 gpm
Specific investment	5,030.71 USD/gpm
Investment	6,987,658.00 USD
Plant life	15.0 years
Membrane life	5.0 years
Interest rate	4.5 %
Membrane cost	800.00 USD/element
Plant factor	90.0 %
Number of elements	366.0
Power cost	0.200 USD/kWhr
Inhibitor cost	2.20 USD/lb
Power consumption	1.07 kWhr/kgal
Inhibitor cost	3.0 mg/l
Maintenance (% of investment)	3.0 %
Acid cost	0.15 USD/lb
Acid dosing	0.00 mg/l

*****Calculation Results*****

Capital cost	0.17 USD/kgal
Power cost	0.21 USD/kgal
Chemicals cost	0.02 USD/kgal
Membrane replacement cost	0.02 USD/kgal
Maintenance (% of investment)	0.08 USD/kgal
Total water cost	0.51 USD/kgal

Product performance calculations are based on nominal element performance when operated on a feed water of acceptable quality. The results shown on the printouts produced by this program are estimates of product performance. No guarantee of product or system performance is expressed or implied unless provided in a separate warranty statement signed by an authorized Hydranautics representative. Calculations for chemical consumption are provided for convenience and are based on various assumptions concerning water quality and composition. As the actual amount of chemical needed for pH adjustment is feedwater dependent and not membrane dependent, Hydranautics does not warrant chemical consumption. If a product or system warranty is required, please contact your Hydranautics representative. Non-standard or extended warranties may result in different pricing than previously quoted.

Permeate pressure



Stream No.	Flow (gpm)	Pressure (psi)	TDS (mg/l)	pH	Econd (µS/cm) (@ 25.0 °C)
1	1597	0	553	7.20	790
2	1597	105	553	7.20	790
3	690	89.7	1224	7.53	1713
4	418	78.2	1962	7.72	2605
5	251	72.1	3086	7.90	3905
6	207	57.6	3534	7.96	4413
7	907	47.0	44.9	6.13	59.9
8	272	25.0	79.1	6.38	104
9	167	25.0	274	6.86	404
10	43.5	25.0	912	7.37	1360
11	1389	25.0	106	6.48	150

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Project name		Hollywood FL-NF		Permeate pressure				4/4
Client Name		TBA		Permeate flow/train		1389.00 gpm		
Calculated by		kirk.lai@nitto.com		Total plant product flow		9723.00 gpm		
HP pump flow		1596.55 gpm		Number of trains		7.00		
Feed pressure		105.0 psi		Raw water flow/train		1596.55 gpm		
Feed temperature		26.5 °C		Permeate recovery		87.00 %		
Feed Water pH		7.20		Membrane age		1.0 years		
Chemical dose, mg/l		None		Flux decline, per year		5.0 %		
Pumping specific energy		1.09 kWh/kgal		Fouling factor		0.95		
Pass NDP		41.4 psi		SP increase, per year		7.0 %		
Average flux		13.7 gfd		Inter-stage pipe loss		3.000 psi		
				Feed type		Brackish Well Non-Fouling		
				Pretreatment		Conventional		

Pass- Stage	Perm. Flow	Flow / Vessel		Flux	DP	Flux	Beta	Stagewise Pressure			Perm. TDS	Membrane Type	Membrane Quantity	PV# x Elem #	
		Feed	Conc					Max	Boost	Exhaust					Conc
1-1	906.9	49.9	21.6	14.6	15.3	18.1	1.14	47.0	0.0	0	89.7	44.9	ESNA1-LF-LD	224	32 x 7M
1-2	271.9	43.1	26.1	15.3	8.5	17.2	1.13	25.0	0.0	0	78.2	79.1	ESNA1-LF-LD	64	16 x 4M
1-3	166.8	26.1	15.7	12.5	3.1	14.2	1.17	25.0	0.0	0	72.1	273.9	ESNA1-LF2-LD	48	16 x 3M
1-4	43.5	41.8	34.6	5.2	11.5	7.9	1.05	25.0	0.0	0	57.6	912.4	ESNA1-LF2-LD	30	6 x 5M

*****Calculation of Investment and Water Cost*****

Open analysis record	1389.00 gpm
Specific investment	5,030.71 USD/gpm
Investment	6,987,658.00 USD
Plant life	15.0 years
Membrane life	5.0 years
Interest rate	4.5 %
Membrane cost	800.00 USD/element
Plant factor	90.0 %
Number of elements	366.0
Power cost	0.200 USD/kWhr
Inhibitor cost	2.20 USD/lb
Power consumption	1.07 kWhr/kgal
Inhibitor cost	3.0 mg/l
Maintenance (% of investment)	3.0 %
Acid cost	0.15 USD/lb
Acid dosing	0.00 mg/l

*****Calculation Results*****

Capital cost	0.17 USD/kgal
Power cost	0.21 USD/kgal
Chemicals cost	0.02 USD/kgal
Membrane replacement cost	0.02 USD/kgal
Maintenance (% of investment)	0.08 USD/kgal
Total water cost	0.51 USD/kgal

Product performance calculations are based on nominal element performance when operated on a feed water of acceptable quality. The results shown on the printouts produced by this program are estimates of product performance. No guarantee of product or system performance is expressed or implied unless provided in a separate warranty statement signed by an authorized Hydranautics representative. Calculations for chemical consumption are provided for convenience and are based on various assumptions concerning water quality and composition. As the actual amount of chemical needed for pH adjustment is feedwater dependent and not membrane dependent, Hydranautics does not warrant chemical consumption. If a product or system warranty is required, please contact your Hydranautics representative. Non-standard or extended warranties may result in different pricing than previously quoted.

Permeate pressure

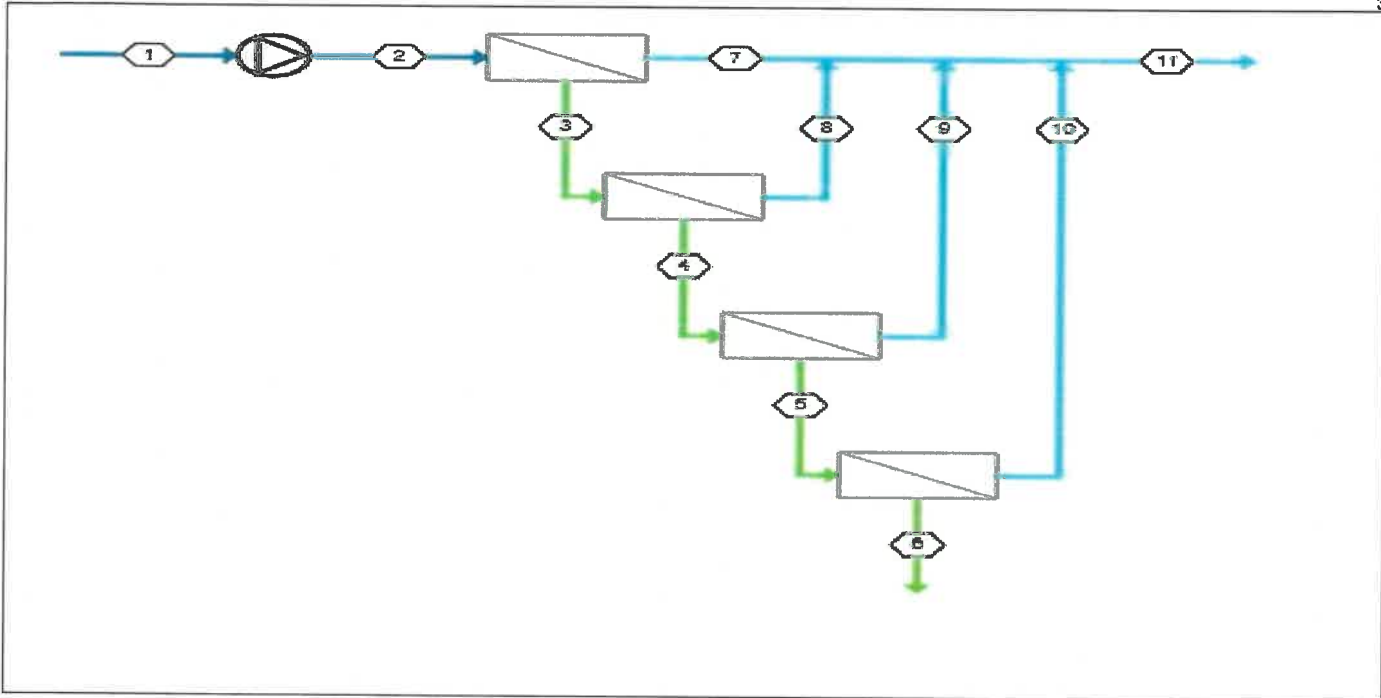
Project name	Hollywood FL-NF	Permeate flow/train	1389.00 gpm
Client Name	TBA	Total plant product flow	9723.00 gpm
Calculated by	kirk.lai@nitto.com	Number of trains	7.00
HP pump flow	1596.55 gpm	Raw water flow/train	1596.55 gpm
Feed pressure	106.9 psi	Permeate recovery	87.00 %
Feed temperature	26.5 °C	Membrane age	2.0 years
Feed Water pH	7.20	Flux decline, per year	5.0 %
Chemical dose, mg/l	None	Fouling factor	0.90
Pumping specific energy	1.11 kWh/kgal	SP increase, per year	7.0 %
Pass NDP	43.3 psi	Inter-stage pipe loss	3.000 psi
Average flux	13.7 gfd	Feed type	Brackish Well Non-Fouling
		Pretreatment	Conventional

Pass-Stage	Perm. Flow	Flow / Vessel		Flux	DP	Flux	Beta	Stagewise Pressure			Perm.	Membrane	Membrane	PV# x	
	gpm	Feed	Conc	gfd	psi	gfd		Boost	Exhaust	Conc	TDS	Type	Quantity	Elem #	
		gpm	gpm				psi	psi	psi	psi	mg/l				
1-1	900.8	49.9	21.7	14.5	15.4	17.8	1.14	47.0	0.0	0	91.5	47.7	ESNA1-LF-LD	224	32 x 7M
1-2	269.9	43.5	26.6	15.2	8.7	16.9	1.13	25.0	0.0	0	79.8	83.1	ESNA1-LF-LD	64	16 x 4M
1-3	170.3	26.6	16.0	12.8	3.2	14.4	1.18	25.0	0.0	0	73.7	277.4	ESNA1-LF2-LD	48	16 x 3M
1-4	48.0	42.6	34.6	5.8	11.7	8.4	1.05	25.0	0.0	0	59.0	861.1	ESNA1-LF2-LD	30	6 x 5M

Pass-Stage	membrane no.	Feed Pressure	Pressure Drop	Conc Osmotic pressure	NDP	Permeate Flow	Water Flux	Recovery (%)	Beta	TDS	Permeate (Stagewise cumulative)			
		psi	psi	psi	psi	gpm	gfd	(%)		mg/l	Econd (@ 25.0 °C)	Ca	Na	Cl
					psi						mg/l	mg/l	mg/l	mg/l
1-1	1	106.9	3.39	5.0	55.1	5.0	17.8	9.9	1.10	27.8	37.4	1.111	5.348	3.914
1-1	2	103.5	2.91	5.5	50.1	4.5	16.2	10.0	1.10	30.6	41.1	1.227	5.878	4.307
1-1	3	100.6	2.49	6.1	47.0	4.2	15.2	10.4	1.10	33.4	44.8	1.345	6.398	4.696
1-1	4	98.1	2.12	6.8	44.1	4.0	14.3	10.9	1.11	36.4	48.8	1.473	6.954	5.112
1-1	5	96.0	1.78	7.6	41.5	3.7	13.4	11.5	1.12	39.7	53.2	1.616	7.561	5.569
1-1	6	94.2	1.48	8.6	39.1	3.5	12.6	12.3	1.13	43.5	58.1	1.777	8.234	6.078
1-1	7	92.8	1.22	9.8	36.7	3.3	11.8	13.1	1.14	47.7	63.7	1.961	8.988	6.650
1-2	1	88.5	2.77	10.9	52.6	4.7	16.9	10.8	1.11	62.6	82.8	2.664	11.484	8.612
1-2	2	85.8	2.34	12.2	48.9	4.4	15.7	11.3	1.11	68.6	90.7	2.930	12.546	9.423
1-2	3	83.4	1.96	13.7	45.4	4.0	14.6	11.8	1.12	75.4	99.6	3.235	13.739	10.338
1-2	4	81.5	1.63	15.5	42.0	3.7	13.5	12.3	1.13	83.2	109.7	3.585	15.087	11.375
1-3	1	76.8	1.34	17.9	35.3	4.0	14.4	15.0	1.16	211.6	313.3	29.326	32.911	25.262
1-3	2	75.5	1.04	20.8	31.6	3.6	12.8	15.7	1.17	241.1	356.5	33.564	37.159	28.636
1-3	3	74.4	0.80	24.2	27.5	3.1	11.1	16.2	1.18	277.4	409.6	38.811	42.298	32.748
1-4	1	70.6	2.69	25.3	20.8	2.3	8.4	5.5	1.05	551.9	813.9	77.599	83.333	64.783
1-4	2	68.0	2.47	26.3	17.2	1.9	6.9	4.8	1.05	617.4	910.1	86.985	92.838	72.307
1-4	3	65.5	2.30	27.1	14.0	1.6	5.6	4.1	1.04	690.2	1072.7	97.441	103.324	80.632
1-4	4	63.2	2.17	27.7	11.1	1.2	4.5	3.4	1.03	770.9	1177.7	109.070	114.872	89.828
1-4	5	61.0	2.06	28.1	8.5	1.0	3.4	2.7	1.03	860.4	1292.9	122.009	127.592	99.989

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Permeate pressure



Stream No.	Flow (gpm)	Pressure (psi)	TDS (mg/l)	pH	Econd (µS/cm) (@ 25.0 °C)
1	1597	0	553	7.20	790
2	1597	107	553	7.20	790
3	696	91.5	1201	7.52	1691
4	426	79.8	1913	7.71	2550
5	255	73.7	3003	7.89	3815
6	207	59.0	3502	7.95	4378
7	901	47.0	47.7	6.16	63.7
8	270	25.0	83.1	6.40	110
9	170	25.0	277	6.87	410
10	48.0	25.0	861	7.34	1294
11	1389	25.0	111	6.50	157

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Project name	Hollywood FL-NF	Permeate pressure	4/4
Client Name	TBA	Permeate flow/train	1389.00 gpm
Calculated by	kirk.lai@nitto.com	Total plant product flow	9723.00 gpm
HP pump flow	1596.55 gpm	Number of trains	7.00
Feed pressure	106.9 psi	Raw water flow/train	1596.55 gpm
Feed temperature	26.5 °C	Permeate recovery	87.00 %
Feed Water pH	7.20	Membrane age	2.0 years
Chemical dose, mg/l	None	Flux decline, per year	5.0 %
Pumping specific energy	1.11 kWh/kgal	Fouling factor	0.90
Pass NDP	43.3 psi	SP increase, per year	7.0 %
Average flux	13.7 gfd	Inter-stage pipe loss	3,000 psi
		Feed type	Brackish Well Non-Fouling
		Pretreatment	Conventional

Pass- Stage	Perm. Flow gpm	Flow / Vessel Feed gpm	Conc gpm	Flux gfd	DP psi	Flux gfd	Beta	Max	Perm.	Stagewise Pressure Boost psi	Exhaust psi	Conc psi	Perm. TDS mg/l	Membrane Type	Membrane Quantity	PV# x Elem #
1-1	900.8	49.9	21.7	14.5	15.4	17.8	1.14	47.0	0.0	0	91.5	47.7	ESNA1-LF-LD	224	32 x 7M	
1-2	269.9	43.5	26.6	15.2	8.7	16.9	1.13	25.0	0.0	0	79.8	83.1	ESNA1-LF-LD	64	16 x 4M	
1-3	170.3	26.6	16.0	12.8	3.2	14.4	1.18	25.0	0.0	0	73.7	277.4	ESNA1-LF2-LD	48	16 x 3M	
1-4	48.0	42.6	34.6	5.8	11.7	8.4	1.05	25.0	0.0	0	59.0	861.1	ESNA1-LF2-LD	30	6 x 5M	

*****Calculation of Investment and Water Cost*****

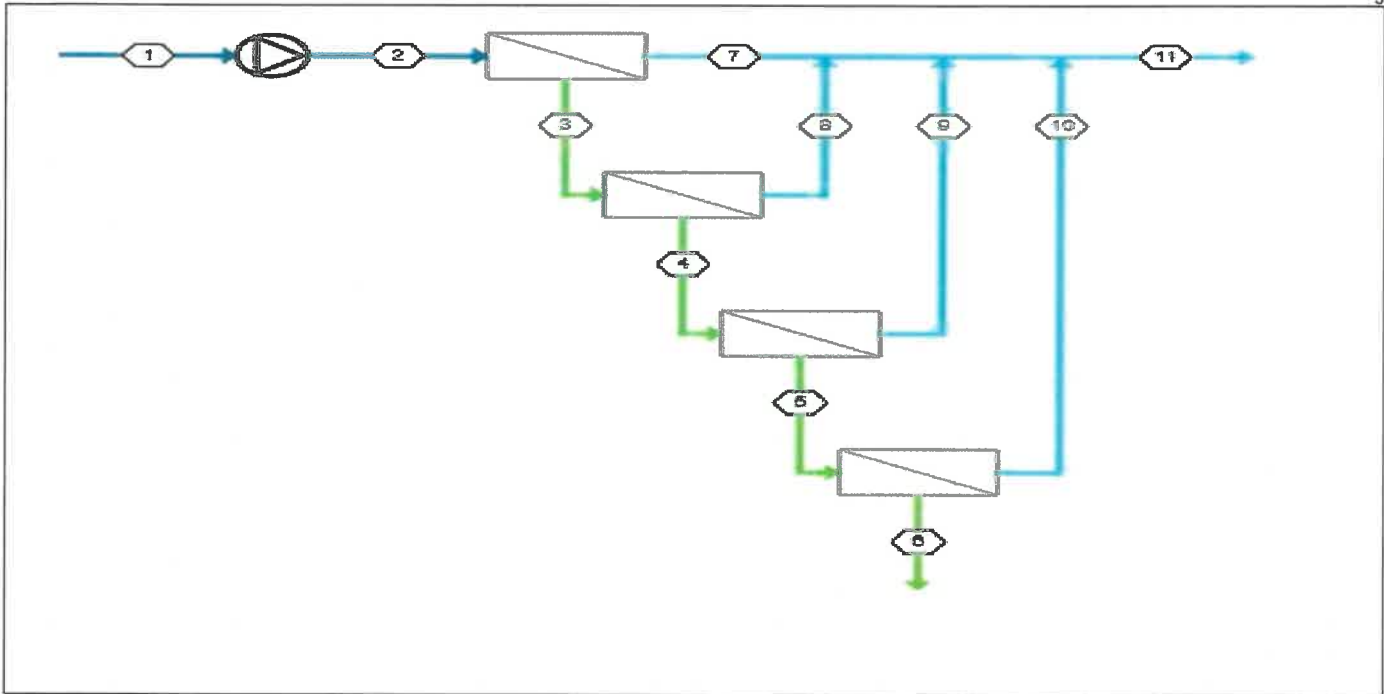
Open analysis record	1389.00 gpm
Specific investment	5,030.71 USD/gpm
Investment	6,987,658.00 USD
Plant life	15.0 years
Membrane life	5.0 years
Interest rate	4.5 %
Membrane cost	800.00 USD/element
Plant factor	90.0 %
Number of elements	366.0
Power cost	0.200 USD/kWhr
Inhibitor cost	2.20 USD/lb
Power consumption	1.07 kWhr/kgal
Inhibitor cost	3.0 mg/l
Maintenance (% of investment)	3.0 %
Acid cost	0.15 USD/lb
Acid dosing	0.00 mg/l

*****Calculation Results*****

Capital cost	0.17 USD/kgal
Power cost	0.21 USD/kgal
Chemicals cost	0.02 USD/kgal
Membrane replacement cost	0.02 USD/kgal
Maintenance (% of investment)	0.08 USD/kgal
Total water cost	0.51 USD/kgal

Product performance calculations are based on nominal element performance when operated on a feed water of acceptable quality. The results shown on the printouts produced by this program are estimates of product performance. No guarantee of product or system performance is expressed or implied unless provided in a separate warranty statement signed by an authorized Hydranautics representative. Calculations for chemical consumption are provided for convenience and are based on various assumptions concerning water quality and composition. As the actual amount of chemical needed for pH adjustment is feedwater dependent and not membrane dependent, Hydranautics does not warrant chemical consumption. If a product or system warranty is required, please contact your Hydranautics representative. Non-standard or extended warranties may result in different pricing than previously quoted.

Permeate pressure



Stream No.	Flow (gpm)	Pressure (psi)	TDS (mg/l)	pH	Econd (µS/cm) (@ 25.0 °C)
1	1597	0	553	7.20	790
2	1597	109	553	7.20	790
3	701	93.5	1193	7.52	1679
4	433	81.6	1874	7.70	2504
5	260	75.3	2937	7.88	3739
6	207	60.5	3466	7.95	4341
7	895	47.0	50.5	6.18	67.4
8	268	25.0	87.2	6.42	115
9	174	25.0	281	6.88	415
10	52.3	25.0	822	7.33	1243
11	1389	25.0	115	6.52	163

Product performance calculations are based on nominal element performance when operated on a feed water of acceptable quality. The results shown on the printouts produced by this program are estimates of product performance. No guarantee of product or system performance is expressed or implied unless provided in a separate warranty statement signed by an authorized Hydranautics representative. Calculations for chemical consumption are provided for convenience and are based on various assumptions concerning water quality and composition. As the actual amount of chemical needed for pH adjustment is feedwater dependent and not membrane dependent, Hydranautics does not warrant chemical consumption. If a product or system warranty is required, please contact your Hydranautics representative. Non-standard or extended warranties may result in different pricing than previously quoted.

Permeate pressure

4/4

Project name	Hollywood FL-NF	Permeate flow/train	1389.00 gpm
Client Name	TBA	Total plant product flow	9723.00 gpm
Calculated by	kirk.lai@nitto.com	Number of trains	7.00
HP pump flow	1596.55 gpm	Raw water flow/train	1596.55 gpm
Feed pressure	108.9 psi	Permeate recovery	87.00 %
Feed temperature	26.5 °C	Membrane age	3.0 years
Feed Water pH	7.20	Flux decline, per year	5.0 %
Chemical dose, mg/l	None	Fouling factor	0.86
Pumping specific energy	1.13 kWh/kgal	SP increase, per year	7.0 %
Pass NDP	45.2 psi	Inter-stage pipe loss	3.000 psi
Average flux	13.7 gfd	Feed type	Brackish Well Non-Fouling
		Pretreatment	Conventional

Pass-Stage	Perm. Flow	Flow / Vessel	Flux	DP	Flux	Beta	Stagewise Pressure	Perm.	Membrane	Membrane	PV# x
	gpm	gpm	gfd	psi	gfd		Boost	Conc	Type	Quantity	Elem #
1-1	895.3	49.9	21.9	14.4	15.5	1.14	47.0	93.5	ESNA1-LF-LD	224	32 x 7M
1-2	268.0	43.8	27.1	15.1	8.8	1.12	25.0	81.6	ESNA1-LF-LD	64	16 x 4M
1-3	173.5	27.1	16.2	13.0	3.3	1.18	25.0	75.3	ESNA1-LF2-LD	48	16 x 3M
1-4	52.3	43.3	34.6	6.3	11.9	8.8	25.0	60.5	ESNA1-LF2-LD	30	6 x 5M

*****Calculation of Investment and Water Cost*****

Open analysis record	1389.00 gpm
Specific investment	5,030.71 USD/gpm
Investment	6,987,658.00 USD
Plant life	15.0 years
Membrane life	5.0 years
Interest rate	4.5 %
Membrane cost	800.00 USD/element
Plant factor	90.0 %
Number of elements	366.0
Power cost	0.200 USD/kWhr
Inhibitor cost	2.20 USD/lb
Power consumption	1.07 kWhr/kgal
Inhibitor cost	3.0 mg/l
Maintenance (% of investment)	3.0 %
Acid cost	0.15 USD/lb
Acid dosing	0.00 mg/l

*****Calculation Results*****

Capital cost	0.17 USD/kgal
Power cost	0.21 USD/kgal
Chemicals cost	0.02 USD/kgal
Membrane replacement cost	0.02 USD/kgal
Maintenance (% of investment)	0.08 USD/kgal
Total water cost	0.51 USD/kgal

Product performance calculations are based on nominal element performance when operated on a feed water of acceptable quality. The results shown on the printouts produced by this program are estimates of product performance. No guarantee of product or system performance is expressed or implied unless provided in a separate warranty statement signed by an authorized Hydranautics representative. Calculations for chemical consumption are provided for convenience and are based on various assumptions concerning water quality and composition. As the actual amount of chemical needed for pH adjustment is feedwater dependent and not membrane dependent, Hydranautics does not warrant chemical consumption. If a product or system warranty is required, please contact your Hydranautics representative. Non-standard or extended warranties may result in different pricing than previously quoted.



**Hydranautics RO/NF Limited System Performance Warranty:
Prorated Replacement**

Project Name: The City of Hollywood Florida Reload

Buyer: TBD

Date (Prepared/Submitted to Customer): _____

This Limited Integrated Membrane System Performance Warranty is provided to TBD (the "Buyer") and is made by HYDRANAUTICS ("Hydranautics"), a California corporation, in connection with the Buyer's purchase of Hydranautics product(s) and the component parts thereof, as more fully described and defined in that certain sales contract ("Contract") of even date herewith. This Warranty is made and executed by Hydranautics and the Buyer as of the date set forth hereinbelow, and is effective as of the date of execution by the last to sign of the parties hereto (the "Effective Date"), subject to the terms, conditions and limitations set forth herein.

I. ACRONYMS AND DEFINITIONS

The following acronyms as used herein shall mean:

- ASTM: ATSM International
AWWA: American Water Works Association
Feedwater: The flow entering the pressure vessels that contain Covered Product
NTU: Nephelometric Turbidity Units
RO: Reverse Osmosis
NF: Nanofiltration
SDI⁽¹⁵⁾: Silt Density Index, fifteen ⁽¹⁵⁾ minute test with Millipore AAWP pads
TDS: Total Dissolved Solids as measured using the American Water Works Association ("AWWA") standard methods
TSB: Technical Service Bulletin. TSBs referenced in this Warranty may be viewed and downloaded at <http://www.membranes.com>. TSBs specifically incorporated into this Warranty by reference are attached hereto as Attachment "B."

II. ACKNOWLEDGEMENTS OF BUYER

By executing and accepting this Warranty, Buyer acknowledges to Hydranautics the following:

- A. Buyer understands and agrees that it is Buyer's sole responsibility to ensure that the RO system in which Covered Product is installed, is capable of being operated in a manner that satisfies the: (i) Feedwater Quality; (ii) Operating; and (iii) Design Conditions as set forth herein;
- B. Buyer has read and understands the terms, conditions, and limitations of this Warranty;
- C. Buyer has read and understands the Technical Service Bulletins ("TSBs") attached hereto as Attachment "B," and will comply with the procedures, recommendations and good use practices described therein. Buyer agrees to conform with all reasonable diligence to the requirements set forth in TSBs 105, 107, 108 and 118, and hereby acknowledges that in the event that Buyer's failure to reasonably comply with the requirements and recommendations set forth therein cause damage to Covered Product(s), to the extent that Covered Product(s) performance is permanently impaired or operational life is substantially shortened; then Hydranautics will be relieved of its obligations to perform the remedies set forth herein and this Warranty will be voided.
- D. Buyer understands that this Warranty is *not* effective unless an authorized representative of both Hydranautics and Buyer have affixed their respective signatures in the place provided below, signifying their mutual acceptance of the provisions, terms, conditions and limitations of this Warranty.

Buyer's Initials _____

AP FM 5102 Rev. E (DCR 20208) (4/28/21)

Page 1 of 7

III. LIMITED WARRANTY ON WORKMANSHIP AND MATERIALS

Hydranautics warrants Covered Product as free from defects in workmanship and materials for a period not to exceed **twelve (12) months** from the date of delivery to Buyer; provided however, that Covered Product are used and maintained in accordance with this Warranty. Covered Product which are not free from defects, will be repaired or replaced, at Hydranautics sole option, in accordance with the provisions of this Warranty.

IV. LIMITED PERFORMANCE WARRANTY

Hydranautics warrants Covered Product shall produce the permeate output and the permeate quality as set forth in Attachment "A," subject to the terms, conditions and limitations of this Limited Performance Warranty (the "Warranty").

V. WARRANTY TERM

This Warranty shall commence on whichever of the following events occurs first: (i) Beneficial Use (by train); or (ii) six (6) months following last delivery; or (iii) plant acceptance whichever occurs first; and shall terminate **36** months following commencement (the "Warranty Term"). Buyer shall record the date of the warranty start date as set forth in this Article V., maintain such records, and make such records available to Hydranautics in the event of a warranty claim. For purposes of this Article V., the above terms shall have the following meaning:

- A. "Beneficial Use" means – The Owner is being enriched from the installed RO membrane elements by operating the plant or individual trains in which the membrane elements are installed for the purpose producing water and where the water produced is being sold or otherwise produced or consumed for the benefit of either the Buyer or the Owner, whether within specification or not.
- B. "six (6) months following last delivery" means – six months following the last date of delivery to Buyer under the delivery terms (Incoterms) set forth in the main purchase contract, as evidenced by the shipping documents.
- C. "plant acceptance" means – the date on which the plant or system in which Covered Product are installed successfully completed acceptance testing and the Buyer received or the Owner issued a written acceptance certificate.

VI. WARRANTY TERMS AND CONDITIONS

This Warranty is expressly conditioned on Buyer's compliance with the following terms and conditions.

A. FEEDWATER QUALITY CONDITIONS

Feedwater quality shall be measured after all pre-treatment chemicals have been added and following cartridge filtration.

- 1) Turbidity must be below the value specified in Attachment A.
- 2) Feedwater SDI₍₁₅₎ must be below the value specified in Attachment A.
- 3) Covered Product whose performance is impaired due to scale formation are not covered under this Warranty.
- 4) Feedwater temperature shall not exceed 113°F (45°C).
- 5) The feedwater shall contain no oil or grease. Total hydrocarbons shall be below 100 ppb.
- 6) Feedwater shall contain no chlorine, hypochlorous, hypochlorite ion or other oxidizing agents.

Buyer's Initials _____

B. RECORDS

As a condition precedent for enforcement of Hydranautics' obligations under this warranty, Buyer agrees to maintain records in accordance with the following requirements, hereinafter collectively "Records":

- 1) Buyer shall maintain records of SDI measurements at a frequency of not less than three (3) measurements per day while Covered Product is in operation for the term of this Warranty. SDI pads should be maintained for three (3) months for reference and shall be made available to Hydranautics on request in the event a warranty claim is filed. Turbidity records shall be continuous for the term of this Warranty.
- 2) Buyer shall enter one (1) set of operating data, per operating train, per day, into the Hydranautics' RO Data Normalization Program, which may be downloaded at <http://www.membranes.com>. Data may be entered on working days only, however, data must be entered for each day of operation. Buyer agrees to enter all data and information required by ROData including, but not necessarily limited to: feed water temperature, feed water pH, feed water conductivity, permeate conductivity, concentrate flow, permeate flow, feed pressure, permeate pressure, concentrate pressure, feed water SDI and feed water turbidity.
- 3) Additionally, Buyer shall maintain a daily operations log for the system or trains, in the event the system is not operated at full capacity, in which Covered Products are installed and operating. The operations log shall record any and all plant operational events, including but not limited to: (i) system or train start-up dates and times; (ii) system or train shut-down dates and times; (iii) changes in the type, brand or concentration of chemicals used; (iv) the dates when Covered Products were cleaned as well as the type and brand of cleaning chemicals used and the procedures employed.
- 4) Additionally, Buyer shall maintain records showing the serial number of each RO Covered Product and the location and position of each Covered Product in the pressure tubes. If RO Covered Products are installed in the system by a party other than the Buyer, it is the Buyer's responsibility to obtain the loading records from the party loading Covered Products.
- 5) Upon reasonable advance notice, Buyer agrees to grant Hydranautics' employees access to the system and the operating records required herein at any time during normal business hours. Hydranautics' representative(s) shall be notified of any membrane cleanings and replacement element loading within a reasonable timeframe. An up-to-date copy of the data disc(s) produced by the Data Normalization Program, or other plant operating data, shall be provided to Hydranautics upon request. An up-to-date copy of the data disc(s) produced by Hydranautics' RO Data Normalization Program shall be sent to Hydranautics with seven (7) business days of request.

C. OTHER WARRANTY CONDITIONS

As a condition precedent for the enforcement of this Warranty, Buyer acknowledges and agrees to the following provisions:

- 1) Hydranautics shall have the right to review the system design, operating instructions, and the operation of Covered Products, including pre-treatment and cleaning procedures and chemicals used to validate Buyer's compliance with the terms and conditions of this Warranty.
- 2) This Warranty shall not be assigned or transferred by the Buyer without the prior written consent of Hydranautics, such consent to not be unreasonably withheld.

Buyer's failure to strictly adhere to the express conditions set forth in Article VI, Warranty Terms and Conditions, will void this Warranty.

Buyer's Initials _____

VII. ENFORCEMENT OF WARRANTY

- A. In the event that Covered Product fails to perform to warranted values, Buyer shall notify Hydranautics within ten (10) days of the discovery of such failure by contacting a local Hydranautics representative.
- B. Upon request, Buyer shall forward to Hydranautics the Records required by paragraph VI.B, within seven (7) business days of receipt of such request. Buyer's failure to provide Hydranautics with Records will prohibit Hydranautics from validating Buyer's warranty claim. In such event, Hydranautics shall be relieved of all of its obligations under this Warranty.
- C. If the performance issue cannot be resolved during the site visit or over the telephone, Hydranautics may request Buyer to return Covered Product(s) for performance evaluation, under TSB 116 Returned Goods Authorization, to validate Buyer's warranty claim and to confirm that the conditions of this Warranty have been satisfied. Except as may otherwise be specifically required under the terms set forth in this Warranty, Buyer shall enforce the Warranty in accordance with the procedures set forth in TSB 116, Returned Goods Authorization. Failure to comply with the procedures set forth in TSB 116 shall relieve Hydranautics of its obligations to perform under this Warranty.
- D. Buyer is solely responsible for all packing and shipment costs and risk of loss for all Covered Product shipped by Buyer to Hydranautics. Hydranautics is solely responsible for all packing and shipments costs and risk of loss for Covered Product shipped to Buyer until delivery to Buyer's facility.

VIII. BUYER'S EXCLUSIVE REMEDY

The sole obligation of Hydranautics and the sole and exclusive remedy of Buyer is limited to and is fully discharged by Hydranautics repairing or replacing Covered Product; or adding new Covered Product to achieve Warranted Performance, subject to the limitation that Hydranautics is only responsible for a replacement or repair value based on the terms provided in Attachment A, Section V.

Hydranautics reserves the right to remove membranes and replace membranes with either tighter or looser rejection membranes in order to achieve the specified permeate water quality. This would include and not be limited to the use of more ESNA1-LF2-LD membranes to achieve a higher total permeate hardness level or installing more ESNA1-LF-LD or ESPA4-LD membranes to achieve lower iron level.

IX. LIMITATIONS ON HYDRANAUTICS LIABILITY

Hydranautics' total liability under this Warranty shall not exceed the replacement value, based on the pro-rata balance of the unrealized warranty term, of one set of membrane elements per train; excluding any Covered Product or portions thereof that are replaced due to defects in material or workmanship. Covered Product, or portions thereof, that are replaced due to defects in material or workmanship will be covered as new Covered Product, although all warranty obligations will expire at the end of the Warranty Term, as set forth herein, including any remaining term of the workmanship and material warranty.

IN NO EVENT SHALL HYDRANAUTICS BE LIABLE FOR PROSPECTIVE PROFITS OR SPECIAL, INDIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES, INCLUDING BUT NOT LIMITED TO, LOST TIME, LOST PROFITS, LOST SALES, OPERATING COSTS, PLANT DOWNTIME, OR DAMAGES RESULTING FROM DELAYED SHIPMENT OR MAILING, OR THIRD PARTY CLAIMS, ARISING FROM A WARRANTY CLAIM, SALE OF A COVERED PRODUCT, OR FOR ANY DELAY OR FAILURE TO PERFORM DUE TO CAUSES BEYOND ITS REASONABLE CONTROL, INCLUDING, BUT NOT LIMITED TO, ACTS OF GOD, STRIKES, RIOTS, ACTS OF WAR, EPIDEMICS, FAILURE OF SUPPLIERS TO PERFORM, GOVERNMENTAL REGULATIONS, POWER FAILURES, EARTHQUAKES, OR OTHER DISASTERS), OR FROM ANY BREACH OF WARRANTY OR CONTRACT BY HYDRANAUTICS IN CONNECTION WITH AN WARRANTY CLAIM OR THE SALE OF A COVERED PRODUCT TO BUYER, EVEN IF HYDRANAUTICS HAS BEEN PREVIOUSLY ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. HYDRANAUTICS' TOTAL LIABILITY, WHETHER IN CONTRACT OR TORT OR OTHERWISE, ARISING OUT OF ITS SALE OF COVERED PRODUCT, OR ANY WARRANTY CLAIM

Buyer's Initials _____

AP FM 5102 Rev. E (DCR 20208) (4/28/21)

Page 4 of 7

SHALL NOT EXCEED THE REPLACEMENT VALUE OF ONE SET OF COVERED PRODUCT PER TRAIN, EXCLUDING ANY COVERED PRODUCT OR PORTIONS THEREOF THAT ARE REPLACED DUE TO DEFECTS IN MATERIAL OR WORKMANSHIP.

X. WARRANTY DISCLAIMERS

THIS WARRANTY SUPERSEDES AND REPLACES ANY PREVIOUS WARRANTY MADE OR OFFERED TO THE BUYER BY HYDRANAUTICS, EXCEPT FOR THOSE SET FORTH IN THE CONTRACT FOR SALE TO WHICH THIS LIMITED SYSTEM PERFORMANCE WARRANTY IS ATTACHED. HYDRANAUTICS DISCLAIMS ALL OTHER WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ANY GOODS PURCHASED BY YOU FROM HYDRANAUTICS. BUYER ASSUMES ALL RISKS AND LIABILITIES RESULTING FROM THE USE OF ANY COVERED PRODUCT DELIVERED HEREUNDER. EXCEPT AS SPECIFICALLY SET FORTH HEREIN, NO WARRANTY IS MADE FOR THE FITNESS OF ANY COVERED PRODUCT FOR ANY PARTICULAR PURPOSE.

XI. MISCELLANEOUS

- A. Unless otherwise provided for in this Warranty, no agent, employee, or representative of Hydranautics has any authority to bind Hydranautics to any other affirmation, representation, or warranty concerning Covered Products. Unless an affirmation, representation or warranty is specifically included in this Warranty, it shall not be enforceable by Buyer.
- B. To the extent that ANY term set forth in this Warranty is in conflict with any other agreement between the parties, the terms of this Warranty shall control, particularly regarding, but not limited to, the Limitations on Hydranautics Liability set forth in Section IX hereof.
- C. This Warranty shall be governed by and construed according to the laws of California, USA.

The **EFFECTIVE DATE OF THIS WARRANTY** shall be the latest date of execution by the last to sign of the parties hereto.

FOR HYDRANAUTICS:

Signature:

Name:

Title:

Date:

FOR BUYER:

Signature:

Name:

Date:

Buyer's Initials _____

Attachment "A" to HYDRANAUTICS RO/NF LIMITED SYSTEM PERFORMANCE WARRANTY

Project Name: The City of Hollywood Florida Reload

Buyer: TBD

Date (Prepared/Submitted to Customer): _____

I. WARRANTED PERFORMANCE

The following parameters, and *only the following parameters*, are guaranteed under this Warranty.

PARAMETER	WARRANTED VALUE
a. Permeate Output (Capacity):	14 MGD Total for the system 7 trains each at 2 MGD Capacity
b. Permeate Quality:	
TDS	200 mg/l
HCO ₃	25 – 75 mg/l
Iron	0.15 mg/l
Total Hardness	Greater than 20 mg/l as CaCO₃

II. DESIGN CONDITIONS

Warranted Performance as defined in Section I. is expressly conditioned on Covered Product being operated under the Design Conditions provided below. Buyer understands and hereby agrees that operation of Covered Product under conditions other than the Design Conditions will result in performance that is different from Warranted Performance and that such different result does not indicate a defect in Covered Product.

The Design Conditions are:

a.	Maximum design feedwater ion concentrations are as follows:						
Calcium	Ca ²⁺	94.4	mg/l	Bicarbonate Alk	HCO ₃ ⁻	322.1	mg/l
Magnesium	Mg ²⁺	5.1	mg/l	Carbonate	CO ₃ ²⁻	0.36	mg/l
Sodium	Na ⁺	45.0	mg/l	Sulfate	SO ₄ ²⁻	32.0	mg/l
Potassium	K ⁺	3.4	mg/l	Chloride	Cl ⁻	41.0	mg/l
Barium	Ba ²⁺	0.02	mg/l	Fluoride	F ⁻	0.3	mg/l
Strontium	Sr ²⁺	1.0	mg/l	Nitrate	NO ₃ ⁻	0.0	mg/l
Iron	Fe ²⁺	0.7	mg/l	Silica	SiO ₂	7.60	mg/l
Ammonium	NH ₄ ⁺	0	mg/l	Boron	B	0.0	mg/l
b.	Feedwater TDS	553.0 mg/l Total Dissolved Solids as Sum of Ions					
c.	Feedwater pH	7.20 pH Units					
d.	Feedwater TOC	0.0 mg/l					
e.	Feedwater Temperature Range	26.5 Degrees Celsius					

III. SYSTEM DESCRIPTION

Each train of the reverse osmosis system consists of:

First pass:

a.	32 Pressure Vessels, each Pressure Vessel houses 7 membrane elements – First Stage
b.	16 Pressure Vessels, each Pressure Vessel houses 7 membrane elements – Second Stage
c.	6 Pressure Vessels, each Pressure Vessel houses 7 membrane elements – Third Stage

Buyer's Initials _____

Please refer to applicable IMSDesign projection for additional details.

Total Number of trains: first pass 7; and second pass 0

Model and Total number of Covered Product Installed: 2016 ESNA1-LF-LD + 546 ESNA1-LF2-LD= 2562

Membrane Model	Total Quantity
ESNA1-LF-LD first stage	1568
ESNA1-LF-LD 2 nd stage first 4 positions	448
ESNA1-LF2-LD 2 nd stage last 3 positions	336
ESNA1-LF2-LD 3 rd stage 5 positions	210

IV. OPERATING PARAMETERS

- A. The system and single train element flux rate shall not exceed the design value at any time during RO operation.
- B. Maximum recovery shall not exceed 87 % in the first pass.
- C. Pressure drop across a pressure vessel shall never exceed 60 psig (4.1bar).
- D. Feedwater SDI₍₁₅₎ shall be maintained at less than or equal to 3.0 SDI₍₁₅₎ 95% of the time and maximum of 4.0.
- E. Feedwater Turbidity shall be maintained at less than or equal to 0.2 NTU 95% of the time and maximum of 0.3 NTU.
- F. The applied operating pressure shall at no time exceed the maximum pressure rating of the Covered Product as set forth in TSB105.
- G. The membrane element shall not, at any time, be exposed to permeate back pressure (where permeate static pressure exceeds feed static pressure) including during shut-down, greater than 0.35 bar (5 psig.)
- H. At no time shall Covered Product be subjected to pressurization/depressurization at a rate greater than zero point seven (0.7) bar (10 psig) per second.
- I. Covered Product which experience structural or mechanical damaged as a result of Buyer's failure to meet these operating conditions are not covered under this warranty.

V. LIMITATION OF WARRANTY: BUYER'S REPLACEMENT COSTS

Hydranautics' total liability under the Warranty is limited by Buyer's responsibility for the cost of a prorated percentage replacement of the Covered Product. The prorated replacement cost to Buyer will be calculated according to a monthly prorated rate as set forth above in Article V, Warranty Term. The replacement price for each element of the Covered Product shall be the original contract price adjusted by (a) +1% per year for each year of the cumulative replacement or (b) the total positive escalation of the USA Producer Price Index (PPI) **Series Id:** PCU325211325211, whichever is greater. **Industry:** Plastics material and resins mfg. **Product:** plastics material and resins mfg. prorated to the date of the replacement (the "Replacement Price").

Buyer's Initials _____

1.08 SYSTEM OPERATON AND MAINTENANCE

- A. The Owner agrees to operate the membrane softening system in accordance with the MEM's operating and maintenance instructions. The OWNER further agrees to provide a continuous supply of clean raw water to the system with water quality similar to that indicated above and the following additional operating guidelines (to be filled in by the MEM):

Maximum cleaning solution temperature: 45 / 113 degrees C / F (see TSB 107 for pH / temperature limits)

Maximum feed water SDI: < 4.0 (based on 15 minutes) and < 3.0 greater than 95% of the time

Maximum feed water: 10.0 pH

Minimum feed water: 2.0 pH

Maximum cleaning solution: 12.0 pH @ 25 C (see TSB 107 for pH / temp limits)

Minimum cleaning solution: 1.0 pH @ 25 C (see TSB 107 for pH / temp limits)

Maximum cleaning solution flow pressure drop across pressure vessel: 60 psi

Maximum flow of cleaning solution: 55 gpm/vessel

- B. The OWNER agrees to clean the membranes in strict conformance with the MEM's instructions regarding methods, cleaning agents, and frequency.
- C. The OWNER agrees to calculate the normalized system performance on a monthly basis using the MEM's standard normalization software available as of the date of Award or similar normalization software submitted by the MEM and approved by the OWNER and ENGINEER. The OWNER agrees to provide the MEM with monthly performance analysis reports using the MEM's normalization software.



Technical Service Bulletin

January 2020 TSB107.26

Foulants and Cleaning Procedures for composite polyamide RO/NF Membrane Elements

This bulletin provides general information about the usual foulants affecting the performance of Hydranautics' Composite Polyamide Reverse Osmosis (RO) membrane elements and the removal of these foulants. The information in this bulletin applies to 4-inch, 6-inch, 8-inch, 8.5-inch, and 16-inch diameter RO membrane elements.

Note: The Composite Polyamide type of RO membrane elements may not be exposed to chlorinated water under any circumstances. Any such exposure will cause irreparable damage to the membrane. Absolute care must be taken following any disinfection of piping or equipment or the preparation of cleaning or storage solutions to ensure that no trace of chlorine is present in the feedwater to the RO membrane elements. If there is any doubt about the presence of chlorine, perform chemical testing to make sure. Neutralize any chlorine residual with a sodium bisulfite solution, and ensure adequate mixing and contact time to accomplish complete dechlorination. Dosing rate is 1.8 to 3.0 ppm sodium bisulfite per 1.0 ppm of free chlorine.

Note: It is recommended that all RO membrane cleaning operations should be closely coordinated with Hydranautics during the RO membrane element warranty period. Hydranautics field service personnel are available to be on site for cleaning assistance, should the need arise. Please contact Hydranautics for current charges for this service.

Note: The use of cationic surfactants should be avoided in cleaning solutions, since irreversible fouling of the membrane elements may occur. In regards to any proprietary chemicals, Hydranautics position is that the vendor of these proprietary chemicals is responsible for guaranteeing their product is compatible with Hydranautics membranes. Thus, the chemical vendor would be solely responsible for the financial and other impacts a negative interaction may have.

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RO Membrane Fouling and Cleaning

During normal operation over a period of time, RO membrane elements are subject to fouling by suspended or sparingly soluble materials that may be present in the feedwater. Common examples of foulants are:

- Calcium carbonate scale
- Sulfate scale of calcium, barium or strontium
- Metal oxides (iron, manganese, copper, nickel, aluminum, etc.)
- Polymerized silica scale
- Inorganic colloidal deposits
- Mixed inorganic/organic colloidal deposits
- NOM organic material (Natural Organic Matter)
- Man-made organic material (e.g. antiscalant/dispersants, cationic polyelectrolytes)
- Biological (bacterial bioslime, algae, mold, or fungi)

The nature and rapidity of fouling depends on a number of factors, such as the quality of the feedwater and the system recovery rate. Typically, fouling is progressive, and if not controlled early, will impair the RO membrane element performance in a relatively short time. Cleaning should occur when the RO shows evidence of fouling, just prior to a long-term shutdown, or as a matter of scheduled routine maintenance. The elements shall be maintained in a clean or "nearly clean" condition to prevent excessive fouling by the foulants listed above. Under normal circumstances, some fouling is allowed as long as the normalized parameters listed below are not allowed to deviate more than the "Typical" values. In specific cases, such as industrial and municipal wastewaters where fouling is more extreme, it may be necessary to allow for greater deviation in normalized parameters as listed under "High Fouling". In such extreme cases, the deviation in normalized parameters should be based on the stabilized performance which may occur after a week of operation.

	Typical	High Fouling
normalized permeate flow decrease	10%	20%
normalized permeate quality	10%	20%
normalized pressure drop	15%	30%

Cleaning should be carried out as soon as is practical to maintain the elements in a clean or "nearly clean" condition. Effective cleaning is evidenced by the return of the normalized parameters to their initial, Start-up, value. In the event you do not normalize your operating data, the above values still apply if you do not have major changes in critical operating parameters.

Of special note are wastewaters which have high concentrations of soluble organic compounds. Historical studies have shown that it is common to have an initial sharp drop in normalized flow and decrease of salt passage, which are characterized by 10-20% decrease over a 2-4 week time period.¹ After this initial rapid decline, the normalized flow will decline marginally over the next 6-12 months. Research has shown that the initial drop is due to the adsorption of organics onto the membrane surface. Once the membrane surface is saturated with the mono-layer of organic, this effect no longer has significant impact on membrane performance. Aggressive cleaning can recover much of this loss, but studies show the gain is only short-lived and the system will quickly return to its previous performance. Thus, it is recommended that decisions to clean be based on the decline rate after this initial stabilization.

The operating parameters that have to stay constant are permeate flow, permeate back-pressure, recovery, temperature, and feed TDS. If these operating parameters fluctuate, then it is highly

¹ UNDERSTANDING RO MEMBRANE FOULING AT WASTEWATER TREATMENT PLANTS", Craig R Bartels and Rich Franks, AWWA/AMTA Membrane Technology Conference, Glendale, AZ, 2012.

recommended that you normalize the data to determine if fouling is occurring or if the RO is actually operating normally based on the change in a critical operating parameter. Hydranautics offers a free normalization software program called ROData, which can be downloaded from our web site at www.membranes.com.

Monitoring overall plant performance on a regular basis is an essential step in recognizing when membrane elements are becoming fouled. Performance is affected progressively and in varying degrees, depending on the nature of the foulants. Table 1 "RO Troubleshooting Matrix" provides a summary of the expected effects that common foulants have on performance.

RO cleaning frequency due to fouling will vary by site. A rough rule of thumb as to an acceptable cleaning frequency is once every 3 to 12 months. If you have to clean more than once a month, you should be able to justify further capital expenditures for improved RO pretreatment or a re-design of the RO operation. If the cleaning frequency is every one to three months, you may want to focus on improving the operation of your existing equipment but further capital expenditure may be harder to justify.

It is important to clean the membranes when they are only lightly fouled, not heavily fouled. Heavy fouling can impair the effectiveness of the cleaning chemical by impeding the penetration of the chemical deep into the foulant and in the flushing of the foulant out of the elements. If normalized membrane performance drops 30 to 50%, it may be impossible to fully restore the performance back to baseline conditions.

When inorganic or polyelectrolyte coagulants are used in the pretreatment process, there can often be incomplete reaction of the coagulant and thus insufficient formation of a filterable floc. The user should ensure that excessive amounts of coagulant are not fed to the RO system, as it can lead to fouling. Polyelectrolyte fouling can often be very difficult to remove and result in higher than expected feed pressure. Excessive amounts of inorganic coagulant can be measured by using SDI filter equipment. In the case of iron, the iron on the SDI filter pad should typically be 3 µg/pad and never above 5 µg/pad. In regards to polymer coagulants, the user should discuss the concern with their chemical supplier and have them ensure that the chemical will not adversely affect the membrane.

In addition to the use of turbidity and SDI, particle counters are also very effective to accurately measure the suitability of the feedwater for NF/RO elements. The measure of particles greater than 2 microns in size should be < 100 particles per millilitre.

One RO design feature that is commonly overlooked in reducing RO cleaning frequency is the use of RO permeate water for flushing foulants from the system. Soaking the RO elements during standby with permeate can help dissolve scale and loosen precipitates, reducing the frequency of chemical cleaning.

What you clean for can vary site by site depending on the foulant. Complicating the situation frequently is that more than one foulant can be present, which explains why cleanings frequently require a low pH and high pH cleaning regimen.

Note: The membrane elements shall not be exposed to feed water containing oil, grease, or other foreign matter which proves to chemically or physically damage the integrity of the membrane.

Table 1: RO Troubleshooting Matrix
 (Pressure Drop is defined as the Feed pressure minus the Concentrate pressure)

Possible Cause	Possible Location	Pressure Drop	Feed Pressure	Salt Passage
Metal Oxide Fouling (e.g. Fe, Mn, Cu, Ni, Zn)	1 st stage lead elements	Rapid increase	Rapid increase	Rapid increase
Colloidal Fouling (organic and/or inorganic complexes)	1 st stage lead elements	Gradual increase	Gradual increase	Slight increase
Mineral Scaling (e.g. Ca, Mg, Ba, Sr)	Last stage tail elements	Moderate Increase	Slight increase	Marked increase
Polymerized Silica	Last stage tail elements	Normal to increased	Increased	Normal to increased
Biological Fouling	Any stage, usually lead elements	Marked increase	Marked increase	Normal to increased
Organic Fouling (dissolved NOM)	All stages	Gradual increase	Increased	Decreased
Antiscalant Fouling	2 nd stage most severe	Normal to increased	Increased	Normal to increased
Oxidant damage (e.g Cl ₂ , ozone, KMnO ₄)	1 st stage most severe	Normal to decreased	Decreased	Increased
Hydrolysis damage (out of range pH)	All stages	Normal to decreased	Decreased	Increased
Abrasion damage (carbon fines, etc)	1 st stage most severe	Normal to decreased	Decreased	Increased
O-ring leaks (at interconnectors or adapters)	Random (typically at feed adapter)	Normal to decreased	Normal to decreased	Increased
Glue line leaks (due to permeate back- pressure in service or standby)	1 st stage most severe	Normal to decreased	Normal to decreased	Increased
Glue line leaks (due to closed permeate valve while cleaning or flushing)	Tail element of a stage	Increased (based on prior fouling & high delta P)	Increased (based on prior fouling & and high delta P)	Increased

Discussion on Foulants

Calcium Carbonate Scale: Calcium carbonate is a mineral scale and may be deposited from almost any feedwater if there is a failure in the antiscalant/dispersant addition system or in the acid injection pH control system that results in a high feedwater pH. An early detection of the resulting calcium carbonate scaling is absolutely essential to prevent the damage that crystals can cause on the active membrane layers. Calcium carbonate scale that has been detected early can be removed by lowering the feedwater pH to between 3.0 and 5.0 for one or two hours. Longer resident accumulations of calcium carbonate scale can be removed by a low pH cleaning with a citric acid solution.

Calcium, Barium & Strontium Sulfate Scale: Sulfate scale is a much "harder" mineral scale than calcium carbonate and is harder to remove. Sulfate scale may be deposited if there is a failure in the antiscalant/dispersant feed system or if there is an over feed of sulfuric acid in pH adjustment. Early detection of the resulting sulfate scaling is absolutely essential to prevent the damage that crystals can cause on the active membrane layers. Barium and strontium sulfate scales are particularly difficult to remove as they are insoluble in almost all cleaning solutions, so special care should be taken to prevent their formation.

Calcium Phosphate Scale: This scale is particularly common in municipal waste waters and polluted water supplies which may contain high levels of phosphate. This scale can generally be removed with acidic pH cleaners. Calcium phosphate scaling potential is currently modelled in our IMSD software. As a rule of thumb, contact Hydranautics technical department if phosphate levels in the feed are 5 ppm or higher.

Metal Oxide/Hydroxide Foulants: Typical metal oxide and metal hydroxide foulants are iron, zinc, manganese, copper, aluminum, etc. They can be the result of corrosion products from unlined pipes and tanks, or result from the oxidation of the soluble metal ion with air, chlorine, ozone, potassium permanganate, or they can be the result of a pretreatment filter system upset that utilizes iron or aluminum-based coagulant aids.

Polymerized Silica Coating: A silica gel coating resulting from the super-saturation and polymerization of soluble silica can be very difficult to remove. It should be noted that this type of silica fouling is different from silica-based colloidal foulants, which may be associated with either metal hydroxides or organic matter. Silica scale can be very difficult to remove by traditional chemical cleaning methods. Contact Hydranautics technical department if the traditional methods are unsuccessful. There does exist harsher cleaning chemicals, like ammonium bifluoride, that have been used successfully at some sites but are considered rather hazardous to handle and can damage equipment.

Colloidal Foulants: Colloids are inorganic or mixed inorganic/organic based particles that are suspended in water and will not settle out due to gravity. Colloidal matter typically contains one or more of the following major components: iron, aluminum, silica, sulfur, or organic matter.

Dissolved NOM Organic Foulants: The sources of dissolved NOM (Natural Organic Matter) foulants are typically derived from the decomposition of vegetative material into surface waters or shallow wells. The chemistry of organic foulants is very complex, with the major organic components being either humic acid or fulvic acid. Dissolved NOMs can quickly foul RO membranes by being absorbed onto the membrane surface. Once absorption has occurred, then a slower fouling process of gel or cake formation starts. It should be noted that the mechanism of fouling with dissolved NOM should not be confused with the mechanism of fouling created by NOM organic material that is bound up with colloidal particles.

Microbiological Deposits: Organic-based deposits resulting from bacterial slimes, fungi, molds, etc. can be difficult to remove, particularly if the feed path is plugged. Plugging of the feed path makes it difficult to introduce and distribute the cleaning solutions. To inhibit additional growth, it is important to clean and sanitize not only the RO system, but also the pretreatment, piping, dead-legs, etc. The membranes, once chemically cleaned, will require the use of a Hydranautics approved biocide and an extended exposure requirement to be effective. For further information on biocides, refer to Hydranautics Technical Service Bulletin TSB-110 "Biocides for Disinfection and Storage of Hydranautics Membrane Elements".

Selection and Use of Cleaning Chemicals

There are a number of factors involved in the selection of a suitable cleaning chemical (or chemicals) and proper cleaning protocol. The first time you have to perform a cleaning, it is recommended to contact the manufacturer of the equipment, the RO element manufacturer, or a RO specialty chemical and service supplier. Once the suspected foulant(s) are identified, one or more cleaning chemicals will be recommended. These cleaning chemical(s) can be generic or can be private-labeled proprietary chemicals. Typically, the generic chemicals can be of technical grades and are available from local chemical supply companies. The proprietary RO cleaning chemicals can be more expensive, but may be easier to use and you cannot rule out the advantage of the intellectual knowledge supplied by these companies. Some independent RO service companies can determine the proper chemicals and cleaning protocol for your situation by testing at their facility a fouled element pulled from your system.

It is not unusual to use a number of different cleaning chemicals in a specific sequence to achieve the optimum cleaning. Typically, a high pH cleaning is used first to remove foulants like oil or biological matter, followed by a low pH cleaning to remove foulants like mineral scale or metal oxides/hydroxides fouling. There are times that order of high and low pH cleaning solutions is reversed or one solution only is required to clean the membranes. Some cleaning solutions have detergents added to aid in the removal of heavy biological and organic debris, while others have a chelating agent like EDTA added to aid in the removal of colloidal material, organic and biological material, and sulfate scale. An important thing to remember is that the improper selection of a cleaning chemical, or the sequence of chemical introduction, can make the foulant worse.

Hydranautics recommends that the membrane system operator thoroughly investigate the signs of fouling before they select a cleaning chemical and a cleaning protocol. Some forms of fouling (iron deposits and scaling commonly associated with well waters) may require only a simple low pH cleaning. However, for most complex fouling phenomena, Hydranautics recommends the following sequence:

1. Flushing with permeate with addition of non oxidizing biocide (DBNPA or similar type) at the end of the flushing
2. High pH CIP – Temperature versus pH as per recommendations in this TSB
3. Flushing with permeate until pH on the brine side is below pH 8.5
4. Low pH CIP
5. Acid flushing with permeate and non oxidizing biocide (DBNPA or similar type)

General Precautions in Cleaning Chemical Selection and Usage

- If you are using a proprietary chemical, make sure the chemical has been qualified for use with your Hydranautics membrane by the chemical supplier. The chemical supplier's instructions should not be in conflict with Hydranautics recommended cleaning parameters and limits listed in this Technical Service Bulletin.
- If you are using generic chemicals, make sure the chemical has been qualified for use with your Hydranautics membrane in this Technical Service Bulletin.
- Use the least harshest cleaning regimen to get the job done. This includes the cleaning parameters of pH, temperature, and contact time. This will optimize the useful life of the membrane.
- Clean at the recommended target temperatures to optimize cleaning efficiency and membrane life.
- Use the minimal amount of chemical contact time to optimize membrane life.

- Be prudent in the adjustment of pH at the low and high pH range to extend the useful life of the membrane. A “gentle” pH range is 4 to 10, while the harshest is 2 to 12.
- Oil and biologically -fouled membranes should not use a low pH clean-up first as the oil and biological matter will congeal.
- Cleaning and flushing flows should usually be in the same direction as the normal feed flow to avoid potential telescoping and element damage. In certain cases, where heavy feed end fouling has occurred, reverse flow cleaning may be more effective in removing the foulant. In these cases, please see TSB-125 “Reverse Direction Cleaning of RO Membrane Elements” and follow all recommended guidelines to prevent element damage.
- When cleaning a multi-stage RO, the most effective cleaning is one stage at a time so cleaning flow velocities can be optimized and foulants from upstream stages don’t have to pass through downstream stages.
- Flushing out detergents with higher pH permeate can reduce foaming problems.
- Verify that proper disposal requirements for the cleaning solution are followed.
- If your system has been fouled biologically, you may want to consider the extra step of introducing a sanitizing biocide chemical before and after a successful cleaning. Biocides can be introduced before and immediately after cleaning, periodically (e.g. once a week), or continuously during service. You must be sure that the biocide is compatible with the membrane, does not create any health risks, is effective in controlling biological activity, and is not cost prohibitive.
- For safety reasons, make sure all hoses and piping can handle the temperatures, pressures and pH’s encountered during a cleaning.
- For safety reasons, always add chemicals slowly to an agitated batch of make-up water.
- For safety reason, always wear safety glasses and protective gear when working with chemicals.
- For safety reasons, don’t mix acids with caustics. Thoroughly rinse the 1st cleaning solution from the RO system before introducing the next solution.

Selecting a Cleaning Solution

Table 2 lists the recommended generic chemical solutions for cleaning an RO membrane element based on the foulant to be removed. See section below on Description of Cleaning Solutions and Table 4 for cleaning solution formulations.

Important: It is recommended that the SDS of the cleaning chemicals be procured from the chemical supplier and that all safety precautions be utilized in the handling and storage of all chemicals.

Foulant	Gentle Cleaning Solution	Harsher Cleaning Solution
Calcium carbonate scale	1	4
Calcium, barium or strontium sulfate scale	2	4
Metal oxides/hydroxides (Fe, Mn, Zn, Cu, Al)	1	5
Inorganic colloidal foulants	1	4
Mixed Inorganic/organic colloidal foulants	2	6
Polymerized silica coating	None	7
Biological matter	2 or 3	6
NOM organic matter (naturally occurring)	2 or 3	6

Table 3 “Hydranautics Recipes for Cleaning Solutions” offers instructions on the volumes of bulk chemical to be added to 100 U.S. gallons (379 liters) of make-up water. Prepare the solutions by proportioning the amount of chemicals to the amount of make-up water to be used. Make-up water quality should be of RO permeate or deionized (DI) quality, and be free of chlorine and hardness (See Table 4 below). Before forwarding the cleaning solution to the membranes, it is important to thoroughly mix it, adjust the pH according to the target pH, and stabilize the temperature at the target temperature. Unless otherwise instructed, the cleaning design parameters are based on a chemical recirculation flow period of one hour and an optional chemical soak period of one hour.

Table 5 “Hydranautics Maximum pH and Temperature Limits for Cleaning” highlights the maximum pH and temperature limits for specific membranes, after which irreparable membrane damage can occur. A suggested minimum temperature limit is 70 °F (21 °C), but cleaning effectiveness and the solubility of the cleaning chemical is significantly improved at higher temperatures.

Description of Cleaning Solutions

Note: The notation (w) denotes that the diluted chemical solution strength is based on the actual weight of the 100% pure chemical or active ingredient.

Solution 1: This is a low pH cleaning solution of 2.0% (w) citric acid ($C_6H_8O_7$). It is useful in removing inorganic scale (e.g. calcium carbonate, calcium sulfate, barium sulfate, strontium sulfate) and metal oxides/hydroxides (e.g. iron, manganese, nickel, copper, zinc), and inorganic-based colloidal material. Note: Citric acid is available as a powder.

Solution 2: This is a high pH cleaning solution (target pH of 10.0) of 2.0% (w) of STPP (sodium tripolyphosphate) ($Na_5P_3O_{10}$) and 0.8% (w) of Na-EDTA (sodium salt of ethylenediaminetetraacetic acid). It is specifically recommended for removing calcium sulfate scale and light to moderate levels of organic foulants of natural origin. STPP functions as an inorganic-based chelating agent and detergent. Na-EDTA is an organic-based chelating cleaning agent that aids in the sequestering and removal of divalent and trivalent cations and metal ions. STPP and Na-EDTA are available as powders.

Solution 3: This is a high pH cleaning solution (target pH of 10.0) of 2.0% (w) of STPP (sodium tripolyphosphate) ($Na_5P_3O_{10}$) and 0.025% (w) Na-DDBS ($C_{12}H_{25}SO_3Na$) (sodium salt of dodecylbenzene sulfonate). It is specifically recommended for removing heavier levels of organic foulants of natural origin. STPP functions as an inorganic-based chelating agent and detergent. Na-DDBS functions as an anionic detergent.

Solution 4: This is a low pH cleaning solution (target pH of 2.5) of 0.5% (w) of HCL (hydrochloric acid). It is useful in removing inorganic scale (e.g. calcium carbonate, calcium sulfate, barium sulfate, strontium sulfate) and metal oxides/hydroxides (e.g. iron, manganese, nickel, copper, zinc) and inorganic-based colloidal material. This cleaning solution is considered to be harsher than Solution 1. HCL acid, a strong mineral acid, is also known as muriatic acid. HCL acid is available in a number of concentrations: (18 ° Baume = 27.9%), (20 ° Baume = 31.4%), (22 ° Baume = 36.0%).

Solution 5: This is a lower pH cleaning solution (natural pH is between pH 4 and 6. No pH adjustment is required) 1.0% (w) of $Na_2S_2O_4$ (sodium hydrosulfite). It is useful in the removal of metal oxides and hydroxides (especially iron fouling), and to a lesser extent calcium sulfate, barium sulfate and strontium sulfate. Sodium hydrosulfite is strong reducing agent and is also known as sodium dithionite. The solution will have a very strong odor so proper ventilation is required. Sodium hydrosulfite is available as a powder.

Solution 6: This is a high pH cleaning solution (target pH of 11.5) of 0.1% (w) of NaOH (sodium hydroxide) and 0.03% (w) of SDS (sodium dodecylsulfate). It is useful in the removal of organic foulants of

natural origin, colloidal foulants of mixed organic/inorganic origin, and biological material (fungi, mold, slimes and biofilm). SDS is a detergent that is an anionic surfactant that will cause some foaming. This is considered to be a harsh cleaning regimen. **Note: Do not exceed maximum pH and temp limits for specific elements. See Table 5.**

Solution 7: This is a high pH cleaning solution (target pH of 11.5) of 0.1% (w) of NaOH (sodium hydroxide). It is useful in the removal of polymerized silica. This is considered to be a harsh cleaning regimen. **Note: Do not exceed maximum pH and temp limits for specific elements. See Table 5.**

Important: It is recommended that the SDS of the cleaning chemicals be procured from the chemical supplier and that all safety precautions be utilized in the handling and storage of all chemicals.

Table 3: Hydranautics Recipes for Cleaning Solutions

The quantities listed below are to be added to 100 U.S.gallons (379 liters) of dilution water. Dilution water should meet the water quality standards in Table 4.

Cleaning Solution	Bulk Ingredients	Quantity	Target ¹ pH Adjustment	Target ¹ Temp.
1	Citric acid (as 100% powder)	17.0 pounds (7.7 kg)	No pH adjustment is Required.	104 °F (40 °C)
2	STPP (sodium tripolyphosphate) (as 100% powder) Na-EDTA (Versene 220 or equal) (as 100% powder)	17.0 pounds (7.7 kg) 7.0 pounds (3.18 kg)	Adjust to pH 10.0 with sulfuric or hydrochloric acid.	104 °F (40 °C)
3	STPP (sodium tripolyphosphate) (as 100% powder) Na-DDBS Na-dodecylbenzene sulfonate	17 pounds (7.7 kg) 0.21 pounds (0.1 kg)	Adjust down to pH 10.0 with sulfuric or hydrochloric acid.	104 °F (40 °C)
4	HCl acid (hydrochloric acid (as 22° Baume or 36% HCL)	0.47 gallons (1.78 liters)	Slowly adjust pH down to 2.5 with HCL acid. Adjust pH up with sodium hydroxide.	95 °F (35 °C)
5	Sodium hydrosulfite (as 100% powder)	8.5 pounds (3.86 kg)	No pH adjustment is required.	95 °F (35 °C)
6	NaOH (sodium hydroxide) (as 100% powder) (or as 50% liquid) SDS (sodium dodecylsulfate)	0.83 pounds (0.38 kg) 0.13 gallons (0.49 liters) 0.25 pounds (0.11 kg)	Slowly adjust pH up to 11.5 with sodium hydroxide. Adjust pH down to 11.5 by adding HCL acid.	86 °F (30 °C)
7	NaOH (sodium hydroxide) (as 100% powder) (or as 50% liquid)	0.83 pounds (0.38 kg) 0.13 gallons (0.49 liters)	Slowly adjust pH up to 11.5 with sodium hydroxide. Adjust pH down to 11.5 by adding HCL acid.	86 °F (30 °C)

¹ - Note: These pH and temperature targets are recommendations only. For maximum pH and temperature limits for specific elements. See Table 5.

Table 4. Recommendations for Make-up Water Quality for Cleaning and Flushing.

Parameter	Units
Chlorine Free	0 ppm
pH	6.5.-7.5
Hardness	
RO permeate, DI, or Soft water	< 30 ppm as CaCO ₃
Calcium (Ca)	< 5 ppm
Iron (Fe)	< 0.05 ppm
Manganese (Mn)	< 0.02 ppm
Aluminium (Al)	< 0.05 ppm
Silica (SiO ₂)	
Reactive silica	< 10 ppm
Colloidal silica	< 0.1 ppm
Particle Size	< 5 microns
Turbidity	< 0.5 NTU
Silt Density (SDI ₁₅)	< 1
Total Organic Carbon (TOC)	< 1 ppm
Fats, Oils and Grease	0 ppm

Table 5a: Hydranautics pH and Temperature Limits for Cleaning Standard Membranes

Membrane Family	Continuous Operation		Maximum Cleaning Temp			
	< 45 °C	≤ 35 °C	50 °C	≤ 45 °C	≤ 35 °C	≤ 25 °C
NANO-SW	3 to 8.5	3 to 9	Contact Hydranautics Technical Department	Contact Hyd Tech Dept	1 to 10.5	1 to 11.5
ESNA	3 to 9.5	2 to 10	Contact Hydranautics Technical Department	2 to 10.5	1 to 11	1 to 12
ESPA	3 to 10	2 to 10.6	Contact Hydranautics Technical Department	2 to 10.5	1 to 11	1 to 12
ESPAB	3 to 10.5	2 to 11	Contact Hydranautics Technical Department	2 to 11	1 to 11.5	1 to 12.5
LFC	3 to 9.5	2 to 10	Contact Hydranautics Technical Department	2 to 10.5	1 to 11	1 to 12
CPA	3 to 10.5	2 to 11	Contact Hydranautics Technical Department	2 to 11.5	1 to 12	1 to 13
SWC	3 to 10.5	2 to 11	Contact Hydranautics Technical Department	2 to 11	1 to 12	1 to 13

Note: The above cleaning parameters denote the maximum temperature limits for a corresponding range of pH. Cleaning operations performed at the extremes may result in a more effective cleaning, but can shorten the useful life of the membrane due to hydrolysis. To optimize the useful life of a membrane, it is recommended to use the least harshest cleaning solutions and minimize the contact time whenever possible. The pH of the feed stream or cleaning solution should be closely monitored and controlled. The pH meters used to measure and control pH should be regularly calibrated to ensure accuracy. It is typical to re-circulate cleaning chemicals through the RO for 1 hour. At the pH limits shown above, cleaning exposure at temperatures less than 40 °C is limited to 60 minutes, at temperatures greater than 40 °C exposure is limited to 30 minutes. Extended soaking is possible, but at less aggressive pH levels.

Table 5b Hydranautics pH and Temperature Limits for Cleaning PRO Series Membranes

Membrane Family	Continuous Operation		Maximum Cleaning Temp		
	< 45 °C	≤ 35 °C	50 °C	≤ 45 °C	≤ 35 °C
PRO-XS	3 to 8.5	3 to 9	Contact Hydranautics Technical Department	Contact Hyd Tech Dept	1 to 10.5
PRO-XT1	3 to 9.5	2 to 10	Contact Hydranautics Technical Department	2 to 10.5	1 to 11
PRO-XT2	3 to 10.5	2 to 11	Contact Hydranautics Technical Department	2 to 11	1 to 12
PRO-LF	3 to 10.5	2 to 11	Contact Hydranautics Technical Department	2 to 11	1 to 12
PRO-XP	3 to 10.5	2 to 11	Contact Hydranautics Technical Department	2 to 11	1 to 12

Note: The above cleaning parameters denote the maximum temperature limits for a corresponding range of pH. Cleaning operations performed at the extremes may result in a more effective cleaning, but can shorten the useful life of the membrane due to hydrolysis. To optimize the useful life of a membrane, it is recommended to use the least harsh cleaning solutions and minimize the contact time whenever possible. The pH of the feed stream or cleaning solution should be closely monitored and controlled. The pH meters used to measure and control pH should be regularly calibrated to ensure accuracy. It is typical to re-circulate cleaning chemicals through the RO for 1 hour. At the pH limits shown above, cleaning exposure at temperatures less than 40 °C is limited to 60 minutes, at temperatures greater than 40 °C exposure is limited to 30 minutes. Extended soaking is possible, but at less aggressive pH levels.

**Table 6a: Cleaning Flow Rates per RO Pressure Tube
(Non LD Elements = 26 mil spacer)**
(Pressures are not to exceed 60 psi (4 bar) at inlet to tubes.)

Element Diameter	GPM	LPM
4-inches – Non LD Elements	9 to 12	34 to 45
6-inches – Non LD Elements	18 to 24	68 to 91
8-inches – Non LD Elements	36 to 48	136 to 182
8.5-inches – Non LD Elements	40 to 52	151 to 197
16-inches – Non LD Elements	144 to 192	545 to 727

**Table 6b: Cleaning Flow Rates per RO Pressure Tube
(LD Elements = 34 mil spacer)**
(Pressures are not to exceed 60 psi (4 bar) at inlet to tubes.)

Element Diameter	GPM	LPM
4-inches – LD Elements	10 to 13	38 to 49
8-inches – LD Elements	40 to 53	151 to 201
8.5-inches – LD Elements	45 to 59	170 to 223

Note: In cases where the pressure drop in the membrane elements is excessively high, the cleaning flow rates should be limited to 1/3 of the normal cleaning flow rate initially. This will help prevent the element from telescoping and the feed spacer from migrating. As the foulant is removed, the cleaning flow can slowly be brought up to normal cleaning flow rates. When flushing system before and after cleaning flow rates should be half of values listed in Table 6.

Table 7: Cleaning Solution Volume Requirement per RO Element

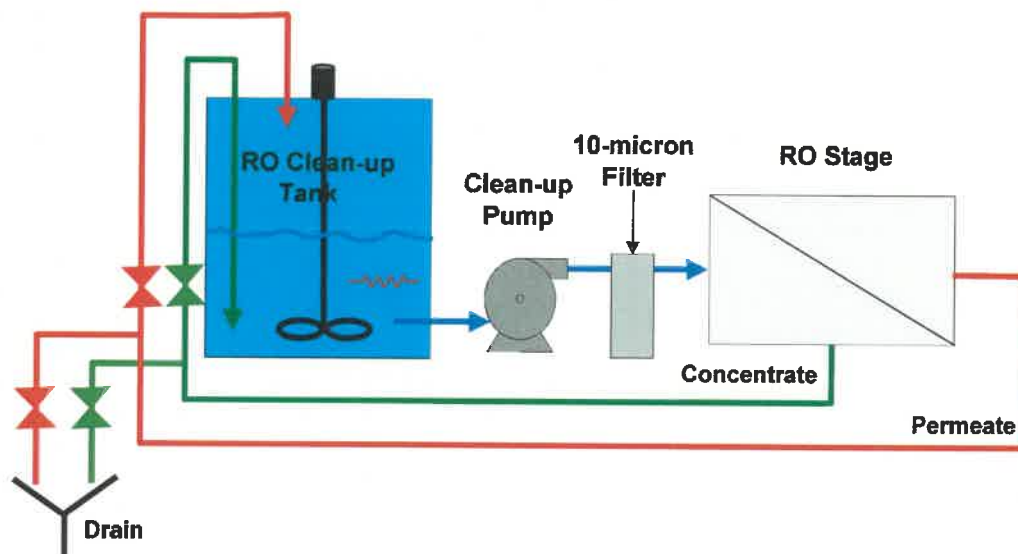
Element Size (inches)	Volume of Cleaning Solution* (These volumes do not include initial 20% of volume dumped to drain and volumes required for piping, filters, etc)	
	(US Gallons)	(Liters)
4 x 40	2.5	9.5
6 x 40	5	19
8 x 40	9	34
8.5 x 40	10	38
16 x 40	36	136

(*) These are the minimum values recommended for sizing of the cleaning tank. Actual volume used during cleaning can be higher as more than one cleaning tank volume may be required in case of heavy fouling.

RO Cleaning Skid

The successful cleaning of an RO on-site requires a well designed RO cleaning skid. Normally this skid is not hard piped to the RO skid and uses temporary hosing for connections. It is recommended to clean a multi-stage RO one stage at a time to optimize cross-flow cleaning velocity. The source water for chemical solution make-up and rinsing should be clean RO permeate or DI water and be free of hardness, transition metals (e.g. iron), and chlorine (See Table 4 above). Components must be corrosion proof. Major cleaning system components are:

RO Cleanup Skid



- **RO Cleaning Tank:** This tank needs to be sized properly to accommodate the displacement of water in the hose, piping, and RO elements. The **Table 7** above denotes the amount of chemical solution that needs to be made for a single RO element. The tank should be designed to allow 100 % drainage, easy access for chemical introduction and mixing, a recirculation line from the RO Cleaning Pump, proper venting, overflow, and a return line located near the bottom to minimize foam formation when using a surfactant.
- **RO Cleaning Pump:** This pump needs to be sized to develop the proper cross-flow velocity to scrub the membrane clean. The maximum recommended pressure is 60 psi (4 bar) at the inlet to the pressure vessels to minimize the production of permeate during cleaning and reduce the convective redeposition of foulant back on to the membrane surface. Table 6 above denotes the flow rate ranges for each pressure tube. The high pressure pump should not be used for cleaning.
- **RO Cleaning Cartridge Filter:** Normally 5 to 10-micron and is designed to remove foulants that have been displaced from the cleaning process.
- **RO Tank Heater or Cooler:** The maximum design temperature for cleaning is 113° F (45° C). It should be noted that heat is generated and imparted by the RO Cleaning Pump during recirculation. A less expensive option to consider for heating the cleaning solution is adding a return line from the discharge of the Clean-Up Pump back to the Cleaning Tank, which is plumbed to the bottom of the tank to reduce foaming and air introduction, but this can take a long time.

- RO Tank Mixer: This is recommended to get optimal mixing of chemical, though some designers rely solely on the slow introduction of chemical while maintaining a recirculation through the RO Cleaning Pump back to the tank.
- Instrumentation: Cleaning system instrumentation should be included to monitor flow, temperature, pressure, and tank level.
- Sample Points: Sample valves should be located to allow pH and TDS measurements off the RO Cleaning Pump discharge and the concentrate side recirculation return line. Permeate can be measured at the RO skid sample valves.
- Permeate Return Line: A small amount of the cleaning solution can permeate through the membranes and so a permeate-side return line back to the RO Cleaning Tank is required. The permeate return line should not be combined with the concentrate return line. If the permeate return line is combined with the concentrate line, there is the possibility that the permeate side of the membrane and the permeate lines may be exposed to contaminated cleaning solution. The permeate return line should terminate at a point above the cleaning solution tank level to avoid exposing the permeate side of the membranes or the permeate lines to the contaminated cleaning solution.
- Concentrate Return Line: The concentrate return line should terminate near the bottom of the cleaning tank to avoid foam formation in the cleaning tank caused by the introduction of air.

Important: The permeate line and any permeate valves must always be open to atmospheric pressure during the cleaning and flushing steps or damage to RO elements can occur. If the permeate line is closed, the permeate pressure can build up and become higher than the feed-side pressure of the tail elements. This can result in excessive permeate back-pressure which can damage the membrane glue lines in the tail elements. At no time should the elements be exposed to permeate back pressure (where permeate static pressure exceeds feed static pressure) greater than 0.35 bar (5 psig.)

RO Membrane Element Cleaning and Flushing Procedures

The RO membrane elements can be cleaned in place in the pressure tubes by recirculating the cleaning solution across the high-pressure side of the membrane at low pressure and relatively high flow. A cleaning unit is needed to do this. RO cleaning procedures may vary dependent on the situation. The time required to clean a stage can take from 4 to 8 hours. It is recommended to take data for RO performance normalization just before and immediately after the cleaning to evaluate the efficiency of cleaning. It may also be beneficial to start the RO rack after first cleaning step (alkaline or acid) and collect data for normalization to evaluate efficiency of each cleaning step separately.

A general procedure for cleaning the RO membrane elements is as follows:

NOTE: The permeate valves should ALWAYS remain open when cleaning or flushing the elements. If the permeate valve is closed, the pressure on the permeate line will equalize to the feed pressure. This is likely greater than the concentrate pressure, which will result in the permeate pressure being greater than on the feed side of the tail element. This may result in membrane delamination and performance failure.

1. Perform a low pressure flush at 60 psi (4 bar) or less of the pressure tubes by pumping clean water from the cleaning tank (or equivalent source) through the pressure tubes to drain for several minutes to displace any feed/brine solution from RO membranes. Flush water should be clean water of RO permeate or DI quality and be free of hardness, transition metals, and

chlorine. Flushing flow rates should normally be half of the cleaning flow rates listed in Table 6.

2. Mix a fresh batch of the selected cleaning solution in the cleaning tank. The dilution water should be clean water of RO permeate or DI quality and be free of hardness, transition metals, and chlorine. The temperature and pH should be adjusted to their target levels. Check and record also the conductivity, turbidity and Iron concentration of freshly prepared cleaning solution.
3. Circulate the cleaning solution through the pressure tubes for the desired period of time. At the start of circulation, send the displaced water to drain so you don't dilute the cleaning chemical and then divert up to 20% of the most highly fouled cleaning solution to drain before returning the cleaning solution back to the RO Cleaning Tank. For the first 5 minutes, slowly throttle the flow rate to 1/3 of the maximum design flow rate. This is to minimize the potential plugging of the feed path with a large amount of dislodged foulant. For the second 5 minutes, increase the flow rate to 2/3 of the maximum design flow rate, and then increase the flow rate to the maximum design flow rate. If required, readjust the pH back to the target when it changes more than 0.5 pH units. Temperature of cleaning solution should be controlled and kept at maximum allowed value during the whole cleaning cycle for best cleaning efficiency. After each circulation step, check the conductivity, turbidity and Iron content of cleaning solution. If these will increase significantly compared to the initial startup values, the cleaning solution shall be drained and new solution prepared to continue with cleaning to improve cleaning efficiency.

Note: Do not exceed maximum pH and temperature limits for specific elements. See Table 5.

4. A soak and recirculation sequence is sometimes used during cleaning. The soak time can be from 0.5 to 8 hours depending on the manufacturer's and/or chemical supplier's recommendations. Typically, the cleaning consists of 30 minutes circulation followed by a 30 minutes soaking cycle, followed by another 30 minutes of circulation. Caution should be used to maintain the proper temperature and pH during the whole cleaning cycle. Soaking time does increase the chemical exposure time of the membrane.

Note: Do not exceed maximum pH and temperature limits for specific elements. See Table 5.

5. Upon completion of the chemical cleaning steps, a low pressure Cleaning Rinse with clean water (RO permeate or DI quality and free of hardness, transition metals, and chlorine) is required to remove all traces of chemical from the Cleaning Skid and the RO Skid. Drain and flush the cleaning tank; then completely refill the Cleaning Tank with clean water for the Cleaning Rinse. Rinse the pressure tubes by pumping all of the rinse water from the Cleaning Tank through the pressure tubes to drain. A second cleaning can be started at this point, if required. Cleaning rinse flows should be half of those used for cleaning as listed in Table 6.

6. Once the RO system is fully rinsed of cleaning chemical with clean water from the Cleaning Tank, a Final Low Pressure Clean-up Flush can be performed using pretreated feed water. The permeate line should remain open to drain. Feed pressure should be less than 60 psi (4 bar). This final flush continues until the flush water flows clean and is free of any foam or residues of cleaning agents. This usually takes 15 to 60 minutes. The operator can sample the flush water going to the drain for detergent removal and lack of foaming by using a clear flask and shaking it. A conductivity meter can be used to test for removal of cleaning chemicals, such that the flush water to drain is within 10-20% of the feed water conductivity. A pH meter can also be used to compare the flush water to drain to the feed pH.
7. Once all the stages of a train are cleaned, and the chemicals flushed out, the RO can be restarted and placed into a Service Rinse. The RO permeate should be diverted to drain until it meets the quality requirements of the process (e.g. conductivity, pH, etc.). It is not unusual for it to take from a few hours to a few days for the RO permeate quality to stabilize, especially after high pH cleanings.

Alternative Cleaning Procedures

Other methods of recovering membrane performance are available and may be considered. Hydranautics does not guarantee the effectiveness of these alternative procedures nor does Hydranautics accept responsibility for any adverse effect such procedures may have on membrane performance. However, Hydranautics is aware of instances where these procedures have proven to be very effective.

1. Electro Magnetic Fields (EMF). Claims have been made that the introduction of a continuous electromagnetic field (EMF) around the RO membranes during operation will reduce the tendency for the membranes to foul and will particularly reduce their tendency toward scaling. (Reference : Ng, H. Y. and Winters, H., *A Novel 16-Inch RO System for Water Reuse and Desalination*. Israel Desalination Society Annual Conference, 19-20 December, 2006.)
2. Direct Osmosis at High Salinities (DO-HS) is a process of daily backwashing of BWRO during normal operation of desalination plant in which about 7% NaCl pulse is intentionally introduced for 6-12 seconds into the suction stream of high pressure pump without stopping the pump. As the high salinity plug proceeds through the RO system, the reverse osmosis flow is momentarily changed to a direct osmosis flow and permeate is sucked back through to the feed side of the membrane. This process, if conducted regularly, may lift foulants, dehydrate bacteria, and sweep out debris by increased flow velocity from the membrane surface to the brine outlet. (Reference: USA Patent 7658852, Pat. Singapore, Australia, Israel WEB: www.membrane-recovery.com.)
3. Proprietary Cleaning Chemicals. There exist several RO cleaning chemical suppliers with a number of proprietary formulations designed to address specific types of fouling. These formulations are typically based on generic chemical formulations that have been enhanced or modified through the suppliers' own research and development. (see web sites for specific chemical companies)



TSB107.26 Page 19

4. Air Scouring. It is known that two-phase (air bubbles and water) can increase shear forces and improve the removal of foulants from a membrane surface. This has been used more in the cleaning of individual elements.
5. Reverse Direction Cleaning. When the fouling is located primarily at the feed end of the RO system, it is sometimes more effective to do reverse direction cleaning. There are certain precautions that must be taken to ensure that damage to the membrane elements does not occur. Please see TSB-125 "Reverse Direction Cleaning of RO Membrane Elements" for the guidelines on this.
6. NaCl light salinity cleaning. As compared to the DO-HS above, NaCl light salinity is usually dosed at 1% weight of total cleaning volume. Dissolve the NaCl into the CIP tank and it can be used in 2 different ways. First, as an NaCl solution by itself to use as a pre-cleaner prior to standard High / Low pH solutions or, Second, as a supplement to High / Low pH solutions. NaCl increases osmotic pressures of solution to suppress the production of permeate while cleaning.

Hydranautics Corporate office

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Web: www.membranes.com Email: hy-info@nitto.com

FORM 1

SUBMITTAL CHECKLIST FORM

The items below are required components of your solicitation response in order for your bid/proposal/submittal to be consider responsive and responsible. Please complete and submit this submittal checklist form as the cover page of your submittal with all of the items below in the order listed.

Please indicated Yes or No in the “Submitted (Yes/No)” column below to indicated which required components were provided with your submittal.

Submitted (Yes/No)	Required Bid Components
	This Submittal Checklist Form completed and included as the cover page of your submittal.
	A Table of Contents that clearly identifies each section and page number of your submittal.
	Information and/or documentation that addresses and/or meets the requirements outlined in Section III – Scope of Work/Services, including any procedural or technical enhancements/innovations which do not materially deviate from the objectives or required content of the Scope of Work/Services.
	<p>Forms (Completed)</p> <ul style="list-style-type: none"> Form 1 Submittal Checklist Form* Form 2 Acknowledgement and Signature Page Form 3 Bid Form* Form 4 Vendor Reference Form* Form 5 Hold Harmless and Indemnity Clause Form 6 Non-Collusion Affidavit Form 7 Sworn Statement...Public Entity Crimes Form 8 Certifications Regarding Debarment... Form 9 Drug-Free Workplace Program Form 10 Solicitation, Giving, and Acceptance... Form 11 W-9 (Request for Taxpayer Identification) Form 12 Trench Safety Form Form 13 Bid Guaranty Form Form 14 List of Subcontractors
	Certificate(s) of insurance that meet the requirements of Section 2.17
	Proof of State of Florida Sunbiz Registration

This checklist is only a guide, please read the entire solicitation to ensure that your submission includes all required information and documentation.

FORM 2

ACKNOWLEDGMENT AND SIGNATURE PAGE

This form must be completed and submitted by the date and the time of bid opening.

Legal Company Name (include d/b/a if applicable): _____

If Corporation - Date Incorporated/Organized: _____ Federal Tax Identification Number: _____

State Incorporated/Organized: _____

Company Operating Address: _____

City: _____ State: _____ Zip Code: _____

Remittance Address (if different from ordering address):

City: _____ State: _____ Zip Code: _____

Company Contact Person: _____ Email Address: _____

Phone Number (include area code): _____ Fax Number (include area code): _____

Company's Internet Web Address: _____

IT IS HEREBY CERTIFIED AND AFFIRMED THAT THE BIDDER/PROPOSER CERTIFIES ACCEPTANCE OF THE TERMS, CONDITIONS, SPECIFICATIONS, ATTACHMENTS AND ANY ADDENDA. THE BIDDER/PROPOSER SHALL ACCEPT ANY AWARDS MADE AS A RESULT OF THIS SOLICITATION. BIDDER/PROPOSER FURTHER AGREES THAT PRICES QUOTED WILL REMAIN FIXED FOR THE PERIOD OF TIME STATED IN THE SOLICITATION.

Bidder/Proposer's Authorized Representative's Signature: _____ Date: _____

Type or Print Name: _____

THE EXECUTION OF THIS FORM CONSTITUTES THE UNEQUIVOCAL OFFER OF BIDDER/PROPOSER TO BE BOUND BY THE TERMS OF ITS PROPOSAL. FAILURE TO SIGN THIS SOLICITATION WHERE INDICATED BY AN AUTHORIZED REPRESENTATIVE SHALL RENDER THE BID/PROPOSAL NON-RESPONSIVE. THE CITY MAY, HOWEVER, IN ITS SOLE DISCRETION, ACCEPT ANY BID/PROPOSAL THAT INCLUDES AN EXECUTED DOCUMENT WHICH UNEQUIVOCALLY BINDS THE BIDDER/PROPOSER TO THE TERMS OF ITS OFFER.

SUBMISSION

How to submit bids/proposals: Vendor's solicitation response may be submitted electronically through BidSync, the City's designated electronic bidding system, or by mail or hand delivery to the address noted above. It is the Vendor's sole responsibility to assure its response is submitted and received by the date and time specified in the solicitation. Any timeframe references are in Eastern Standard Time. The official time for electronic submittals is BidSync's servers, as synchronized with the atomic clock. All parties without reservation will accept the official time.

Important Notice:

The Procurement Services Division shall distribute all official changes, modifications, responses to questions or notices relating to the requirements of this document. Any other information of any kind from any other source shall not be considered official, and bidders relying on other information do so at their own risk.

The responsibility for submitting a bid/proposal on or before the time and date is solely and strictly the responsibility of the bidder/proposer, the City will in no way be responsible for delays caused by technical difficulty or caused by any other occurrence. No part of a bid/proposal can be submitted via FAX or via direct Email to the City. No variation in price or conditions shall be permitted based upon a claim of ignorance.

**FORM 3
BID FORM**

The City is seeking bids/proposals from qualified vendors for the items listed below in accordance with the terms, conditions, and specifications contained in this solicitation. Estimated quantities listed are for information and tabulation purposes only. No warranty or guarantee of quantities needed is given or implied. It is understood that the Contractor will furnish the City's needs as they arise.

Item No.	Position Classifications	Quantity	Unit	Unit Price	Percentage Markup
1	Furnish replacement membrane pressure vessels, including all associated accessories, connections, and adapters necessary for installation on the existing NF units.	378	Ea.		
2	Furnish replacement membrane elements, including all associated accessories, connections, and adapters necessary for installation in the new pressure vessels, including 21 spare elements.	2,583	Ea.		
3	Complete installation, start-up, and testing of replacement pressure vessels and membrane elements in each NF unit.	7	Ea.		
4	Provide all other CONTRACTOR and MEM services not included in other bid items.	1	L.S.		
5	Contingency	1	L.S.		
6	Indemnification	1	L.S.	\$10.00	\$10.00
7	Mobilization	1	L.S.		
8	Demobilization	1	L.S.		
9	Testing/Permitting	1	L.S.		
GRAND TOTAL BID PRICE					\$
GRAND TOTAL BID PRICE (in words):					

Company Name

Authorized Signature

Print Name

Title

Date

VENDOR REFERENCE FORM

City of Hollywood Solicitation #: _____
 Reference for: _____

Organization/Firm Name providing reference: _____
 Organization/Firm Contact Name: _____ Title: _____
 Email: _____ Phone: _____
 Name of Referenced Project: _____ Contract No: _____
 Date Services were provided: _____ Project Amount: _____
 Referenced Vendor's role in Project: Prime Vendor Subcontractor/ Subconsultant
 Would you use the Vendor again? Yes No. Please specify in additional comments

Description of services provided by Vendor (provide additional sheet if necessary):

Please rate your experience with the Vendor	Need Improvement	Satisfactory	Excellent	Not Applicable
Vendor's Quality of Service				
d. Responsive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Accuracy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vendor's Organization:				
d. Staff expertise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Professionalism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Staff turnover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Timeliness/Cost Control of:				
c. Project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Additional Comments (provide additional sheet if necessary):

****THIS SECTION FOR CITY USE ONLY****						
Verified via:	Email:	<input type="checkbox"/>	Verbal:	<input type="checkbox"/>	Mail:	<input type="checkbox"/>
Verified by:	Name:				Title:	
	Department:				Date:	

VENDOR REFERENCE FORM

City of Hollywood Solicitation #: _____
 Reference for: _____

Organization/Firm Name providing reference: _____
 Organization/Firm Contact Name: _____ Title: _____
 Email: _____ Phone: _____
 Name of Referenced Project: _____ Contract No: _____
 Date Services were provided: _____ Project Amount: _____
 Referenced Vendor's role in Project: Prime Vendor Subcontractor/ Subconsultant
 Would you use the Vendor again? Yes No. Please specify in additional comments

Description of services provided by Vendor (provide additional sheet if necessary):

Please rate your experience with the Vendor	Need Improvement	Satisfactory	Excellent	Not Applicable
Vendor's Quality of Service				
g. Responsive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Accuracy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vendor's Organization:				
g. Staff expertise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Professionalism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Staff turnover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Timeliness/Cost Control of:				
e. Project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Additional Comments (provide additional sheet if necessary):

****THIS SECTION FOR CITY USE ONLY****						
Verified via:	Email:	<input type="checkbox"/>	Verbal:	<input type="checkbox"/>	Mail:	<input type="checkbox"/>
Verified by:	Name:				Title:	
	Department:				Date:	

FORM 5

HOLD HARMLESS AND INDEMNITY CLAUSE

_____ ,

(Company Name and Authorized Signature, Print Name)

the contractor, shall indemnify, defend and hold harmless the City of Hollywood, its elected and appointed officials, employees and agents for any and all suits, actions, legal or administrative proceedings, claims, damage, liabilities, interest, attorney's fees, costs of any kind whether arising prior to the start of activities or following the completion or acceptance and in any manner directly or indirectly caused, occasioned or contributed to in whole or in part by reason of any act, error or omission, fault or negligence whether active or passive by the contractor, or anyone acting under its direction, control, or on its behalf in connection with or incident to its performance of the contract.

Signature

Printed Name

Name of Company

Title

FORM 6

NON-COLLUSION AFFIDAVIT

STATE OF: _____

COUNTY OF: _____, being first duly sworn, deposes and says that:

- (1) He/she is _____ of _____, the Proposer that has submitted the attached Proposal.
- (2) He/she has been fully informed regarding the preparation and contents of the attached Proposal and of all pertinent circumstances regarding such Proposal;
- (3) Such Proposal is genuine and is not a collusion or sham Proposal;
- (4) Neither the said Proposer nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Proposer, firm or person to submit a collusive or sham Proposal in connection with the contractor for which the attached Proposal has been submitted or to refrain from bidding in connection with such contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Proposer, firm or person to fix the price or prices, profit or cost element of the Proposal price or the Proposal price of any other Proposer, or to secure an advantage against the City of Hollywood or any person interested in the proposed Contract; and
- (5) The price or prices quoted in the attached Proposal are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Proposer or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

Signature

Printed Name

Name of Company

Title

FORM 7

SWORN STATEMENT PURSUANT TO SECTION 287.133 (3) (a) FLORIDA STATUTES ON PUBLIC ENTITY CRIMES

THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS

1. This form statement is submitted to the City of Hollywood by _____ for _____
(Print individual's name and title) (Print name of entity submitting sworn statement) whose business address is _____ and if applicable its Federal Employer Identification Number (FEIN) is _____. If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement.

2. I understand that "public entity crime," as defined in paragraph 287.133(1)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or with the United States, including, but not limited to, any bid, proposal, reply, or contract for goods or services, any lease for real property, or any contract for the construction or repair of a public building or public work, involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misinterpretation.
3. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in an federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.
4. I understand that "Affiliate," as defined in paragraph 287.133(1)(a), Florida Statutes, means:
 1. A predecessor or successor of a person convicted of a public entity crime, or
 2. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.
5. I understand that "person," as defined in Paragraph 287.133(1)(e), Florida Statutes, means any natural person or any entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which bids or applies to bid on contracts let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

6. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. (Please indicate which statement applies.)

_____ Neither the entity submitting sworn statement, nor any of its officers, director, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, nor any affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime, but the Final Order entered by the Hearing Officer in a subsequent proceeding before a Hearing Officer of the State of the State of Florida,

Division of Administrative Hearings, determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. (attach a copy of the Final Order).

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 (ONE) ABOVE IS FOR THAT PUBLIC ENTITY ONLY AND THAT THIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THAT PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017 FLORIDA STATUTES FOR A CATEGORY TWO OF ANY CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.

(Signature)

Sworn to and subscribed before me this _____ day of _____, 20_____.

Personally known _____

Or produced identification _____ Notary Public-State of _____

_____ my commission expires _____

(Type of identification)

(Printed, typed or stamped commissioned name of notary public)

FORM 8

CERTIFICATIONS REGARDING DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITY MATTERS

The applicant certifies that it and its principals:

- (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, sentenced to a denial of Federal benefits by a State or Federal court, or voluntarily excluded from covered transactions by any Federal department or agency;
- (b) Have not within a three-year period preceding this application been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction, violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- (c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (b) of this certification; and
- (d) Have not within a three-year period preceding this application had one or more public transactions (Federal, State, or local) terminated for cause or default.

Applicant Name and Address:

Application Number and/or Project Name:

Applicant IRS/Vendor Number: _____

Signature

Printed Name

Name of Company

Title

FORM 9

DRUG-FREE WORKPLACE PROGRAM

IDENTICAL TIE PROPOSALS - Preference shall be given to businesses with drug-free workplace programs. Whenever two or more bids which are equal with respect to price, quality, and service are received by the State or by any political subdivision for the procurement of commodities or contractual services, 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. Established procedures for processing tie proposals will be followed if none of the tied vendors have a drug-free workplace program. In order to have a drug-free workplace program, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).
4. In the statement specified in subsection (1), notify the employee that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.
5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program (if such is available in the employee's community) by, any employee who is so convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of these requirements.

As the person authorized to sign the statement, I certify that this firm complies fully with the above requirements.

Signature

Printed Name

Name of Company

Title

FORM 10

SOLICITATION, GIVING, AND ACCEPTANCE OF GIFTS POLICY

Florida Statute 112.313 prohibits the solicitation or acceptance of Gifts. "No Public officer, employee of an agency, local government attorney, or candidate for nomination or election shall solicit or accept anything of value to the recipient, including a gift, loan, reward, promise of future employment, favor, or service, based upon any understanding that the vote, official action, or judgment of the public officer, employee, local government attorney, or candidate would be influenced thereby." The term "public officer" includes "any person elected or appointed to hold office in any agency, including any person serving on an advisory body."

The City of Hollywood/Hollywood CRA policy prohibits all public officers, elected or appointed, all employees, and their families from accepting any gifts of any value, either directly or indirectly, from any contractor, vendor, consultant, or business with whom the City/CRA does business.

The State of Florida definition of "gifts" includes the following:

- Real property or its use,
- Tangible or intangible personal property, or its use,
- A preferential rate or terms on a debt, loan, goods, or services,
- Forgiveness of indebtedness,
- Transportation, lodging, or parking,
- Food or beverage,
- Membership dues,
- Entrance fees, admission fees, or tickets to events, performances, or facilities,
- Plants, flowers or floral arrangements
- Services provided by persons pursuant to a professional license or certificate.
- Other personal services for which a fee is normally charged by the person providing the services.
- Any other similar service or thing having an attributable value not already provided for in this section.

Any contractor, vendor, consultant, or business found to have given a gift to a public officer or employee, or his/her family, will be subject to dismissal or revocation of contract.

As the person authorized to sign the statement, I certify that this firm will comply fully with this policy.

Signature

Printed Name

Name of Company

Title

Request for Taxpayer Identification Number and Certification

**Give Form to the
requester. Do not
send to the IRS.**

▶ Go to www.irs.gov/FormW9 for instructions and the latest information.

Print or type. See Specific Instructions on page 3.	<p>1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.</p> <hr/> <p>2 Business name/disregarded entity name, if different from above</p> <hr/> <p>3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only one of the following seven boxes.</p> <p> <input type="checkbox"/> Individual/sole proprietor or single-member LLC <input type="checkbox"/> C Corporation <input type="checkbox"/> S Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Trust/estate <input type="checkbox"/> Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____ Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is not disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner. <input type="checkbox"/> Other (see instructions) ▶ _____ </p>	<p>4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):</p> <p>Exempt payee code (if any) _____</p> <p>Exemption from FATCA reporting code (if any) _____</p> <p><small>(Applies to accounts maintained outside the U.S.)</small></p>
	<p>5 Address (number, street, and apt. or suite no.) See instructions.</p> <hr/> <p>6 City, state, and ZIP code</p> <hr/> <p>7 List account number(s) here (optional)</p>	<p>Requester's name and address (optional)</p> <hr/>

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Social security number									

or

Employer Identification number									

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here	Signature of U.S. person ▶	Date ▶
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General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to www.irs.gov/FormW9.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)

- Form 1099-DIV (dividends, including those from stocks or mutual funds)
 - Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
 - Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
 - Form 1099-S (proceeds from real estate transactions)
 - Form 1099-K (merchant card and third party network transactions)
 - Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
 - Form 1099-C (canceled debt)
 - Form 1099-A (acquisition or abandonment of secured property)
- Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.
- If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, later.*

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and
4. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting*, later, for further information.

Note: If you are a U.S. person and a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien;
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States;
- An estate (other than a foreign estate); or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax under section 1446 on any foreign partners' share of effectively connected taxable income from such business. Further, in certain cases where a Form W-9 has not been received, the rules under section 1446 require a partnership to presume that a partner is a foreign person, and pay the section 1446 withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid section 1446 withholding on your share of partnership income.

In the cases below, the following person must give Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States.

- In the case of a disregarded entity with a U.S. owner, the U.S. owner of the disregarded entity and not the entity;
- In the case of a grantor trust with a U.S. grantor or other U.S. owner, generally, the U.S. grantor or other U.S. owner of the grantor trust and not the trust; and
- In the case of a U.S. trust (other than a grantor trust), the U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

Foreign person. If you are a foreign person or the U.S. branch of a foreign bank that has elected to be treated as a U.S. person, do not use Form W-9. Instead, use the appropriate Form W-8 or Form 8233 (see Pub. 515, *Withholding of Tax on Nonresident Aliens and Foreign Entities*).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items.

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.
2. The treaty article addressing the income.
3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.
4. The type and amount of income that qualifies for the exemption from tax.
5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity, give the requester the appropriate completed Form W-8 or Form 8233.

Backup Withholding

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 24% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, payments made in settlement of payment card and third party network transactions, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester,
2. You do not certify your TIN when required (see the instructions for Part II for details),
3. The IRS tells the requester that you furnished an incorrect TIN,
4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or
5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See *Exempt payee code*, later, and the separate Instructions for the Requester of Form W-9 for more information.

Also see *Special rules for partnerships*, earlier.

What is FATCA Reporting?

The Foreign Account Tax Compliance Act (FATCA) requires a participating foreign financial institution to report all United States account holders that are specified United States persons. Certain payees are exempt from FATCA reporting. See *Exemption from FATCA reporting code*, later, and the Instructions for the Requester of Form W-9 for more information.

Updating Your Information

You must provide updated information to any person to whom you claimed to be an exempt payee if you are no longer an exempt payee and anticipate receiving reportable payments in the future from this person. For example, you may need to provide updated information if you are a C corporation that elects to be an S corporation, or if you no longer are tax exempt. In addition, you must furnish a new Form W-9 if the name or TIN changes for the account; for example, if the grantor of a grantor trust dies.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of \$50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a \$500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Line 1

You must enter one of the following on this line; **do not** leave this line blank. The name should match the name on your tax return.

If this Form W-9 is for a joint account (other than an account maintained by a foreign financial institution (FFI)), list first, and then circle, the name of the person or entity whose number you entered in Part I of Form W-9. If you are providing Form W-9 to an FFI to document a joint account, each holder of the account that is a U.S. person must provide a Form W-9.

a. **Individual.** Generally, enter the name shown on your tax return. If you have changed your last name without informing the Social Security Administration (SSA) of the name change, enter your first name, the last name as shown on your social security card, and your new last name.

Note: ITIN applicant: Enter your individual name as it was entered on your Form W-7 application, line 1a. This should also be the same as the name you entered on the Form 1040/1040A/1040EZ you filed with your application.

b. **Sole proprietor or single-member LLC.** Enter your individual name as shown on your 1040/1040A/1040EZ on line 1. You may enter your business, trade, or "doing business as" (DBA) name on line 2.

c. **Partnership, LLC that is not a single-member LLC, C corporation, or S corporation.** Enter the entity's name as shown on the entity's tax return on line 1 and any business, trade, or DBA name on line 2.

d. **Other entities.** Enter your name as shown on required U.S. federal tax documents on line 1. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on line 2.

e. **Disregarded entity.** For U.S. federal tax purposes, an entity that is disregarded as an entity separate from its owner is treated as a "disregarded entity." See Regulations section 301.7701-2(c)(2)(iii). Enter the owner's name on line 1. The name of the entity entered on line 1 should never be a disregarded entity. The name on line 1 should be the name shown on the income tax return on which the income should be reported. For example, if a foreign LLC that is treated as a disregarded entity for U.S. federal tax purposes has a single owner that is a U.S. person, the U.S. owner's name is required to be provided on line 1. If the direct owner of the entity is also a disregarded entity, enter the first owner that is not disregarded for federal tax purposes. Enter the disregarded entity's name on line 2, "Business name/disregarded entity name." If the owner of the disregarded entity is a foreign person, the owner must complete an appropriate Form W-8 instead of a Form W-9. This is the case even if the foreign person has a U.S. TIN.

Line 2

If you have a business name, trade name, DBA name, or disregarded entity name, you may enter it on line 2.

Line 3

Check the appropriate box on line 3 for the U.S. federal tax classification of the person whose name is entered on line 1. Check only one box on line 3.

IF the entity/person on line 1 is a(n) . . .	THEN check the box for . . .
• Corporation	Corporation
• Individual • Sole proprietorship, or • Single-member limited liability company (LLC) owned by an individual and disregarded for U.S. federal tax purposes.	Individual/sole proprietor or single-member LLC
• LLC treated as a partnership for U.S. federal tax purposes, • LLC that has filed Form 8832 or 2553 to be taxed as a corporation, or • LLC that is disregarded as an entity separate from its owner but the owner is another LLC that is not disregarded for U.S. federal tax purposes.	Limited liability company and enter the appropriate tax classification. (P= Partnership; C= C corporation; or S= S corporation)
• Partnership	Partnership
• Trust/estate	Trust/estate

Line 4, Exemptions

If you are exempt from backup withholding and/or FATCA reporting, enter in the appropriate space on line 4 any code(s) that may apply to you.

Exempt payee code.

- Generally, individuals (including sole proprietors) are not exempt from backup withholding.
- Except as provided below, corporations are exempt from backup withholding for certain payments, including interest and dividends.
- Corporations are not exempt from backup withholding for payments made in settlement of payment card or third party network transactions.
- Corporations are not exempt from backup withholding with respect to attorneys' fees or gross proceeds paid to attorneys, and corporations that provide medical or health care services are not exempt with respect to payments reportable on Form 1099-MISC.

The following codes identify payees that are exempt from backup withholding. Enter the appropriate code in the space in line 4.

- 1—An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2)
- 2—The United States or any of its agencies or instrumentalities
- 3—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities
- 4—A foreign government or any of its political subdivisions, agencies, or instrumentalities
- 5—A corporation
- 6—A dealer in securities or commodities required to register in the United States, the District of Columbia, or a U.S. commonwealth or possession
- 7—A futures commission merchant registered with the Commodity Futures Trading Commission
- 8—A real estate investment trust
- 9—An entity registered at all times during the tax year under the Investment Company Act of 1940
- 10—A common trust fund operated by a bank under section 584(a)
- 11—A financial institution
- 12—A middleman known in the investment community as a nominee or custodian
- 13—A trust exempt from tax under section 664 or described in section 4947

The following chart shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 13.

IF the payment is for . . .	THEN the payment is exempt for . . .
Interest and dividend payments	All exempt payees except for 7
Broker transactions	Exempt payees 1 through 4 and 6 through 11 and all C corporations. S corporations must not enter an exempt payee code because they are exempt only for sales of noncovered securities acquired prior to 2012.
Barter exchange transactions and patronage dividends	Exempt payees 1 through 4
Payments over \$600 required to be reported and direct sales over \$5,000 ¹	Generally, exempt payees 1 through 5 ²
Payments made in settlement of payment card or third party network transactions	Exempt payees 1 through 4

¹ See Form 1099-MISC, Miscellaneous Income, and its instructions.

² However, the following payments made to a corporation and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, gross proceeds paid to an attorney reportable under section 6045(f), and payments for services paid by a federal executive agency.

Exemption from FATCA reporting code. The following codes identify payees that are exempt from reporting under FATCA. These codes apply to persons submitting this form for accounts maintained outside of the United States by certain foreign financial institutions. Therefore, if you are only submitting this form for an account you hold in the United States, you may leave this field blank. Consult with the person requesting this form if you are uncertain if the financial institution is subject to these requirements. A requester may indicate that a code is not required by providing you with a Form W-9 with "Not Applicable" (or any similar indication) written or printed on the line for a FATCA exemption code.

A—An organization exempt from tax under section 501(a) or any individual retirement plan as defined in section 7701(a)(37)

B—The United States or any of its agencies or instrumentalities

C—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities

D—A corporation the stock of which is regularly traded on one or more established securities markets, as described in Regulations section 1.1472-1(c)(1)(i)

E—A corporation that is a member of the same expanded affiliated group as a corporation described in Regulations section 1.1472-1(c)(1)(i)

F—A dealer in securities, commodities, or derivative financial instruments (including notional principal contracts, futures, forwards, and options) that is registered as such under the laws of the United States or any state

G—A real estate investment trust

H—A regulated investment company as defined in section 851 or an entity registered at all times during the tax year under the Investment Company Act of 1940

I—A common trust fund as defined in section 584(a) J—

A bank as defined in section 581

K—A broker

L—A trust exempt from tax under section 664 or described in section 4947(a)(1)

M—A tax exempt trust under a section 403(b) plan or section 457(g) plan

Note: You may wish to consult with the financial institution requesting this form to determine whether the FATCA code and/or exempt payee code should be completed.

Line 5

Enter your address (number, street, and apartment or suite number). This is where the requester of this Form W-9 will mail your information returns. If this address differs from the one the requester already has on file, write NEW at the top. If a new address is provided, there is still a chance the old address will be used until the payor changes your address in their records.

Line 6

Enter your city, state, and ZIP code.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN.

If you are a single-member LLC that is disregarded as an entity separate from its owner, enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

Note: See *What Name and Number To Give the Requester*, later, for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local SSA office or get this form online at www.SSA.gov. You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at www.irs.gov/Businesses and clicking on Employer Identification Number (EIN) under Starting a Business. Go to www.irs.gov/Forms to view, download, or print Form W-7 and/or Form SS-4. Or, you can go to www.irs.gov/OrderForms to place an order and have Form W-7 and/or SS-4 mailed to you within 10 business days.

If you are asked to complete Form W-9 but do not have a TIN, apply for a TIN and write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note: Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

Caution: A disregarded U.S. entity that has a foreign owner must use the appropriate Form W-8.

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if item 1, 4, or 5 below indicates otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). In the case of a disregarded entity, the person identified on line 1 must sign. Exempt payees, see *Exempt payee code*, earlier.

Signature requirements. Complete the certification as indicated in items 1 through 5 below.

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983.

You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983.

You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

4. Other payments. You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments made in settlement of payment card and third party network transactions, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), ABL accounts (under section 529A), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions. You must give your correct TIN, but you do not have to sign the certification.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account) other than an account maintained by an FFI	The actual owner of the account or, if combined funds, the first individual on the account ¹
3. Two or more U.S. persons (joint account maintained by an FFI)	Each holder of the account
4. Custodial account of a minor (Uniform Gift to Minors Act)	The minor ²
5. a. The usual revocable savings trust (grantor is also trustee)	The grantor-trustee ¹
b. So-called trust account that is not a legal or valid trust under state law	The actual owner ¹
6. Sole proprietorship or disregarded entity owned by an individual	The owner ³
7. Grantor trust filing under Optional Form 1099 Filing Method 1 (see Regulations section 1.671-4(b)(2)(i)(A))	The grantor*

For this type of account:	Give name and EIN of:
8. Disregarded entity not owned by an individual	The owner
9. A valid trust, estate, or pension trust	Legal entity ⁴
10. Corporation or LLC electing corporate status on Form 8832 or Form 2553	The corporation
11. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
12. Partnership or multi-member LLC	The partnership
13. A broker or registered nominee	The broker or nominee

For this type of account:	Give name and EIN of:
14. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity
15. Grantor trust filing under the Form 1041 Filing Method or the Optional Form 1099 Filing Method 2 (see Regulations section 1.671-4(b)(2)(i)(B))	The trust

¹ List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

² Circle the minor's name and furnish the minor's SSN.

³ You must show your individual name and you may also enter your business or DBA name on the "Business name/disregarded entity" name line. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

⁴ List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see *Special rules for partnerships*, earlier.

*Note: The grantor also must provide a Form W-9 to trustee of trust.

Note: If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

Secure Your Tax Records From Identity Theft

Identity theft occurs when someone uses your personal information such as your name, SSN, or other identifying information, without your permission, to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax preparer.

If your tax records are affected by identity theft and you receive a notice from the IRS, respond right away to the name and phone number printed on the IRS notice or letter.

If your tax records are not currently affected by identity theft but you think you are at risk due to a lost or stolen purse or wallet, questionable credit card activity or credit report, contact the IRS Identity Theft Hotline at 1-800-908-4490 or submit Form 14039.

For more information, see Pub. 5027, Identity Theft Information for Taxpayers.

Victims of identity theft who are experiencing economic harm or a systemic problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 1-877-777-4778 or TTY/TDD 1-800-829-4059.

Protect yourself from suspicious emails or phishing schemes.

Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to phishing@irs.gov. You may also report misuse of the IRS name, logo, or other IRS property to the Treasury Inspector General for Tax Administration (TIGTA) at 1-800-366-4484. You can forward suspicious emails to the Federal Trade Commission at spam@uce.gov or report them at www.ftc.gov/complaint. You can contact the FTC at www.ftc.gov/idtheft or 877-IDTHEFT (877-438-4338). If you have been the victim of identity theft, see www.IdentityTheft.gov and Pub. 5027.

Visit www.irs.gov/IdentityTheft to learn more about identity theft and how to reduce your risk.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons (including federal agencies) who are required to file information returns with the IRS to report interest, dividends, or certain other income paid to you; mortgage interest you paid; the acquisition or abandonment of secured property; the cancellation of debt; or contributions you made to an IRA, Archer MSA, or HSA. The person collecting this form uses the information on the form to file information returns with the IRS, reporting the above information. Routine uses of this information include giving it to the Department of Justice for civil and criminal litigation and to cities, states, the District of Columbia, and U.S. commonwealths and possessions for use in administering their laws. The information also may be disclosed to other countries under a treaty, to federal and state agencies to enforce civil and criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism. You must provide your TIN whether or not you are required to file a tax return. Under section 3406, payers must generally withhold a percentage of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to the payer. Certain penalties may also apply for providing false or fraudulent information.

FORM 12

TRENCH SAFETY

This form must be completed and signed by the Respondent.

Failure to complete this form may result in the solicitation being declared non-responsive.

Respondent acknowledges that the Florida Trench Safety Act, Section 553.60 et. seq., which became effective October 1, 1990, shall be in effect during the period of construction of the project. The respondent by signing and submitting the solicitation is, in writing, assuring that it will perform any trench excavation in accordance with applicable trench safety standards. The respondent further identifies the following separate item of cost of compliance with the applicable trench safety standards as well as the method of compliance:

Method of Compliance

Cost

Total \$ _____

Respondent acknowledges that this cost is included in the applicable items of their submittal and in the Grand Total Solicitation Price. Failure to complete the above will result in the solicitation being declared non-responsive.

The Respondent is, and the Owner and Engineer are not, responsible to review or assess Respondent's safety precautions, programs or costs, or the means, methods, techniques or technique adequacy, reasonableness of cost, sequences or procedures of any safety precaution, program or cost, including but not limited to, compliance with any and all requirements of Florida Statute Section 553.60 et. seq. cited as the "Trench Safety Act." Respondent is, and the owner and Engineer are not, responsible to determine if any safety related standards apply to the project, including but not limited to, the "Trench Safety Act."

Witness Signature

Contractor's Signature

Witness Printed Name

Printed Name

Witness Address

Title

Date

Date

- END OF SECTION -

Form 13

Bid Guaranty Form

(Construction)

STATE OF FLORIDA

KNOW ALL MEN BY THESE PRESENTS:

That we _____, as Principal, and _____, as

Surety, are held and firmly bound unto the City of Hollywood in the sum of _____

_____ Dollars (\$ _____

of the United States, amounting to 5% of the total SOLICITATION Price, for the payment of said sum, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal has submitted the accompanying SOLICITATION, dated _____ 20__ for

**SOLICITATION- IFB-211-24-JJ – Membrane Softening Plant
Membrane Replacement at the Water Treatment Plant**

NOW, THEREFORE, if the principal shall not withdraw said SOLICITATION within 90 days after date of the same and shall within ten days after the prescribed forms are presented to him for signature, enter into a written contract with the CITY, in accordance with the SOLICITATION as accepted, and give bond with good and sufficient surety or sureties, and provide the necessary Insurance Certificates as may be required for the faithful performance and proper fulfillment of such Contract, then this obligation shall be null and void.

Approved SOLICITATION Bond

In the event of the withdrawal of said SOLICITATION within the specified period, or the failure to enter into such contract and give such bond and insurance within the specified time, the principal and the surety shall pay to the City of Hollywood the difference between the amount specified in said SOLICITATION and such larger amount for which the City of Hollywood may in good faith contract with another party to perform the work and/or supply the materials covered by said SOLICITATION.

IN WITNESS WHEREOF, the above bound parties have executed this statement under their several seals this _____ day of _____, 20____, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

WHEN THE PRINCIPAL IS AN INDIVIDUAL:

Signed, sealed and delivered in the presence of:

Witness

Signature of Individual

Address

Printed Name of Individual

Witness

Address

WHEN THE PRINCIPAL IS A CORPORATION:

Attest:

Secretary

Name of Corporation

Business Address

By: _____
(Affix Corporate Seal)

Printed Name

Official Title

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the secretary of the Corporation named as Principal in the attached bond; that _____ who signed the said bond on behalf of the Principal, was then _____ of said Corporation; that I know his signature, and his signature thereto is genuine and that said bond was duly signed, sealed and attested for and on behalf of said Corporation by authority of its governing body.

(SEAL)
Secretary

Approved SOLICITATION Bond

TO BE EXECUTED BY CORPORATE SURETY:

Attest:

Secretary

Corporate Surety

Business Address

BY: _____
(Affix Corporate Seal)

Attorney-in-Fact

Name of Local Agency

Business Address

STATE OF FLORIDA

Before me, a Notary Public, duly commissioned, qualified and acting, personally appeared,
_____ to me well known, who being by me first duly sworn upon
oath says that he is the attorney-in-fact for the _____ and
that the has been authorized by _____ to execute the forgoing
bond on behalf of the CONTRACTOR named therein in favor of the City of Hollywood, Florida.
Subscribed and sworn to before me this _____ day of __, 20__

Notary Public, State of Florida

My Commission Expires:

- END OF SECTION-

Form 14

LIST OF SUBCONTRACTORS

The Respondent shall list below the name and address of each Subcontractor who will perform work under this Contract, and shall also list the portion of the work which will be done by such Subcontractor. After the opening of Submittals, changes or substitutions will be allowed with written approval of the City of Hollywood. Subcontractors must be properly licensed.

	Work to be Performed	Subcontractor's Name / Address
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____
6.	_____	_____
7.	_____	_____
8.	_____	_____
9.	_____	_____
10.	_____	_____

NOTE: Attach additional sheets if required.

- END OF SECTION -

FORM 15

INFORMATION REQUIRED FROM BIDDERS

GENERAL INFORMATION

The Bidder shall furnish the following information. Failure to comply with this requirement may cause its rejection. Additional sheets shall be attached as required.

1. Contractor's Name/Address: _____

2. Contractor's Telephone Number: _____
and e-mail address: _____

3. Contractor's License (attach copy): _____
Primary Classification: _____
Broward County License Number (attach copy): _____

4. Number of years as a Contractor in construction work of the type involved in this
Contract: _____

5. List the names and titles of all officers of Contractor's firm:

6. Name of person who inspected site or proposed work for your firm:
Name: _____
Date of Inspection: _____

7. What is the last project of this nature you have completed?

8. Have you ever failed to complete work awarded to you; if so, where and why?

9. Name three individuals or corporations for which you have performed work and to which you refer:

10. List the following information concerning all contracts on hand as of the date of submission of this proposal (in case of co-venture, list the information for all coventures).

Name of Project	City	Total Contract Value	Contracted Date of Completion	% Completion to Date

(Continue list on inset sheet, if necessary)

11. What equipment do you own that is available for the work?

12. What equipment will you purchase for the proposed work?

13. List at least three similar projects completed within the last five (5) years by the bidder and project manager. For the purpose of this requirement, "similar" projects shall be considered to include municipal drinking water, reverse

osmosis (RO) and/or NF membrane systems with a permeate capacity of 2.0 mgd or greater that have been commissioned within the past five (5) years and are currently in successful service. Also, list at least one RO or NF membrane system project that is fully installed within the past ten (10) years having an aggregate permeate production capacity of 5.0 mgd which is currently in successful service. Include Owner, project value, completion date, reference contact information, and brief project description. The determination of whether a project is sufficiently similar shall be at the sole discretion of the City.

(Add sheets as requested.)

14. Name the Project Manager proposed for this project. Attach a copy of the project manager's resume.

NOTE: If requested by CITY, the Bidder shall furnish a notarized financial statement, references and other information, sufficiently comprehensive to permit an appraisal of its current financial condition.

++ END OF SECTION

FORM 16

PROPOSAL

TO THE MAYOR AND COMMISSIONERS
CITY OF HOLLYWOOD, FLORIDA

SUBMITTED _____

Dear Mayor and Commissioners:

The undersigned, as BIDDER, hereby declares that the only person or persons interested in the Proposal as principal or principals is or are named herein and that no other person than herein mentioned has any interest in this Proposal or in the Contract to be entered into; that this Proposal is made without connection with any other person, company or parties making a Bid or Proposal; and that it is in all respects fair and in good faith without collusion or fraud.

The BIDDER further declares that he has examined the site of the Work and informed himself fully in regard to all conditions pertaining to the place where the Work is to be done; that he has examined the Drawings and Specifications for the Work and contractual documents relative thereto, including the Notice to Bidders, Instructions to Bidders, Proposal Bid Form, Form of Bid Bond, Form of Contract and Form of Performance Bond, General, Supplementary and Technical Specifications, Addenda, Drawings, and Local Preference Program, Exhibit A, and has read all of the Provisions furnished prior to the opening of bids; and that he has satisfied himself relative to the work to be performed.

The undersigned BIDDER has not divulged to, discussed or compared his bid with other bidders and has not colluded with any other BIDDER of parties to this bid whatever.

If this Proposal is accepted, the undersigned BIDDER proposes and agrees to enter into and execute the Contract with the City of Hollywood, Florida, in the form of Contract specified; of which this Proposal, Instructions to Bidders, General Specifications, Supplementary Conditions and Drawings shall be made a part for the performance of Work described therein; to furnish the necessary bond equal to one hundred (100) percent of the total Contract base bid, the said bond being in the form of a Cash Bond or Surety Bond prepared on the applicable approved bond form furnished by the CITY; to furnish all necessary materials, equipment, machinery, tools, apparatus, transportation, supervision, labor and all means necessary to construct and complete the work specified in the Proposal and Contract and called for in the Drawings and in the manner specified; to commence Work on the effective date established in the "Notice to Proceed" from the ENGINEER; and to substantially complete all Contract Work within 30 days with final completion within 45 days, and stated in the "Notice to Proceed" or pay liquidated damages for each calendar day in excess thereof, or such actual and consequential damages as may result therefrom, and to abide by the Local Preference Ordinance, Exhibit A.

The BIDDER acknowledges receipt of the following addenda:

No. _____ Dated _____
No. _____ Dated _____
No. _____ Dated _____

And the undersigned agrees that in case of failure on his part to execute the said Contract and the Bond within ten (10) days after being presented with the prescribed Contract forms, the check or Bid Bond accompanying his bid, and the money payable thereon, shall be paid into the funds of the City of Hollywood, Florida, otherwise, the check or Bid Bond accompanying this Proposal shall be returned to the undersigned.

Attached hereto is a certified check on the

_____ Bank of _____

or approved Bid Bond for the sum of

_____ Dollars (\$) according to the conditions under the Instructions to Bidders and provisions therein.

NOTE: If a Bidder is a corporation, the legal name of the corporation shall be set forth below, together with signature(s) of the officer or officers authorized to sign Contracts on behalf of the corporation and corporate seal; if Bidder is a partnership, the true name of the firm shall be set forth below with the signature(s) of the partner or partners authorized to sign Contracts in behalf of the partnership; and if the Bidder is an individual, his signature shall be placed below; if a partnership, the names of the general partners.

WHEN THE BIDDER IS AN INDIVIDUAL:

(Signature of Individual)

(Printed Name of Individual)

(Address)

WHEN THE BIDDER IS A SOLE PROPRIETORSHIP OR OPERATES UNDER A TRADE NAME:

(Name of Firm)

(Address)

(Signature of Individual) (SEAL)

WHEN THE BIDDER IS A PARTNERSHIP:

(Name of Firm) A Partnership

(Address)

By: _____
(SEAL)
(Partner)

Name and Address of all Partners:

WHEN THE BIDDER IS A JOINT VENTURE:

(Correct Name of Corporation)

By: _____ (SEAL)
(Address)

(Official Title)

As Joint Venture
(Corporate Seal)

Organized under the laws of the State of _____, and authorized by the law to make this bid and perform all Work and furnish materials and equipment required under the Contract Documents.

WHEN THE BIDDER IS A CORPORATION:

(Correct Name of Corporation)

By: _____
(SEAL)

(Official Title)

(Address of Corporation)

Organized under the laws of the State of _____, and authorized by the law to make this bid and perform all Work and furnish materials and equipment required under the Contract Documents.

**CERTIFIED COPY OF RESOLUTION OF
BOARD OF DIRECTORS**

(Name of Corporation)

RESOLVED that _____
(Person Authorized to Sign)

_____ of
(Title) (Name of Corporation)

be authorized to sign and submit the Bid or Proposal of this corporation for the following project:

**Membrane Softening Plant Membrane Replacement at the Water Treatment Plant
Project Number: 23-4260
Bid No. IFB-211-24-JJ**

The foregoing is a true and correct copy of the Resolution adopted by

_____ at a meeting of its Board of
(Name of Corporation)

Directors held on the _____ day of _____, 20_____.

By: _____

Title: _____

(SEAL)

The above Resolution MUST BE COMPLETED if the Bidder is a Corporation.

- END OF SECTION -

SECTION 00500

CONTRACT

THIS AGREEMENT, made and entered into, this ____ day of _____, A.D., 20__, by and between the CITY OF HOLLYWOOD, Florida, a municipal corporation of the State of Florida, part of the first part, (hereinafter sometimes called the "CITY"), and

Contractor

party of the second part (hereinafter sometimes called the "CONTRACTOR").

WITNESSETH: The parties hereto, for the considerations herein- after set forth, mutually agree as follows:

Article 1. Scope of Work: The CONTRACTOR shall furnish all labor, materials, and equipment and perform all work in the manner and form provided by the Contract Documents, for:

**MEMBRANE SOFTENING PLANT MEMBRANE REPLACEMENT
AT THE WATER TREATMENT PLANT
IFB-211-24-JJ**

Article 2. The Contract Sum: The CITY shall pay to the CONTRACTOR, for the faithful performance of the Contract, in lawful money of the United States of America, and subject to additions and deductions as provided in the Contract Documents, as follows:

Based upon the prices shown in the Proposal heretofore submitted to the CITY by the CONTRACTOR, a copy of said Proposal being a part of these Contract Documents, the aggregate amount of this Contract being the sum of \$

Article 3. Partial and Final Payments: In accordance with the provisions fully set forth in the "General Conditions" of the "Specifications", and subject to additions and deductions as provided, the CITY shall pay the CONTRACTOR as follows:

- (a) On the 15th day, or the first business day thereafter, of each calendar month, the CITY shall make partial payments to the CONTRACTOR on the basis of a duly certified and approved estimate of work performed during the preceding calendar month by the CONTRACTOR, less five percent (5%) of the amount of such estimate which is to be retained by the CITY until all work has been performed strictly in accordance with this Agreement and until such work has been accepted by the CITY. The parties' rights and obligations regarding retainage are further specified in Florida Statute Section 218.735.
- (b) Upon submission by the CONTRACTOR of evidence satisfactory to the CITY that all payrolls, material bills and other costs incurred by the CONTRACTOR

in connection with the construction of the WORK have been paid in full, and also, after all guarantees that may be required in the Specifications have been furnished and are found acceptable by the CITY, final payment on account of this Agreement shall be made within sixty (60) days after completion by the CONTRACTOR of all work covered by this Agreement and acceptance of such work by the ENGINEER and approved by the CITY.

Article 4. Time of Completion: The CONTRACTOR shall commence work to be performed under this Contract within ten (10) consecutive calendar days after date of written Notice To Proceed and shall fully complete the Contract in accordance within the Contract Documents and meet all intermediate milestone completion dates required after said date of written notice as set forth in the Proposal, as may be modified by Instructions to Bidders, and stated in the Notice to Proceed.

It is mutually agreed between the parties hereto, that time is the essence, and in the event that construction of the WORK is not completed within the Contract Time and per intermediate dates, as may have been modified solely in accordance with the General Conditions of this Contract, that from the compensation otherwise to be paid to the CONTRACTOR, the CITY is authorized and shall retain, for each day thereafter, Sundays and holidays included, the sum set forth in the Supplementary General Conditions of this Contract as liquidated damages sustained by the CITY in the event of such default by the CONTRACTOR, or shall withhold such compensation for actual and consequential damages as may be stated therein or contemplated therefrom.

Article 5. Additional Bond: It is further mutually agreed between the parties hereto, that if, at any time after the execution of this Agreement and the Payment and Performance Bonds required herein for the express purpose of assuring the faithful performance of the Contractor's work hereto attached, the CITY shall deem the surety or sureties' to be unsatisfactory, or, if for any reason, said bonds cease to be adequate to cover the performance of the work, the CONTRACTOR shall, at his expense, within five (5) days after receipt of notice from the CITY furnish an additional bond or bonds in such form and amount, and with such surety or sureties as shall be satisfactory to the CITY. In such event, no further payment to the CONTRACTOR shall be deemed to be due under this agreement until such new or additional security for the faithful performance of the work shall be furnished in manner and form satisfactory to the CITY.

Article 6. Contract Documents: All of the documents hereinafter listed form the Contract and they are as fully a part of the Contract as if hereto attached, or repeated in this Agreement:

- | | |
|--------------------------------------|--------------------------------------|
| 1. Notice to Bidders | 9. Contract |
| 2. Instruction to Bidders | 10. Performance Bond |
| 3. Proposal | 11. Payment Bond |
| 4. Proposal Bid Form | 12. General Conditions |
| 5. Bid Bond | 13. Supplementary General Conditions |
| 6. Information Required from Bidders | 14. Addenda |
| 7. Local Preference | 15. Specifications |
| 8. Trench Safety Form | 16. Drawings |

Article 7. The rate of wages and fringe benefits, or cash equivalent, for all laborers, mechanics and apprentices employed by any contractor or subcontractor on the work covered by the contract shall be not less than the prevailing rate of wages and fringe benefit payments or cash equivalent for similar skills or classifications of work as established by the General Wage Decision by the United States Department of Labor for Broward County, Florida that is in effect prior to the date the city issues its invitation for bids. If the General Wage Decision fails to provide for a fringe benefit rate for any worker classification, then the fringe benefit rate applicable to the worker classification shall be the fringe benefit rate applicable to the worker classification with a fringe benefit rate that has a basic hourly wage closest in dollar amount to the worker classification for which no fringe benefit rate has been provided.

Article 8. No additional work or extras shall be performed unless the same be duly authorized by appropriate action of the City.

Article 9. That in the event either party brings suit for enforcement of disagreement, the prevailing party shall be entitled to attorney's fees and court costs in addition to any other remedy afforded by law.

Article 10. The Contractor shall guarantee the complete project against poor workmanship and faulty materials for a period of twelve (12) months after final payment and shall immediately correct any defects which may appear during this period upon notification by the City or the Engineer.

Article 11. The making and acceptance of the final payment shall constitute a waiver of all claims by the Contractor, except those previously made and still unsettled.

IN WITNESS WHEREOF the parties hereto have executed this Agreement on the day and date first above written in three (3) counterparts, each of which shall, without proof or accounting for the other counterparts, be deemed an original contract:

THE CITY OF HOLLYWOOD, FLORIDA
Party of the First Part

By: _____ (SEAL)
JOSH LEVY, MAYOR

ATTEST:

PATRICIA A. CERNY, MMC
City Clerk

WHEN THE CONTRACTOR IS A CORPORATION:

Attest:

Secretary

(Correct Name of Corporation)

BY: _____ (SEAL)
President

APPROVED AS TO FORM:

APPROVED AS TO FINANCE:

By _____
DOUGLAS R. GONZALES
City Attorney

By _____
STEPHANIE TINSLEY
Financial Services Department Director

CERTIFICATE

**STATE OF FLORIDA)
COUNTY OF BROWARD)**

I HEREBY CERTIFY that a meeting of the Board of Directors of _____,
a corporation under the laws of the State of _____, was held on _____,
20___, and the following resolution was duly passed and adopted:

"RESOLVED, that _____ as _____ President of the corporation,
be and he is hereby authorized to execute the contracts on behalf of this
corporation, and that his execution thereof, attested by the Secretary of
the corporation and with corporate seal affixed, shall be the official act and
deed of this corporation."

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of
the corporation, this _____ day of _____, 20___.

Secretary

- END OF SECTION -

SECTION 00500

CONTRACT

THIS AGREEMENT, made and entered into, this ____ day of _____, A.D., 20__, by and between the CITY OF HOLLYWOOD, Florida, a municipal corporation of the State of Florida, part of the first part, (hereinafter sometimes called the "CITY"), and

Contractor

party of the second part (hereinafter sometimes called the "CONTRACTOR").

WITNESSETH: The parties hereto, for the considerations herein- after set forth, mutually agree as follows:

Article 1. Scope of Work: The CONTRACTOR shall furnish all labor, materials, and equipment and perform all work in the manner and form provided by the Contract Documents, for:

**MEMBRANE SOFTENING PLANT MEMBRANE REPLACEMENT
AT THE WATER TREATMENT PLANT
IFB-211-24-JJ**

Article 2. The Contract Sum: The CITY shall pay to the CONTRACTOR, for the faithful performance of the Contract, in lawful money of the United States of America, and subject to additions and deductions as provided in the Contract Documents, as follows:

Based upon the prices shown in the Proposal heretofore submitted to the CITY by the CONTRACTOR, a copy of said Proposal being a part of these Contract Documents, the aggregate amount of this Contract being the sum of \$

Article 3. Partial and Final Payments: In accordance with the provisions fully set forth in the "General Conditions" of the "Specifications", and subject to additions and deductions as provided, the CITY shall pay the CONTRACTOR as follows:

- (a) On the 15th day, or the first business day thereafter, of each calendar month, the CITY shall make partial payments to the CONTRACTOR on the basis of a duly certified and approved estimate of work performed during the preceding calendar month by the CONTRACTOR, less five percent (5%) of the amount of such estimate which is to be retained by the CITY until all work has been performed strictly in accordance with this Agreement and until such work has been accepted by the CITY. The parties' rights and obligations regarding retainage are further specified in Florida Statute Section 218.735.
- (b) Upon submission by the CONTRACTOR of evidence satisfactory to the CITY that all payrolls, material bills and other costs incurred by the CONTRACTOR

in connection with the construction of the WORK have been paid in full, and also, after all guarantees that may be required in the Specifications have been furnished and are found acceptable by the CITY, final payment on account of this Agreement shall be made within sixty (60) days after completion by the CONTRACTOR of all work covered by this Agreement and acceptance of such work by the ENGINEER and approved by the CITY.

Article 4. Time of Completion: The CONTRACTOR shall commence work to be performed under this Contract within ten (10) consecutive calendar days after date of written Notice To Proceed and shall fully complete the Contract in accordance within the Contract Documents and meet all intermediate milestone completion dates required after said date of written notice as set forth in the Proposal, as may be modified by Instructions to Bidders, and stated in the Notice to Proceed.

It is mutually agreed between the parties hereto, that time is the essence, and in the event that construction of the WORK is not completed within the Contract Time and per intermediate dates, as may have been modified solely in accordance with the General Conditions of this Contract, that from the compensation otherwise to be paid to the CONTRACTOR, the CITY is authorized and shall retain, for each day thereafter, Sundays and holidays included, the sum set forth in the Supplementary General Conditions of this Contract as liquidated damages sustained by the CITY in the event of such default by the CONTRACTOR, or shall withhold such compensation for actual and consequential damages as may be stated therein or contemplated therefrom.

Article 5. Additional Bond: It is further mutually agreed between the parties hereto, that if, at any time after the execution of this Agreement and the Payment and Performance Bonds required herein for the express purpose of assuring the faithful performance of the Contractor's work hereto attached, the CITY shall deem the surety or sureties' to be unsatisfactory, or, if for any reason, said bonds cease to be adequate to cover the performance of the work, the CONTRACTOR shall, at his expense, within five (5) days after receipt of notice from the CITY furnish an additional bond or bonds in such form and amount, and with such surety or sureties as shall be satisfactory to the CITY. In such event, no further payment to the CONTRACTOR shall be deemed to be due under this agreement until such new or additional security for the faithful performance of the work shall be furnished in manner and form satisfactory to the CITY.

Article 6. Contract Documents: All of the documents hereinafter listed form the Contract and they are as fully a part of the Contract as if hereto attached, or repeated in this Agreement:

- | | |
|--------------------------------------|--------------------------------------|
| 1. Notice to Bidders | 9. Contract |
| 2. Instruction to Bidders | 10. Performance Bond |
| 3. Proposal | 11. Payment Bond |
| 4. Proposal Bid Form | 12. General Conditions |
| 5. Bid Bond | 13. Supplementary General Conditions |
| 6. Information Required from Bidders | 14. Addenda |
| 7. Local Preference | 15. Specifications |
| 8. Trench Safety Form | 16. Drawings |

Article 7. The rate of wages and fringe benefits, or cash equivalent, for all laborers, mechanics and apprentices employed by any contractor or subcontractor on the work covered by the contract shall be not less than the prevailing rate of wages and fringe benefit payments or cash equivalent for similar skills or classifications of work as established by the General Wage Decision by the United States Department of Labor for Broward County, Florida that is in effect prior to the date the city issues its invitation for bids. If the General Wage Decision fails to provide for a fringe benefit rate for any worker classification, then the fringe benefit rate applicable to the worker classification shall be the fringe benefit rate applicable to the worker classification with a fringe benefit rate that has a basic hourly wage closest in dollar amount to the worker classification for which no fringe benefit rate has been provided.

Article 8. No additional work or extras shall be performed unless the same be duly authorized by appropriate action of the City.

Article 9. That in the event either party brings suit for enforcement of disagreement, the prevailing party shall be entitled to attorney's fees and court costs in addition to any other remedy afforded by law.

Article 10. The Contractor shall guarantee the complete project against poor workmanship and faulty materials for a period of twelve (12) months after final payment and shall immediately correct any defects which may appear during this period upon notification by the City or the Engineer.

Article 11. The making and acceptance of the final payment shall constitute a waiver of all claims by the Contractor, except those previously made and still unsettled.

IN WITNESS WHEREOF the parties hereto have executed this Agreement on the day and date first above written in three (3) counterparts, each of which shall, without proof or accounting for the other counterparts, be deemed an original contract:

THE CITY OF HOLLYWOOD, FLORIDA
Party of the First Part

By: _____ (SEAL)
JOSH LEVY, MAYOR

ATTEST:

PATRICIA A. CERNY, MMC
City Clerk

WHEN THE CONTRACTOR IS A CORPORATION:

Attest:

Secretary

(Correct Name of Corporation)

BY: _____ (SEAL)
President

APPROVED AS TO FORM:

APPROVED AS TO FINANCE:

By _____
DOUGLAS R. GONZALES
City Attorney

By _____
STEPHANIE TINSLEY
Financial Services Department Director

CERTIFICATE

**STATE OF FLORIDA)
COUNTY OF BROWARD)**

I HEREBY CERTIFY that a meeting of the Board of Directors of _____,
a corporation under the laws of the State of _____, was held on _____,
20___, and the following resolution was duly passed and adopted:

"RESOLVED, that _____ as _____ President of the corporation,
be and he is hereby authorized to execute the contracts on behalf of this
corporation, and that his execution thereof, attested by the Secretary of
the corporation and with corporate seal affixed, shall be the official act and
deed of this corporation."

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of
the corporation, this _____ day of _____, 20___.

Secretary

- END OF SECTION -

SECTION 00610

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

That we _____,
Name Address Tel. No.

as Principal, and _____,
Name Address Tel. No.

as Surety, are held and firmly bound unto the City of Hollywood in the sum of _____ Dollars (\$ _____), for the payment of said sum we bind ourselves, our heirs, executors, administrators and assigns, jointly and severally, for the faithful performance of a certain written contract, dated the _____ day of _____, 20____ entered into between the Principal and the City of Hollywood, Florida, for the installation of **MEMBRANE SOFTENING PLANT MEMBRANE REPLACEMENT AT THE WATER TREATMENT PLANT**

A copy of said Contract, **No. 23-4260**, is incorporated herein by reference and is made a part hereof as if fully copied herein.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION ARE SUCH, that if the Principal shall in all respects comply with the terms and conditions of said Contract and his obligations thereunder, including all of the Contract Documents (that include the Notice to Bidders, Instructions to Bidders, Proposal, Proposal Bid Form, Basis of Payment, Approved Bid Bond, Trench Safety Form, Information Required from Bidders, Contract, Performance Bond, Payment Bond, General and Supplementary General Conditions, Technical Specifications, Addenda and Drawings), therein referred to and made a part thereof, and such alterations as may be made in said Drawings and Specifications as therein provided for, and shall indemnify and save harmless the City of Hollywood against and from all expenses, damages, injury or conduct, want of care of skill, negligence or default, including patent infringement on the part of said Principal, his agents or employees, in the execution or performance of said Contract, including errors in the Drawings furnished by said Principal, and further, if the Principal shall promptly make payments to all who supply him, with labor and/or materials, used directly or indirectly by the Principal in the prosecution of the work provided for in said Contract, then this obligation shall be null and void; otherwise, the Principal and Surety, jointly and severally, agree to pay the City of Hollywood any difference between the sum that the City of Hollywood may be obliged to pay for the completion of said work, by Contract or otherwise, and the sum that the City of Hollywood would have been obliged to pay for the completion said work had the Principal properly executed all of the provisions of said Contract, and any damages, whether direct, indirect, or consequential, which the City of Hollywood may incur as a result of the failure of the said Principal to properly execute all of the provisions of said Contract.

AND, the said Principal and Surety hereby further bind themselves, their successors, executors, administrators and assigns, jointly and severally, that they will amply and fully protect the City of Hollywood against, and will pay any and all amounts, damages, costs and judgments which may be recovered against or which the Owner may be called upon to pay to any person or corporation by reason of any damage arising from the performance of the said work, repair or maintenance thereof, or

the manner of doing the same, or his agents or his servants, or the infringements of any patent rights by reason of the use of any material furnished or work done, as aforesaid or otherwise.

AND, the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or the Specifications and Drawings accompanying the same, shall in any way affect its obligations on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the Specifications and Drawings.

WHEN THE PRINCIPAL IS AN INDIVIDUAL:

Signed, sealed and delivered in the presence of:

(Witness)

(Signature of Individual)

(Address)

(Printed Name of Individual)

(Witness)

(Address)

WHEN THE PRINCIPAL IS A SOLE PROPRIETORSHIP OR OPERATES UNDER A TRADE NAME:

Signed, sealed and delivered in the presence of:

(Witness)

(Name of Firm)

(Address)

By: _____ (Seal)
(Signature of Individual)

(Witness)

(Address)

WHEN THE PRINCIPAL IS A PARTNERSHIP:

Signed, sealed and delivered in the presence of:

(Witness)

(Name of Partnership)

(Address)

By: _____ (Seal)
(Partner)

(Witness)

(Printed Name of Partner)

(Address)

WHEN THE PRINCIPAL IS A CORPORATION:

Attest:

(Secretary)

(Name of Corporation)

By: _____ (Seal)
(Affix Corporate Seal)

(Printed Name)

(Official Title)

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the Secretary of the _____ corporation named as _____ Principal in _____ the _____ within _____ bond; that _____, who signed the said bond on behalf of the Principal was then _____ of said corporation; that I know his signature, and his signature thereto is genuine; and that said Bond was duly signed, sealed and attested for and on behalf of said corporation by authority of its governing body.

(SEAL)
Secretary

TO BE EXECUTED BY CORPORATE SURETY

Attest:

(Secretary)

(Corporate Surety)

(Business Address)

By: _____
(Affix Corporate Seal)

(Attorney-In-Fact)

(Name of Local Agency)

(Business Address)

STATE OF FLORIDA

Before me, a Notary Public, duly commissioned, qualified and acting, personally appeared, _____ to me well known, who being by me first duly sworn upon oath, says that he is the attorney-in-fact for the _____ and that he has been authorized by _____ to execute the foregoing bond on behalf of the CONTRACTOR named therein in favor of the City of Hollywood, Florida.

Subscribed and sworn to before me this _____ day of _____, 20_____.

Notary Public, State of Florida
My Commission Expires:

APPROVED AS TO FORM:

APPROVED AS TO FINANCE:

By _____
Douglas R. Gonzales
City Attorney

By _____
Stephanie Tinsley
Financial Services Department Director

- END OF SECTION -

SECTION 00620

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, _____
Name Address Tel. No.

As Principal and _____
Name Address Tel. No.

as Surety, are held and firmly bound to the CITY OF HOLLYWOOD, FLORIDA herein called the City, in the sum of _____

_____ Dollars (\$ _____) for the payment of said sum we bind ourselves, our heirs, executors, administrators and assigns, jointly and severally, for the faithful performance of a certain written contract dated the _____ day of _____, 20____, entered into between the Principal and the City of Hollywood, Florida for installation of the **MEMBRANE SOFTENING PLANT MEMBRANE REPLACEMENT AT THE WATER TREATMENT PLANT, Project No. 23-4260.**

Which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

THE CONDITION of this bond is that if Principal promptly makes payments to all claimants defined in Section 255.05 (1), F.S., supplying Principal with labor, materials or supplies used directly or indirectly by principal in the prosecution of the work provided for in the Contract, then this bond shall be null and void and of no further force and effect; otherwise to remain in full force and effect.

Said surety for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or any other changes in or under contract documents and compliance or noncompliance with any formalities connected with the contract does not affect Surety's obligation under this bond and Surety waives notice of any such change, extension of time, alteration or addition to the terms of the Contract or any other changes, compliance, or noncompliance to the terms of the Contract or to the Work or to the Specifications.

This bond is furnished pursuant to the statutory requirements for bond on public works projects being Florida Statute 255.05. Claimants are hereby notified that the Statute 255.05(2) specifically requires that notice be given to Contractor within 45 days after beginning to furnish labor, materials or supplies for the prosecution of the work that claimants intends to look to the bond for protection. Further notice is hereby given claimants that written notice of nonpayment within ninety (90) days after performance of the labor or after complete delivery of the materials or supplies must be delivered to the Contractor and to the Surety. Further notice is hereby given that no action for labor, materials or supplies may be instituted against the Contractor or the Surety on the bond after one year for the performance of the labor or completion of delivery of the materials or supplies.

Without modifying the foregoing, this bond shall be construed as requiring of the principal and surety no more and no less than is specified in F.S. 255.050.

SIGNED AND SEALED, this _____ day of _____, 20____.

PRINCIPAL:

ATTEST:

(Signature)

(Title)

(SEAL)

SURETY:

(Surety)

ATTEST:

(Signature)

(Attorney-in-Fact)

APPROVED AS TO FORM:

APPROVED AS TO FINANCE:

By _____
Douglas R. Gonzales
City Attorney

By _____
Stephanie Tinsley
Financial Services Department Director

- END OF SECTION -

ATTACHMENT B
GENERAL CONDITIONS, PUBLIC UTILITIES

Index to Articles

		<u>Page</u>
Article 1	Definitions	5-7
Article 2	Organizational Abbreviations	8-9
Article 3	Miscellaneous Preliminary Matters	
3.1	Contract Document Discrepancies	10
3.2	Submissions	10
3.3	Pre-Construction Conference	10
3.4	Contract Time	10
3.5	Computation of Time	10
3.6	Commencement of Work	10
3.7	Extension of Contract Time	11
3.8	Notice and Service Thereof	11
3.9	Separate Contract	11
3.10	Assignments of Contract	11
3.11	Patents	11
3.12	Federal Excise Tax	12
3.13	Savings Due to Excise Tax Exemptions	12
3.14	Overtime Work	13
3.15	Inspections and Testing During Overtime	13
3.16	Nights, Sunday or Holiday Work	13
3.17	Injury or Damage Claims	13
Article 4	Contract Documents	
4.1	Intent	14
4.2	Order of Precedence of Contract Documents	14
4.3	Reference to Standards	14
Article 5	Bonds and Insurance	
5.1	Bid Guarantee	15
5.2	Performance and Payment Bond	15
5.3	Signatures	15
5.4	Insurance Coverage	15
5.5	Certificates of Insurance	15
5.6	Insurance Limits of Liability	16

		<u>Page</u>
Article 6	Availability of Land; Reference Points	
6.1	Rights-Of-Way	17
6.2	Permits	17
6.3	Lines and Grades	17
Article 7	Contractor's Responsibilities	
7.1	Laws/Regulations to Be Observed	18
7.2	Indemnification of City	18
7.3	Guarantee of Payments	18
7.4	Permits and Licenses	18
7.5	Emergencies	19
7.6	Substitutes or "Or Equal"	19-20
7.7	Shop Drawings	21
7.8	Personnel	22-23
7.9	Safety and Protection	23
7.10	Traffic Control, Public Safety and Convenience	24
7.11	Use of Explosives	25
7.12	Loading of Structures	25
7.13	Concerning Subcontractors	25
7.14	Materials and Equipment	25-27
7.15	Temporary Utilities	27
7.16	Review of Records	27
7.17	Use of Premises	27
7.18	Contractor's Daily Reports	28
7.19	Record Documents	28
7.20	Cleanliness of the Site	28
7.21	Dust Control	28
7.22	Continuing the Work	28
7.23	Indemnification	28-29
Article 8	City's Responsibility	
8.1	Communications	30
8.2	Furnish Contract Documents	30
8.3	Furnish Right-of-Way	30
8.4	Timely Delivery of Materials	30
Article 9	Engineer's Status	
9.1	Authority of the Engineer	31
9.2	Access to the Work	31
9.3	Limitations on the Engineer's Responsibilities	32
9.4	Inspectors	32-33
9.5	Inspections	33

		<u>Page</u>
Article 10	Changes in the Work/Contract Price	
10.1	Changes in Work or Terms of Contract Documents	34
10.2	Supplemental Instructions - Clarifications	34
10.3	Field Orders/Change Orders	34-35
10.4	Value of Change Order Work	35-39
10.5	Notification and Claim for Change of Contract Price	39
10.6	Notice of Change	39
10.7	Records	40
10.8	Cancelled Items and Payments Therefore	40
10.9	Full Payment	40
Article 11	Changes in the Contract Time	
11.1	Change Order	41
11.2	Notification and Claim for Change of Contract Time	41
11.3	Basis for Extension	41
11.4	Change of Time due to Contract Execution Problems	42
11.5	Change of Time due to Change Order Evaluation	42
11.6	Change of Time and Inspection and Testing	42
11.7	Change of Time and Defective Work	42
11.8	Liquidated Damages	42
Article 12	Warranty and Guarantee; Test and Inspections; Correction, Removal or Acceptance of Defective Work	
12.1	Warranty and Guarantee	43
12.2	Tests and Inspections	43
12.3	Uncovering Work	43-44
12.4	City May Stop the Work	44
12.5	Correction or Removal of Defective Work	44
12.6	One Year Correction Period	44
12.7	Acceptance of Defective Work	45
12.8	City May Correct Defective Work	45
Article 13	Payments to the Contractor	
13.1	Basis of Payment	46
13.2	Unit Price Inclusion	46
13.3	Schedule of Values	46
13.4	Changed Conditions	46
13.5	Application for Progress Payment	46
13.6	Payment for Materials	47
13.7	Affidavit Required	47
13.8	Retainage	47
13.9	Contractor's Warranty of Title	47
13.10	Review of Application for Payment	47-48
13.11	Payment to the Contractor	48

		<u>Page</u>
Article 14	Substantial Completion, Partial Utilization, Final Clean Up, Inspection, Payment and Acceptance	
14.1	Substantial Completion	49
14.2	Partial Utilization	49-50
14.3	Final Clean-Up	50
14.4	Final Inspection	50
14.5	Final Application for Payment	51
14.6	Final Payment and Acceptance	51
14.7	Payment of Retainage without Final Completion	51
14.8	Contractor's Continuing Obligation	52
14.9	Waiver of Claims	52
Article 15	Suspension of Work and Termination	
15.1	City May Suspend Work	53
15.2	City May Terminate	53-54
15.3	Contractor May Stop Work or Terminate	55

**ATTACHMENT B
GENERAL CONDITIONS, PUBLIC UTILITIES**

**CITY OF HOLLYWOOD, FLORIDA
GENERAL CONDITIONS
FOR CONSTRUCTION CONTRACTS**

ARTICLE 1 - DEFINITIONS

In the interpretation of these Contract Documents the following terms shall have the meaning indicated:

ADDENDA - Written or graphic instruments issued prior to the opening of Bids which clarify, correct or change the Contract Documents.

CHANGE ORDER - A written order to CONTRACTOR executed in accordance with City procurement procedures, as amended authorizing an addition, deletion or revision in the work, or an adjustment in the Contract Price or the Contract Time, issued after the date of Award.

CITY (OWNER) - The City of Hollywood, Florida.

COMMISSION - The City Commission of the City of Hollywood, Florida, being the legislative body of the CITY as set forth in the City of Hollywood Charter.

CONTRACT - The written agreement between the CITY and the CONTRACTOR covering the work to be performed in accordance with the other Contract Documents which are attached to the Contract and made a part thereof.

CONTRACTOR - The person, firm, or corporation with whom the CITY has entered into the Contract.

CONTRACT DOCUMENTS - The Notice to Bidders, Instruction to Bidders, Proposal, Information Required of Bidders, all Bonds, Agreement, and all supporting documents, these General Requirements and Covenants, the Specifications, Drawings and Permits, together with all Addenda and Change Orders issued with respect thereto.

CONTRACT PRICE - Total monies payable by the CITY to the CONTRACTOR under the terms and conditions of the Contract Documents.

CONTRACT TIME - The number of days agreed to in the Proposal, commencing with the date of the Notice to Proceed for completion of the work.

CONTROL - shall mean having the primary power, direct or indirect, to influence the management of a business enterprise. The controlling party must have the demonstrable ability to make independent and unilateral business decisions on a day-to-day basis, as well as the independent and unilateral ability to make decisions which may influence and chart the future course of the business.

DATE OF SUBSTANTIAL COMPLETION - The date when the work on the project, or specified part thereof, is substantially completed in accordance with the Contract Documents, such that

the CITY can occupy or utilize the project or specified part thereof for the use and purpose for which it was intended as determined and accepted by the Engineer.

DAYS - Calendar days of 24 hours measured from midnight.

DRAWINGS - The drawings which show the character and scope of the work to be performed and which have been prepared by the DESIGN ENGINEER approved by ENGINEER and are referred to in and are a part of the Contract Documents.

ENGINEER - The Director of Public Utilities of the CITY of Hollywood, Florida, or his authorized designee.

EXCUSABLE DELAY - Delay caused by the CITY, hurricane, tornadoes, fires, floods, epidemics or labor strikes.

GENERAL CONDITIONS - That segment of the Contract Specifications incorporating the Provisions common to all CITY Construction Contracts.

INEXCUSABLE DELAY - Any delay caused either (i) by events or circumstances within the control of the CONTRACTOR not specified in the definition of excusable delay.

INSPECTOR - The authorized field representative of the ENGINEER.

LIQUIDATED DAMAGES - The amount prescribed in the General Requirements to be paid the CITY, or to be deducted from any payments due the CONTRACTOR for each day's delay in completing the whole or any specified portion of the work beyond the Contract Time.

NOTICE OF AWARD - The written notice by the CITY to the successful Bidder stating that upon his execution of the Agreement and other requirements as listed therein within the time specified the CITY will sign and deliver the Agreement.

NOTICE TO PROCEED - A written notice by the ENGINEER to the CONTRACTOR fixing the date on which the Contract Time will commence to run and on which the CONTRACTOR shall start to perform his obligation under the Contract Documents.

"OR EQUAL" - Equivalent or superior in construction, efficiency and effectiveness to a type, brand, model or process called out in the Contract Documents to establish a basis of quality as determined by the ENGINEER.

SHOP DRAWINGS - All certified affidavits, drawings, diagrams, illustrations, schedules and other data which are specifically prepared by CONTRACTOR, a Subcontractor, manufacturer, fabricator, supplier or distributor to illustrate some portion of the work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a manufacturer, fabricator, supplier or distributor and submitted by CONTRACTOR to illustrate material or equipment for some portion of the WORK.

SPECIFICATIONS - Division 1 through 17 of these Contract Documents, consisting of administrative details and written technical descriptions of materials, equipment, standards and workmanship.

SUPPLEMENTARY CONDITIONS - Division 1 of the Contract Specifications incorporating the provisions peculiar to a specific project.

SUBCONTRACTOR - An individual, firm or corporation having a direct contract with CONTRACTOR or with any other Subcontractor for the performance of a part of the work

SURETY - The person, firm or corporation responsible for the Bidder's acts in the execution of the Contract, or which is bound to the CITY with and for the CONTRACTOR to insure performance of the Contract and payment of all obligations pertaining to the work.

WORK - All the work materials or products specified, indicated, shown or contemplated in the Contract Documents to construct and complete the improvement, including all alterations, modifications, amendments or extension thereto made by Change Orders.

ARTICLE 2 - ORGANIZATIONAL ABBREVIATIONS

Abbreviations of organizations which may be used in these Specifications are:

AASHTO:	American Association of State Highway and Transportation Officials
ACI:	American Concrete Institute
AIA:	American Institute of Architects
AISC:	American Institute of Steel Construction
AITC:	American Institute of Timber Construction
ANSI:	American National Standards Institute
APWA:	American Public Works Association
ASTM:	American Society for Testing and Materials
ASCE:	American Society of Civil Engineers
ASME:	American Society of Mechanical Engineers
ASHRAE:	American Society of Heating, Refrigerating and Air Conditioning Engineers
AWPA:	American Wood Preservers Association
AWWA:	American Water Works Association
AWS:	American Welding Society
BCEQCB:	Broward County Environmental Quality Control Board
CRSI:	Concrete Reinforcing Steel Institute
FDEP:	Florida Department of Environmental Protection
FDNR:	Florida Department of Natural Resources
FDOT:	Florida Department of Transportation
FPL:	Florida Power and Light
IEEE:	Institute of Electrical and Electronic Engineers
NACE:	National Association of Corrosion Engineers
NCPI:	National Clay Pipe Institute

NEC: National Electrical Code

NEMA: National Electrical Manufacturers Association

NFPA: National Fire Protection Association

OSHA: Occupational Safety and Health Act

PCI: Prestressed Concrete Institute

SFBC: South Florida Building Code, Broward Edition, Latest Revision

SFWMD: South Florida Water Management District

SSPC: Structural Steel Painting Council

UL: Underwriters' Laboratories, Inc.

UNCLE: Utility Notification Center for Location before Excavation (1-800-432-4770)

USEPA: United States Environmental Protection Agency

USGS: United States Geological Survey

WWEMA: Water and Wastewater Equipment Manufacturers Association

ARTICLE 3 - MISCELLANEOUS PRELIMINARY MATTERS

3.1 Contract Document Discrepancies:

Any discrepancies, conflicts, errors or omissions found in the Contract Documents shall be promptly reported to the ENGINEER who will issue a correction, if necessary, in writing. The CONTRACTOR shall comply with any corrective measures regarding the same as prescribed by the ENGINEER.

3.2 Submissions:

Unless indicated otherwise in the Contract Documents, within seven days subsequent to the CONTRACTOR executing and submitting the required documents of Article 2.13 in Section II - Special Terms and Conditions, the CONTRACTOR shall submit to the ENGINEER an estimated progress schedule indicating the starting and completion days of the various stages of the work. A preliminary Schedule of Values and a preliminary schedule of Shop Drawing submissions may also be required by Section 01300 of Division 1 - General Requirements.

3.3 Pre-construction Conference:

The Contractor will be required to attend a mandatory Pre- Construction Conference for review of the above schedules, establishing procedures and establishing a working understanding among the parties as to the work.

3.4 Contract Time:

The Contract Time will commence on the date of the Notice to Proceed and shall exist for the total number of days as specified in Attachment C – Supplementary General Conditions, Section 1, Project Schedule as modified by any subsequent Change Orders, Unless the CONTRACTOR fails to complete the requirements of Section II - Special Terms and Conditions, the additional time in days (including weekends) required to correctly complete the documents will be deducted by CITY from the Contract Time specified by the CONTRACTOR in this Proposal.

3.5 Computation of Time:

When any period of time is referred to the Contract Documents by days, it shall be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a legal holiday, such day shall be omitted from the computation.

3.6 Commencement of Work:

The CONTRACTOR shall not perform work at the site prior to the date of the Notice to Proceed.

3.7 Extension of Contract Time:

Extensions of time shall be based solely upon the effect of delays to the work as a whole. Extensions of time shall not be granted for delays to the work, unless the CONTRACTOR can clearly demonstrate, through schedule analysis, that the delay to the work as a whole arose in accordance with Article 11, Changes in Contract Time and that such delays did or will, in fact, delay the progress of work as a whole. Time extensions shall not be allowed for delays to parts of the work that are not on the critical path of the Project schedule. Time extensions shall not be granted until all float or contingency time, at the time of the delay, available to absorb specific delays and associated impacts, is used.

3.8 Notice and Service Thereof:

All notices, demands, requests, instructions, approvals and claims shall be in writing. Notices, demands, etc. shall be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the business address as defined at the Pre-Construction Conference.

3.9 Separate Contract:

The CITY reserves the right to let other Contracts in connection with this Project. The CONTRACTOR shall afford other Contractors reasonable opportunity for the introduction and storage for their materials and the execution of their work and shall properly connect and coordinate his work with theirs.

3.10 Assignments of Contract:

No assignment by the CONTRACTOR of the Contract or of any part thereof, or any monies due or to become due thereunder shall be made.

3.11 Patents:

It is mutually understood and agreed that without exception, Contract prices are to include all royalties and costs arising from patents, trademarks, and copyrights in any way involved in the work. It is the intent that whenever the Contractor is required or desired to use any design, device, material or process covered by letters, patent, or copyright, the right for such use shall be provided for by suitable legal agreements with the Patentee or Owner and a copy of this agreement shall be filed with the ENGINEER. However, whether or not such an agreement is made or filed as noted, the CONTRACTOR and the Surety in all cases shall indemnify and save harmless the CITY from any and all claims for infringement by reason of the use of any such patented design, device, material or process, to be performed under the Contract, and shall indemnify the said CITY from any costs, expenses, and damages which it may be obliged to pay, by reason of such infringement, at any time during the prosecution or after the completion of the work.

3.12 Federal Excise Tax:

The forms needed for applying for exemption certificates for materials and equipment, normally subject to the Federal Excise Tax, may be obtained from the Director of Internal Revenue, Jacksonville, Florida.

The CONTRACTOR is solely responsible for obtaining the desired exemption certificate from the Federal Government.

3.13 Savings Due to Excise Tax Exemptions:

The Bidder shall include in the Bid price the estimated cost of all goods, supplies and equipment which will be incorporated in the Work and the taxes that the Bidder would be required to pay if the Bidder were to purchase such goods, supplies or equipment. By subsequent Change Order(s), the parties shall reduce the Bid price to reflect any goods, supplies and equipment purchased directly by City and the resulting tax savings due to City's exemption from Excise Taxes.

CONTRACTOR shall pay all sales, consumer, use and other similar taxes required to be paid by CONTRACTOR in accordance with the laws and regulations of the State of Florida and its political subdivisions. Consistent with the tax exemption for municipalities provided by state law, CITY and CONTRACTOR shall jointly operate so that CITY may purchase directly, goods, supplies and equipment which will be incorporated into the Work. The goods, supplies and equipment that will be purchased by CITY shall be approved in advance by the parties.

With respect to all goods, supplies and equipment to be purchased by CITY, CONTRACTOR shall, on behalf of CITY, take all actions necessary and appropriate to cause all purchases to be made and shall be responsible for delivery of all such goods, supplies and equipment, including verification of correct quantities and documents or orders, coordination of purchases and delivery schedules, sequence of delivery, unloading, handling and storage through installation, obtaining warranties and guarantees required by the Contract Documents, inspection and acceptance of the goods, supplies and equipment at the time of delivery, and other arrangements normally required for the particular goods, supplies or equipment purchased. Unless otherwise directed by CITY, such actions shall also include taking the lead in efforts to resolve any and all disputes with the vendor. CONTRACTOR shall ensure that each vendor of goods, supplies and equipment purchased by CITY agrees in writing to the terms and conditions contained in CITY'S standard purchase order, which terms and conditions are set forth in Attachment C - Supplementary General Conditions of the Contract Documents. Even though CITY may purchase such goods, supplies and equipment, the goods, supplies and equipment shall be stored at the site in the same manner as goods, supplies and equipment purchased by CONTRACTOR.

CONTRACTOR shall hold CITY harmless from delays in manufacturing, delivery, and other unforeseen conditions that may arise as part of the procurement of CITY-purchased goods, supplies and equipment.

3.14 Overtime Work:

The CONTRACTOR shall receive no additional compensation for overtime work, i.e., work in excess of eight hours in any one calendar day or 40 hours in any one calendar week, even though such overtime work may be required under emergency conditions and may be ordered by the ENGINEER in writing. Additional compensation will be paid the CONTRACTOR for overtime work only in the event extra work is ordered by the ENGINEER and the Change Order specifically authorizes the use of overtime work and then only to such extent as overtime wages are regularly being paid by the CONTRACTOR for overtime work of a similar nature in the same locality.

3.15 Inspections and Testing during Overtime:

The CONTRACTOR shall establish a normal work schedule which does not exceed eight hours per day in a normal work day nor 40 hours per week in a normal work week. Normal work days shall be Monday through Friday. Whenever CONTRACTOR's work requires scheduled overtime, unless such overtime work is specifically required by the Contract Documents, CONTRACTOR shall reimburse the CITY for the extra costs incurred for providing Inspectors. Overtime shall be scheduled only after CONTRACTOR obtains written permission from the CITY. A change order shall be prepared to cover the CITY costs. Inspector costs shall be charged to the CONTRACTOR at a rate of \$80.00 per hour with a minimum of four hours charged for weekends and holidays. If the CONTRACTOR has an overtime work force size of fifty or more persons a second Inspector will be required and the costs for two Inspectors will be \$160.00 per hour.

3.16 Nights, Sunday or Holiday Work:

Except upon specific permission of the ENGINEER, the CONTRACTOR shall not perform any work on Sundays or on legal State or Municipal holidays. In accordance with City of Hollywood Code of Ordinances, Section 21.49, no work between 6:00 p.m. and 8:00 a.m. will be permitted, except in case of an emergency, that violates Section 21.49 concerning noise levels. All costs of testing and inspection performed during night, Sunday or holiday work shall be borne by the CONTRACTOR. The CONTRACTOR shall notify all regulatory agencies, including but not limited to the City Police Department, Fire Department, and Code Enforcement Department.

3.17 Injury or Damage Claims:

Should CITY or CONTRACTOR suffer injury or damage to their person or property because of any error, omission or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, claim shall be made in writing to the other party within a reasonable time of the first observance of such injury or damage. However, nothing herein shall be deemed to affect the rights, privileges and immunities of City as are set forth in Section 768.28, Florida Statutes.

ARTICLE 4 - CONTRACT DOCUMENTS

4.1 Intent:

The Contract Documents comprise the entire Agreement between the CITY and CONTRACTOR concerning the work. The Contract Documents can be altered only by Change Order. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. It is the intent of the Contract Documents that the CONTRACTOR, for due consideration, shall furnish all equipment, material, supervision and labor, (except as may be specifically noted otherwise) required or necessary to complete the work in total accordance with said Documents. It is the intent of the Drawings and Specifications to describe the Project to be constructed in accordance with the Contract Documents. Any work that may reasonably be inferred from the Drawings or Specifications as being required in order to produce the intended result shall be supplied whether or not it is specifically called for.

4.2 Order of Precedence of Contract Documents:

In resolving differences resulting from conflicts, errors or discrepancies in any of the following Contract Documents, the order of precedence shall be as follows:

1. Permits
2. Change Orders
3. Contract Agreement
4. Specification
5. Drawings

Within the Specifications the order of precedence is as follows:

1. Addenda
2. Section I - Introduction
3. Section II – Special Terms and Conditions
4. General Terms & Conditions
5. Attachment C- Supplementary General Conditions
6. Attachment B - General Conditions
7. Division 1, General Requirements
8. Technical Specifications
9. Referenced Standard Specifications

With reference to the Drawings the order of precedence is as follows:

1. Figures Govern over Scaled Dimensions
2. Detail Drawings Govern over General Drawings
3. Change Order Drawings Govern over Contract Drawings
4. Contract Drawings Govern over Standard or Shop Drawings

4.3 Reference To Standards:

Any reference to standard Specifications, manuals or codes of any organization or governmental authority shall mean the latest edition, in effect as of the Bid Opening Date.

ARTICLE 5 - BONDS AND INSURANCE

5.1 Bid Guarantee:

Bidders maybe required to submit a Bid Guarantee in an amount indicated in the SECTION II - SPECIAL TERMS AND CONDITIONS. This Guarantee may be a Certified or Cashier's Check on a solvent National or State Bank, or a Bid Bond written by a Surety licensed to do business in Florida and rated at least "A", Class X in the latest edition of "Best's Key Rating Guide" published by A.M. Best Company.

5.2 Performance and Payment Bond:

CONTRACTOR shall furnish Performance and Payment Bonds, in amounts equal to the Contract Price as Security for the faithful performance and payment of CONTRACTOR's obligations. The Bond or Bonds shall remain in effect one year after the date of final payment. The Surety must be qualified as specified above in Paragraph 5.1. However, the City reserves the right to require additional bonds as set forth in Article 5 of the Contract.

5.3 Signatures:

All Bonds signed by an Agent must be accompanied by a Certified copy of the authority to act, with said copy having been signed (not typed nor printed) by an Officer of the Surety and carrying the seal of the Surety.

5.4 Insurance Coverage:

Within ten days from Notice of Award the CONTRACTOR shall purchase and maintain such insurance as specified in Article 2.25 of Section II – Special Terms and Requirements as will protect him from claims set forth below which may arise out of or result from the CONTRACTOR's operations under the Contract or Contract Documents, whether such operations be by himself or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable.

5.5 Certificates of Insurance:

Within ten days of award, the Contractor shall obtain a Certificate of Insurance reflecting the necessary coverages as required by the Contract Documents. Certificates of Insurance shall contain a provision that coverages afforded under the policies will not be canceled until at least 30 days prior written notice has been given to the CITY. The City of Hollywood must be named as additional insured on all coverage with the exception of Workmen's Compensation. Policies shall be issued by companies authorized to do business under the Laws of the State of Florida. Policyholders and Financial Ratings must be no less than "A" and Class X respectively in the latest edition of "Best Key Rating Guide", published by A.M. Best Company.

5.6 Insurance Limits of Liability:

The insurance required by this Article shall be written for no less than the level of liability specified in "Insurance Requirements", Section 2 of the Supplementary General Conditions, or required by law, whichever is greater. The insurance shall include contractual liability insurance applicable to the CONTRACTOR's obligations under this contract.

The level required in Section 2 of the Supplementary General Conditions will not be reduced for any reason.

ARTICLE 6 - AVAILABILITY OF LAND; REFERENCE POINTS

6.1 Rights-of-Way:

Lands or Rights-of-Way for the work to be constructed under the Contract will be provided by the CITY. Nothing contained in the Contract Documents shall be interpreted as giving the CONTRACTOR exclusive occupancy of the lands or Rights-of-Way provided. Any additional lands or Rights-of-Way required for construction operations shall be provided by the CONTRACTOR at his own expense; provided, that the CONTRACTOR shall not; and the CITY nor the ENGINEER shall not be liable for any claims or damages resulting from the CONTRACTOR's unauthorized trespass or use of any such properties.

6.2 Permits:

When required by Article 2.16 of the Section II – Special Terms and Conditions, the CONTRACTOR shall secure, from the agencies having jurisdiction, the necessary permits to create obstructions, to make excavations if required under the Contract, and to otherwise encroach upon Rights-of-Way, and to present evidence to the ENGINEER that such permission has been granted, before work is commenced. Regulations and requirements of all agencies concerned shall be strictly adhered to in the performance of the Contract. The enforcement of such requirements under the Contract shall not be made the basis for additional compensation.

6.3 Lines and Grades:

The CONTRACTOR shall furnish all grades and all other lines required for the proper execution of the work.

ARTICLE 7 - CONTRACTOR'S RESPONSIBILITIES

7.1 Laws/Regulations to Be Observed:

The CONTRACTOR shall familiarize himself and comply with all Federal, State, County and CITY laws, by-laws, ordinances or regulations controlling the action or operation of those engaged or employed in the work or affecting material used, and govern himself in accordance with them. He shall indemnify and save harmless the CITY and all of its officers, agents and employees against any claims or liability arising from or based on the violation of any such laws, by-laws, ordinances, regulations, orders or decrees, whether by himself or his employees or Subcontractors.

7.2 Indemnification of City:

- (a) Refer to ARTICLE 1.46 – INDEMNIFICATION AND HOLD HARMLESS AGREEMENT of Section IV – General Terms and Conditions.
- (b) Refer to ARTICLE 1.47 – PATENT AND COPYRIGHT INDEMNIFICATION of Section IV – General Terms and Conditions.
- (c) The provisions of (a) and (b) above shall survive the expiration or earlier termination of the Contract Documents.

7.3 Guarantee of Payments:

The CONTRACTOR guarantees the payments of all just claims for materials, supplies, tools, labor and other just claims against him, or any Subcontractor in connection with this Contract, and his bond will not be released by final acceptance and payment by the CITY unless all such claims are paid or released.

7.4 Permits and Licenses:

The CONTRACTOR shall obtain all permits and licenses required by the Contract Documents. A copy of the permit(s) and such conditions and requirements thereon are a part of the Contract Documents. Failure to obtain such permits or licenses shall subject the CONTRACTOR to the provisions of the South Florida Building Code, Broward Edition.

7.5 Emergencies:

In emergencies affecting the safety or protection of persons or the work or property at the site or adjacent thereto, CONTRACTOR, without special instruction or authorization from ENGINEER or CITY, is obligated to act to prevent threatened damage, injury or loss. CONTRACTOR shall give ENGINEER prompt written notice of any significant changes in the work or deviations from the Contract Documents caused thereby.

7.6 Substitutes or "Or Equal":

A. Substitutes or "Or-Equal" Materials or Equipment:

Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular supplier the naming of the item is intended to establish the type, function and quality required. Unless the name is followed by words indicating that no substitution is permitted, materials or equipment of other Suppliers may be accepted by the ENGINEER if sufficient information submitted by the CONTRACTOR to allow the ENGINEER to determine that the material or equipment proposed is equivalent or equal to that named. The ENGINEER will be allowed 30 days within which to evaluate each proposed substitute. The ENGINEER will be the sole judge of acceptability, and NO SUBSTITUTE WILL BE ORDERED, INSTALLED OR UTILIZED WITHOUT THE ENGINEER'S PRIOR WRITTEN ACCEPTANCE which will be evidenced by either a Change Order or an approved set of Shop Drawings. Requests for review of substitute items of material and equipment will not be accepted by the ENGINEER from anyone other than the CONTRACTOR. The procedure for review by the ENGINEER is as follows:

If the CONTRACTOR wishes to furnish or use a substitute item of material or equipment, the CONTRACTOR shall make written application to the ENGINEER for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified. In addition, the application shall

1. State that the evaluation and acceptance of the proposed substitute will not prejudice the CONTRACTOR's achievement of completion on time.
2. State whether or not acceptance of the substitute for use in the WORK will require a change in any of the Contract Documents to adapt design to the proposed substitute. The CONTRACTOR shall be responsible for any extra design adaptation costs associated with a proposed substitute.
3. State whether or not incorporation or use of the substitute in connection with the work is subject to payment of any license fee or royalty.
4. Provide complete substitute identification and description, including manufacturer's and local distributor's name and address, performance and test data, and reference standards.

5. Provide samples, as required by ENGINEER.
 6. Provide name and address of similar projects on which the proposed substitute has been used, and date of installation.
 7. Identify all variations of the proposed substitute from that specified.
 8. Indicate available maintenance, repair and replacement service.
 9. Submit an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other Contractors affected by the resulting change. The CONTRACTOR shall be responsible for the costs of redesign and claims of other Contractors.
 10. Provide any additional data about the proposed substitute as the ENGINEER may require of the CONTRACTOR.
- B. Substitute means, method, technique, sequence or procedure of construction:
- If a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents, the CONTRACTOR may furnish or utilize a substitute means, method, sequence, technique or procedure of construction acceptable to the ENGINEER, if the CONTRACTOR submits sufficient information to allow the ENGINEER to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents. The procedure for review by the ENGINEER will be similar to that provided in Paragraph 7.6 A.
- C. The CITY may require the CONTRACTOR to furnish at the CONTRACTOR's expense, a special performance guarantee or other surety with respect to any substitute.
- D. The ENGINEER will record time required by the ENGINEER and/or the ENGINEER's consultants in evaluating substitutions proposed by the CONTRACTOR and in making changes in the Contract Documents occasioned thereby. Whether or not the ENGINEER accepts a proposed substitute, THE CONTRACTOR SHALL REIMBURSE THE CITY FOR THE CHARGES OF THE ENGINEER AND THE ENGINEER'S CONSULTANTS FOR EVALUATING EACH PROPOSED SUBSTITUTE.
- E. Any and all costs which result from changes to/adaptations of the work shall be paid by the CONTRACTOR including but limited to design, materials, installation, etc.

7.7 Shop Drawings:

Shop Drawing submittals shall be as follows:

- A. The CONTRACTOR shall submit a sufficient number of copies of each Shop Drawing to enable the ENGINEER to retain three copies unless additional copies are specified in the Contract Documents. Resubmissions of Shop Drawings shall be made in the same quantity until final approval is obtained.
- B. The CONTRACTOR shall submit Shop Drawings for all equipment, apparatus, machinery, fixtures, piping, fabricated structures, manufactured articles and structural components Manufacturer's Certified Affidavit that the item supplied complies with the design Specifications, and all other submittal requirements.
- C. Shop Drawings for structural components, electrical or mechanical systems shall be Certified by a Registered Engineer of the discipline involved.
- D. The CONTRACTOR shall thoroughly review and check the Shop Drawings, and each and every copy shall show his approval thereon. If the Shop Drawings show or indicate departures from the Contract requirements, the CONTRACTOR shall make specific mention thereof in his letter of transmittal. Failure to point out such departures shall not relieve the CONTRACTOR from his responsibility to comply with the Drawings and Specifications.
- E. No approval will be given to partial submittals of Shop Drawings for items which interconnect and/or are interdependent. It is the CONTRACTOR's responsibility to assemble the Shop Drawings for all such interconnecting and/or interdependent items, check them himself and then make one submittal to the ENGINEER along with his comments as to compliance, non-compliance, or features requiring special attention.
- F. If catalog sheets or prints of manufacturer's standard drawings are submitted as Shop Drawings, any additional information or changes on such Drawings shall be typewritten or lettered in ink.
- G. The CONTRACTOR shall keep one set of Shop Drawings marked with the ENGINEER's approval at the job site at all times.
- H. Where a Shop Drawing or sample is required by the Specifications, no related work shall be commenced until the submittal has been reviewed and approved by the ENGINEER.
- I. Approval of the Shop Drawings shall constitute approval of the subject matter thereof only, and not of any structure, material, equipment or apparatus shown or indicated. The approval of the Shop Drawings will be general and shall not relieve the CONTRACTOR of responsibility for the accuracy of such Drawings, nor for the proper fitting and construction of the work, nor for the furnishing of materials or work required by the contract and not indicated on the Drawings. Approval shall not relieve the CONTRACTOR from responsibility for errors or omissions of any sort on the Shop Drawings.

7.8

Personnel:

A. Supervision and Superintendence:

1. The CONTRACTOR shall supervise and direct the work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the work in accordance with the Contract Documents. The CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences and procedures of construction, but the CONTRACTOR shall not be solely responsible for the negligence of others in the design or selection of a specific means, method, technique, sequence or procedure of construction which is indicated in and required by the Contract Documents. The CONTRACTOR shall be responsible to see that the finished work complies accurately with the Contract Documents.
2. The CONTRACTOR shall keep on the work at all times during its progress a competent resident Superintendent fluent in both oral and written communication in the English language, who shall not be replaced without written notice to the ENGINEER except under extraordinary circumstances. The Superintendent will be the CONTRACTOR's representative at the site and shall have authority to act on behalf of the CONTRACTOR. All communications given to the Superintendent shall be as binding as if given to the CONTRACTOR.

B. Workforce:

1. None but skilled workers shall be employed on work requiring special qualifications. When required in writing by the ENGINEER, the CONTRACTOR or any Subcontractor shall discharge any person who is, in the opinion of the ENGINEER, incompetent, disorderly or otherwise unsatisfactory, and shall not again employ such discharged person on the work except with the consent of the ENGINEER. Such discharge shall not be the basis of any claim for damages against the CITY or any CITY agents.
2. With respect to all skilled, semi-skilled and unskilled workers employed on the Project under this Contract, preference in employment shall be given to persons residing in Hollywood when such persons are available and qualified to perform the work to which the employment relates. No person shall be employed in violation of the State or National Labor Laws. No person under the age of 16 years shall be employed on a Project under the Contract. No person whose age or physical condition is such as to make his employment dangerous to his health or safety or to the health or safety of others shall be employed on the Project under this Contract; provided that this shall not operate against the employment of physically handicapped persons, otherwise employable where such persons may be safely assigned to work which they can ably perform. No person currently serving sentences in a penal or correctional institution and no inmate of an institution for

mentally defective shall be employed on a Project under this Contract without specific approval of the ENGINEER.

3. No discrimination shall be made in the employment of persons on the work by the CONTRACTOR or by any Subcontractor under him, because of the race, color, sex, age or religion of such persons, and there shall be full compliance with the provisions of applicable State and Federal laws in this regard.

7.9 Safety and Protection:

A. Federal Safety and Health Regulations:

The CONTRACTOR and Subcontractors shall comply with the provisions of the Occupational Safety and Health Standards, promulgated by the Secretary of Labor under the "Occupational Safety and Health Act of 1970".

B. Responsibilities:

The CONTRACTOR shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the work. The CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. All employees on the work and other persons who may be affected thereby.
2. All the work and all materials or equipment to be incorporated therein, whether in storage on or off the site.
3. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocating or replacement in the course of construction.

C. Designated Safety Officer:

The CONTRACTOR shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be the CONTRACTOR's Superintendent unless otherwise designated in writing by the CONTRACTOR to the ENGINEER.

D. Protection of the Work:

Until acceptance of the work by the CITY, it shall be under the charge and in care of the CONTRACTOR and he shall take every necessary precaution against injury or damage to the work by action of the elements or from the execution or from the non-execution of the work. The CONTRACTOR shall rebuild, restore and make good, at his own expense, all injuries or damages to any portion of the work occasioned by any of the above causes before its completion and acceptance.

7.10 Traffic Control, Public Safety and Convenience:

- A. The CONTRACTOR shall at all times conduct his work so as to assure the least possible obstruction to traffic and inconvenience to the general public, and provide adequate protection of persons and property in the vicinity of the work.
- B. WHEN THE NORMAL FLOW OF TRAFFIC WILL BE IMPAIRED OR DISRUPTED IN ANY MANNER ON ANY STREET, THE CONTRACTOR SHALL NOTIFY THE POLICE TRAFFIC SERGEANT AT 921-3610 AT LEAST 48 HOURS IN ADVANCE.
- C. Streets shall not be closed, except when and where directed by the ENGINEER, and whenever a street is not closed the work must be conducted with the provision for safe passageway for traffic at all times. The CONTRACTOR shall make all necessary arrangements concerning maintenance of traffic and selection of detours required.
- D. When permission has been granted to close an existing roadway, or portion thereof, the CONTRACTOR shall furnish and erect signs, barricades, lights, flags and other protective devices as necessary subject to the approval of the ENGINEER. From sunset to sunrise, the CONTRACTOR shall furnish and maintain as many yellow lights as the ENGINEER may direct.
- E. During working hours the CONTRACTOR shall furnish watchmen in sufficient numbers to protect and divert the vehicular and pedestrian traffic from working areas closed to traffic, or to protect any new work. Failure to comply with this requirement will result in the ENGINEER shutting down the work until the CONTRACTOR shall have provided the necessary protection.
- F. No separate payment will be made for such signs, barricades, lights, flags, watchmen or other protective devices as required, with all costs thereof deemed to be included in the prices bid for the various items scheduled in the bid.
- G. Sidewalks, gutters, drains, fire hydrants and private drives shall, in so far as practicable, be kept in condition for their intended uses. While the work is actually going on at any location, as much as half the street width at that location may be barricaded to exclude traffic entirely, but street traffic shall not be obstructed needlessly. Fire hydrants on or adjacent to the work shall be kept accessible to fire apparatus at all times, and no material or obstruction shall be placed within ten feet of any such hydrant.
- H. Construction material stored upon the public street shall be placed so as to cause as little obstruction to the general public as is reasonably possible.

7.11 Use of Explosives:

When the use of explosives is necessary for the prosecution of the work, the CONTRACTOR shall observe the utmost care so as not to endanger life or property, and whenever directed, the number and size of charges shall be limited. All explosives shall be stored in a secure manner and all such storage places shall be marked clearly "DANGEROUS EXPLOSIVES" and shall be in care of a competent watchman at all times. The CONTRACTOR must familiarize himself with all laws and ordinances pertaining thereto, and govern himself and his employees accordingly.

7.12 Loading of Structures:

The CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall the CONTRACTOR subject any part of the work or adjacent property to stresses or pressures that will endanger it.

7.13 Concerning Subcontractors:

- A. The CONTRACTOR, with his own forces, shall perform no less than 25% of the work as determined by the Contract price. Each Subcontractor shall be properly licensed for the type of work he is to perform.
- B. A copy of each Sub-Contract shall be filed promptly with the ENGINEER upon request. Each Sub-Contract shall contain a reference to the Contract between the CITY and the CONTRACTOR, and the terms and conditions of the Contract shall be made a part of each Sub-Contract. Each Sub-Contract shall provide for annulment of same by the CONTRACTOR upon written order of the ENGINEER if the Subcontractor fails to comply with the requirements of this Contract.
- C. The CONTRACTOR shall be responsible to the CITY and ENGINEER for the acts and omissions of his Sub-Contractors and their employees to the same extent as he is responsible for the acts and omissions of his own employees. Nothing contained in this Contract shall create any contractual relationship between any Subcontractor and the CITY or ENGINEER nor relieve the CONTRACTOR of any liability or obligation under this Contract.

7.14 Materials and Equipment:

- A. Material for the Work:
 - 1. The CONTRACTOR shall furnish all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water and sanitary facilities and all other facilities and incidentals necessary for the execution, testing, initial operation and completion of the work.
 - 2. Unless otherwise specified, shown or permitted by the ENGINEER, all material and equipment incorporated in the work shall be new and of current manufacture. The ENGINEER may request the CONTRACTOR to furnish manufacturer's certificates to this effect.

3. The ENGINEER may require any or all materials to be subjected to test by means of samples or otherwise, at production points or after delivery. The CONTRACTOR shall afford such facilities as the ENGINEER may require for collecting and forwarding samples, which samples shall be furnished by the CONTRACTOR without charge. The CONTRACTOR shall furnish evidence satisfactory to the ENGINEER that the materials and finished articles have passed the required test prior to the incorporation of such materials and finished articles in the work. Unless otherwise provided, the cost of such inspection and testing shall be as provided in Article 12.2.
4. All packaged manufactured products for use on the work shall be delivered to the work in their original, unopened packages, bearing thereon the manufacturer's name and the brand name of the product.
5. Wherever any product or material is selected to be used on the work, all such products or material shall be of the same brand and manufacture throughout the work.
6. All equipment, tools and machinery used for handling material or executing any part of the work shall be maintained in a satisfactory working condition. All equipment utilized on any portion of the work shall be such that no injury to personnel, the work, adjacent property or other objects will result from its use.
7. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable manufacturer, fabricator, supplier or distributor, except as otherwise provided in the Contract Documents.

B. Storage of Materials:

1. All materials and equipment including that ordered by the CITY designed for permanent installation in the work shall be properly stored by the CONTRACTOR to insure protection against deterioration of any type. These materials shall be placed as to cause a minimum of inconvenience to other contractors on the work and to the public. The storage piles shall be arranged to facilitate inspections, and any deterioration shall be grounds for rejection.
2. Materials stored in public Rights-of-Way, shall be stored in such a manner so as to be compatible with the Traffic Control requirements set forth in Paragraph 7.10. Materials shall be stored so as not to deny access to public or private property. Stored materials shall be adequately marked with barricades and/or flashing warning lights, where necessary, so as to protect the materials from damage and to protect the public health, safety and welfare.
3. Lawns, grass plots or other private property shall not be used for storage purposes without written permission of the Owner or Lessee of that private

property. Should the CONTRACTOR desire to store equipment or materials of any kind on the property of the CITY, he must obtain permission from the ENGINEER. The CITY reserves the right to order materials to be removed or relocated in such approved storage areas, if necessary.

4. The protection of stored materials shall be the CONTRACTOR's responsibility and the CITY OF HOLLYWOOD shall not be liable for any loss of materials, by theft or otherwise, nor for any damage to the stored materials.

C. **Salvage of Materials and Equipment:**

The CITY reserves the right to retain title to all soil, sand, stone, gravel, equipment, machinery or any other material that was a part of the structure, site or Right- of-Way and which was developed from excavations or other operations connected with the work. The CONTRACTOR will be permitted to use in the work, without charge, any such material which meets the requirements of the Contract Documents. For that material which the CITY desires to retain the CONTRACTOR shall, at his expense, transfer to a site within the CITY as designated by the ENGINEER. That material which the CITY does not wish to retain shall be the property of the CONTRACTOR and removed from the site at CONTRACTOR's expense.

7.15 Temporary Utilities:

The CONTRACTOR shall provide and maintain at his own expense, all water, power, telephone and sanitary facilities as required to comply with State and/or local Codes and Regulations. If water, including that for testing is required, it is the CONTRACTOR's responsibility to arrange through the CITY Water Department for a water meter. A deposit to be paid by the CONTRACTOR is required for meter rental and all water shall be purchased at the prevailing rate.

7.16 Review of Records:

The CONTRACTOR shall allow and permit the ENGINEER or his duly authorized representative to inspect and review all payrolls, records of personnel, conditions of employment, invoice of materials, books of accounts and other relevant data and records pertinent to the CONTRACT and Sub-Contracts.

7.17 Use of Premises:

CONTRACTOR shall confine construction equipment, the storage of materials and equipment and the operations of workmen to areas permitted by law, ordinances, permits or required by the Contract Documents, and shall not interfere with the premises or operation of the City Utilities facilities with construction equipment or other materials or equipment. Construction which interferes with Plant Operations shall be fully coordinated and approved by the ENGINEER.

7.18 CONTRACTOR's Daily Reports:

Except where otherwise provided, the CONTRACTOR shall complete a daily report indicating manpower, major equipment, Subcontractors, etc., involved in the performance of the work. The daily report shall be completed on forms approved by the ENGINEER, and shall be submitted to the ENGINEER at the conclusion of each work day.

7.19 Record Documents:

The CONTRACTOR shall keep one record copy of all Specifications, Drawings, Addenda, Modifications, Shop Drawings and samples at the site, in good order and annotated to show all changes made during the construction process. These shall be available to ENGINEER for examination and shall be delivered to ENGINEER upon completion of the work.

7.20 Cleanliness of the Site:

During the progress of the work, The CONTRACTOR shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the work. At the completion of the work the CONTRACTOR shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery and surplus materials, and shall leave the site clean and ready for occupancy by the CITY. The CONTRACTOR shall restore to their original condition those portions of the site not designated for alteration by the Contract Documents.

7.21 Dust Control:

It shall be the CONTRACTOR's responsibility to control dust by watering as directed by the ENGINEER. The water used shall be paid for by the CONTRACTOR. Should the CONTRACTOR fail to control dust to the satisfaction of the ENGINEER, the CITY will control the dust by whatever means the CITY desires and the CONTRACTOR shall pay all expenses incurred by the CITY associated with the control of the dust.

7.22 Continuing the Work:

The CONTRACTOR shall carry on the work and maintain the Progress Schedule during all disputes or disagreements with the CITY. No work shall be delayed or postponed pending resolution of any disputes or disagreements, except as the CONTRACTOR and the CITY may otherwise agree in writing.

7.23 Indemnification:

In consideration of the amount listed in the Bid Form and other valuable consideration, the Contractor shall defend, indemnify and save harmless the CITY, its officers, agents, and employees from or on account of any personal injury, loss of life or damage to property received or sustained by any person or persons during or on account of any operations connected with the construction of this Project; or by or in consequence of any negligence (excluding negligence of the CITY), in connection with the same; or by use of any improper materials or by or on account of any use of any improper materials or by or on account of any act or omission of the said Contractor or his subcontractor, agents, servants or employees. Contractor agrees to indemnify and save harmless the

CITY against any liability arising from or based upon the violation of any federal, state, county or city laws, by-laws, ordinances or regulations by the Contractor, his subcontractor, agents, servants or employees. Contractor further agrees to indemnify and save harmless the CITY from all such claims and fees, and from any and all suits and actions of every name and description that may be brought against the CITY on account of any claims, fees, royalties, or costs for any invention or patent, and from any and all suits and actions that may be brought against the CITY for the infringement of any and all patents or patent rights claimed by any person, firm, or corporation.

The indemnification provided above shall obligate the Contractor to defend at his own expense or to provide for such defense, at the CITY's option, any and all claims or liability and all suits and actions of every name and description that may be brought against the Owner which may result from the operations and activities under this Contract whether the construction operations be performed by the Contractor, his subcontractor or by anyone directly or indirectly employed by either.

Nothing in this indemnification shall be deemed to affect the rights, privileges or immunities of the CITY as set forth in Section 768.28, Florida Statutes.

The CITY will pay to the Contractor the specific consideration, in the amount stated in the Bid Form. The Contractor shall acknowledge the receipt of payment and other good and valuable consideration from the Owner which has been paid to him as specific consideration for the indemnification provided herein and in accordance with the provisions of Chapter F.S.A., Section 725.06.

ARTICLE 8 - CITY'S RESPONSIBILITIES

8.1 Communications:

The CITY shall issue all communications to the CONTRACTOR through the ENGINEER.

8.2 Furnish Contract Documents:

The CITY shall furnish the number of Contract Documents as specified in the Supplementary General Conditions to the CONTRACTOR at no cost. Referenced Standard Specifications Manuals, guidebooks, etc., will not be provided.

8.3 Furnish Right-of-Way:

The CITY shall furnish the necessary land or Right-of-Way on which the work is to be accomplished, and will provide lines and grades as specified in Article 6.

8.4 Timely Delivery of Materials:

The CITY shall be responsible for the delivery of any CITY furnished material, equipment or labor as specified in the Contract Documents.

ARTICLE 9 - ENGINEER'S STATUS

9.1 Authority of the Engineer:

- A. The general supervision of the execution of this Contract is vested in the ENGINEER who is the CITY's sole representative during the construction period. The instructions of the ENGINEER are to be strictly and promptly followed in every case. The CONTRACTOR's representative (Article 7.8 A. 1.) shall be responsible for the execution of any instructions given by the ENGINEER during the absence of the CONTRACTOR.
- B. The ENGINEER is the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the work. Claims, disputes and other matters relating to the acceptability of work or requirements of the Contract Documents shall be referred in writing to the ENGINEER within 15 days of the event, with a request for a formal decision, which the ENGINEER will render in writing within a reasonable time. This rendering of a decision by the ENGINEER will be a condition precedent to any exercise by the CITY or CONTRACTOR of rights or remedies as either may otherwise have under the Contract Documents or at law in respect to any such claim, dispute or other matter.
- C. The ENGINEER will issue with reasonable promptness any written clarifications or interpretations of the Contract Documents as he shall deem necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. If, as a result of a clarification or interpretation, either the CONTRACTOR or ENGINEER believes a Change Order is justified, it shall be submitted.
- D. The ENGINEER has approval authority over the acceptability of all material or equipment furnished, Shop Drawings, Change Orders, work performed and the rate of progress of the work. Verification of the quantities of work performed for pay purposes is the responsibility of the ENGINEER.
- E. The ENGINEER also has the authority to disapprove or reject work which is defective, and may require special inspection or testing of the work, whether or not it is fabricated, installed or completed.
- F. The ENGINEER has the authority to suspend the work wholly or in part for such period or periods as may be deemed necessary, due to the unsuitable prosecution of the work, or for such time as is necessary due to failure on the part of the CONTRACTOR to carry out orders given or perform any or all provisions of the Contract. The CONTRACTOR shall not suspend the work and shall not remove any equipment, tools, lumber or other materials without the written permission of the ENGINEER.

9.2 Access to the Work:

The ENGINEER is to have free access to the materials and work at all times for laying out, measuring or inspecting same, and the CONTRACTOR is to afford him all necessary facilities and assistance for so doing.

9.3 Limitations on The ENGINEER's Responsibilities:

- A. Neither the ENGINEER's authority to act under this Article or elsewhere in the Contract Documents nor any decision made by the ENGINEER in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of the ENGINEER to the CONTRACTOR, any Subcontractor, any manufacturer, fabricator, supplier or distributor or any of their agents or employees or any other person performing any of the work.
- B. Whenever in the Contract Documents the terms "as ordered", "as directed", "as required", "as allowed" or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper" or "satisfactory" or adjectives of like effect or import are used, to describe requirement, direction, review or judgment of the ENGINEER as to the work, it is intended that such requirement, direction, review or judgment will be solely to evaluate the work for compliance with the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective never indicates that the ENGINEER has authority to supervise or direct performance of the work.
- C. The ENGINEER will not be responsible for the CONTRACTOR's means, methods, techniques, sequences or procedures of construction, nor the safety precautions and programs incident thereto, and the ENGINEER will not be responsible for the CONTRACTOR's failure to perform the work in accordance with the Contract Documents.
- D. The ENGINEER will not be responsible for the acts or omissions of the CONTRACTOR or of any Subcontractors, or of the agents or employees of any CONTRACTOR or subcontractor, or of any other persons at the site or otherwise performing any of the work.

9.4 Inspectors:

- A. Inspectors employed by the CITY assist the ENGINEER in ascertaining the work conforms to the Contract Documents and are authorized to inspect all work done and material furnished as representatives of the ENGINEER. Inspectors shall be stationed at the site of the work to report to the ENGINEER as to the progress of the work and the quality of workmanship and material.
- B. In case of any dispute arising between the CONTRACTOR and the Inspector, the Inspector shall have the authority to reject material or to suspend the work until the question of issue can be referred to and decided upon by the ENGINEER.
- C. If the CONTRACTOR refuses to suspend operation on verbal order, the Inspector shall issue a written order giving the reason for shutting down the work.

After placing the order in the hands of the man in charge, the Inspector shall immediately leave the job. work done during the absence of the Inspector, after such written notice, will not be accepted nor paid for.

- D. Inspectors are not authorized to revoke, alter, enlarge, relax or release any requirements of these Contract Documents, nor to issue instructions contrary to them. Inspectors shall in no case act as foreman or perform other duties for the CONTRACTOR, nor interfere with management of the work by the latter. Any instructions which Inspectors may give the CONTRACTOR shall in no way be construed as releasing the CONTRACTOR from fulfillment of the terms of the Contract.
- E. The payment of any compensation, whatever may be its character or form, or the giving of any gratuity, or the granting of any valuable favor, by the CONTRACTOR to any Inspector, directly or indirectly, is strictly prohibited and any such act on the part of the CONTRACTOR will constitute a violation of this Contract and may subject the CONTRACTOR to other penalties provided for by law or ordinance.

9.5 Inspections:

- A. The ENGINEER will make, or have made, such inspections and tests as he deems necessary to assure that the work is being accomplished in accordance with the requirements of the Contract. In the event such Inspections or tests reveal non-compliance with the requirements of the Contract, the CONTRACTOR shall bear the cost of such corrective measures as well as the cost of subsequent reinspection and retesting.
- B. Work done in the absence of a prescribed inspection may be required to be removed and replaced under proper inspection. The entire cost of removal and replacement, including the cost of all material which may be furnished by the CITY and used in the work thus removed, shall be borne by the CONTRACTOR, regardless of whether the work removed is found to be defective or not. Work covered up without the authority of the ENGINEER, shall, upon order of the ENGINEER, be uncovered to the extent required, and the CONTRACTOR shall similarly bear the entire cost of performing all the work and furnishing all the material necessary for the removal of the covering and its subsequent replacement.
- C. Unless otherwise provided, the cost of inspection and all inspection fees imposed by public agencies other than the fees associated with the issuance of the Master Building Permit by the City of Hollywood shall be paid by the CONTRACTOR.
- D. No inspection nor any failure to inspect at any time or place shall relieve the CONTRACTOR from any obligation to perform all of the work in strict conformance with the requirements of the Contract Documents.

ARTICLE 10 - CHANGES IN THE WORK/CONTRACT PRICE

10.1 Changes in the Work or Terms of Contract Documents:

- A. Without invalidating the Contract and without notice to any surety CITY reserves and shall have the right, from time to time to make such increases, decreases or other changes in the character or quantity of the Work as may be considered necessary or desirable to complete fully and acceptably the proposed construction in a satisfactory manner. Any extra or additional work within the scope of this Project must be accomplished by means of appropriate Clarifications, Field Orders, or Change Orders.
- B. Any changes to the terms of the Contract Documents must be contained in a written document, executed by the parties hereto, with the same formality and of equal dignity prior to the initiation of any work reflecting such change.

This section shall not prohibit the issuance of Change Orders executed only by CITY as hereinafter provided.

10.2 Supplemental Instructions - Clarifications:

- A. The CITY, through the ENGINEER, shall have the right to approve and issue Clarifications setting forth written interpretations of the intent of the Contract Documents and ordering minor changes in Work execution, providing the Clarifications involve no change in the Contract Price or the Contract Time.
- B. The ENGINEER shall have the right to approve and issue Clarifications setting forth written orders, instructions, or interpretations concerning the Contract Documents or its performance, provided such Clarifications involve no change in the Contract Price or the Contract Time.

10.3 Field Orders / Change Orders:

- A. Changes in the quantity or character of the Work within the scope of the Project which are not properly the subject of Clarifications, including all changes resulting in changes in the Contract Price or the Contract Time, shall be authorized only by Field Orders or Change Orders approved in advance and issued in accordance with the provisions of the CITY Procurement Code, as amended from time to time.
- B. CONTRACTOR shall not start work on any changes requiring an increase in the Contract Price or the Contract Time until a Field Order or Change Order setting forth the adjustments is approved by the CITY. Upon receipt of a Change Order CONTRACTOR shall promptly proceed with the work set forth within the document.

- C. Field Orders shall be issued for change in Contract Price related to Cost Allowances specifically included on the Proposal Bid Form. Change Orders shall be issued when required for all other Contract Price Changes. Hereinafter, the term "Change Order(s)" shall be used to include "Change Orders" and "Field Orders" with the exception that Field Order shall not be used for any Contract Time adjustments.
- D. In the event satisfactory adjustment cannot be reached for any item requiring a change in the Contract Price or Contract Time, and a Change Order has not been issued, CITY reserves the right at its sole option to either terminate the Contract as it applies to the items in question and make such arrangements as may be deemed necessary to complete the disputed work; or the work shall be performed on the "cost of work" basis as described in Article 10.4.
- E. On approval of any Contract change increasing the Contract Price, CONTRACTOR shall ensure that the performance bond and payment bond are increased so that each reflects the total Contract Price as increased.
- F. Under circumstances determined necessary by CITY, Change Orders may be issued unilaterally by CITY.

10.4 Value of Change Order Work:

- A. The value of any work covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways:
 - A.1 Where the work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of items involved, subject to the provisions of Article 10.4.G.
 - A.2 By mutual acceptance of a lump sum which CONTRACTOR and CITY acknowledge contains a component for overhead and profit.
 - A.3 On the basis of the "cost of work," determined as provided in this Article, plus a CONTRACTOR's fee for overhead and profit which is determined as provided in Article 10.4.D.
- B. The term "cost of work" means the sum of all direct costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work described in the Change Order. Except as otherwise may be agreed to in writing by CITY, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items and shall not include any of the costs itemized in Article 10.4.C.
 - B.1 Payroll costs for employees in the direct employ of CONTRACTOR in the performance of the work described in the Change Order under schedules of job classifications agreed upon by CITY and

CONTRACTOR. Payroll costs for employees not employed full time on the work covered by the Change Order shall be apportioned on the basis of their time spent on the work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workers' or workmen's compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay application thereto. Such employees shall include superintendents and foremen at the site. The expenses of performing the work after regular working hours, on Sunday or legal holidays shall be included in the above to the extent authorized by CITY.

- B.2 Cost of all materials and equipment furnished and incorporated in the work, including costs of transportation and storage thereof, and manufacturers' field services required in connection therewith. All cash discounts shall accrue to CONTRACTOR unless CITY deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to CITY. All trade discounts, rebates and refunds, and all returns from sale of surplus materials and equipment shall accrue to CITY and CONTRACTOR shall make provisions so that they may be obtained. Rentals of all construction equipment and machinery and the parts thereof whether rented from CONTRACTOR or others in accordance with rental agreements approved by CITY with the advice of ENGINEER and the costs of transportation, loading, unloading, installation, dismantling and removal thereof, all in accordance with the terms of said agreements. The rental of any such equipment, machinery or parts shall cease when the use thereof is no longer necessary for the work.
- B.3 Payments made by CONTRACTOR to Subcontractors for work performed by Subcontractors, If required by CITY, CONTRACTOR shall obtain competitive bids from Subcontractors acceptable to CONTRACTOR and shall deliver such bids to CITY who will then determine, with the advice of ENGINEER, which bids will be accepted. If the Subcontract provides that the Subcontractor is to be paid on the basis of cost of the work plus a fee, the Subcontractor's cost of the work shall be determined in the same manner as CONTRACTOR'S cost of the work. All Subcontractors shall be subject to the other provisions of the Contract Documents insofar as applicable.
- B.4 Cost of special engineers, including, but not limited to, engineers, architects, testing laboratories, and surveyors employed for services specifically related to the performance of the work described in the Change Order.

- B.5 Supplemental costs including the following:
The proportion of necessary transportation, travel and subsistence expenses of CONTRACTOR's employees incurred in discharge of duties connected with the work except for local travel to and from the site of the work.

Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the site and hand tools not owned by the workmen, which are consumed in the performance of the work, and cost less market value of such items used but not consumed which remains the property of CONTRACTOR.

Sales, use, or similar taxes related to the work, and for which CONTRACTOR is liable, imposed by any governmental authority. Deposits lost for causes other than CONTRACTOR's negligence; royalty payments and fees for permits and licenses. The cost of utilities, fuel, and sanitary facilities at the site. Receipted minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the work. Cost of premiums for additional bonds and insurance required because of changes in the work.

- C. The term "cost of the work" shall not include any of the following:

- C.1 Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, lawyers, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in its principal or a branch office for general administration of the work and not specifically included in the agreed-upon schedule of job classifications referred to in this Article, all of which are to be considered administrative costs covered by CONTRACTOR's fee.
- C.2 Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the site.
- C.3 Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the work and charges against CONTRACTOR for delinquent payments.
- C.4 Cost of premiums for all Bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same, except for additional bonds and insurance required because of changes in the work.
- C.5 Costs due to the negligence or neglect of CONTRACTOR, any Subcontractors, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to,

the correction of defective work, disposal of materials or equipment wrongly supplied and making good any damage to property.

- C.6 Other overhead or general expense costs of any kind and the cost of any item not specifically and expressly included in this Section.
- D. CONTRACTOR's fee allowed to CONTRACTOR for overhead and profit shall be determined as follows:
 - D.1 A mutually acceptable fixed fee or if none can be agreed upon,
 - D.2 A fee based on the following percentages of the various portions of the cost of the work:

For costs incurred under Article 10.4.B.1, CONTRACTOR's fee shall not exceed ten percent (10%).

For costs incurred under Article 10.4.B.3 and B.4, CONTRACTOR's fee shall not exceed seven and one half percent (7.5%); and if a subcontract is on the basis of cost of the work plus a fee, the maximum allowable to the Subcontractor as a fee for overhead and profit shall not exceed ten percent (10%);

No fee shall be payable on the basis of costs itemized under Article 10.4.B.5 and Article 10.4.C.
- E. The amount of credit to be allowed by CONTRACTOR to CITY for any such change which results in a net decrease in cost, will be the amount of the actual net decrease. When both additions and credits are involved in anyone change, the combined overhead and profit shall be figured on the basis of the net increase, if any, however, CONTRACTOR shall not be entitled to claim lost profits for any Work not performed.
- F. Whenever the cost of any work is to be determined pursuant to Articles 10.4.B and 10.4.C, CONTRACTOR will submit in a form acceptable to CONSULTANT an itemized cost breakdown together with the supporting data.
- G. Where the quantity of any item of the Work that is covered by a unit price is increased or decreased by more than twenty percent (20%) from the quantity of such work indicated in the Contract Documents, an appropriate Change Order shall be issued to adjust the unit price, if warranted.
- H. Whenever a change in the Work is to be based on mutual acceptance of a lump sum, whether the amount is an addition, credit or no change-in-cost, CONTRACTOR shall submit an initial cost estimate acceptable to ENGINEER and CITY.
 - H.1 Breakdown shall list the quantities and unit prices for materials, labor, equipment and other items of cost.
 - H.2 Whenever a change involves CONTRACTOR and one or more Subcontractors and the change is an increase in the Contract Price,

overhead and profit percentage for CONTRACTOR and each Subcontractor shall be itemized separately.

- I. Each Change Order must state within the body of the Change Order whether it is based upon unit price, negotiated lump sum, or "cost of the work."

10.5 Notification and Claim for Change of Contract Price:

- A. Any claim for a change in the Contract Price shall be made by written notice by CONTRACTOR to the CITY and to ENGINEER within five (5) calendar days of the commencement of the event giving rise to the claim and stating the general nature and cause of the claim. Thereafter, within twenty (20) calendar days of the termination of the event giving rise to the claim, written notice of the extent of the claim with supporting information and documentation shall be provided unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim and such notice shall be accompanied by CONTRACTOR's written notarized statement that the adjustment claimed is the entire adjustment to which the CONTRACTOR has reason to believe it is entitled as a result of the occurrence of said event. All claims for changes in the Contract Price shall be in accordance with Articles 10.3 and 10.4 hereof, if CITY and CONTRACTOR cannot otherwise agree. **IT IS EXPRESSLY AND SPECIFICALLY AGREED THAT ANY AND ALL CLAIMS FOR CHANGES TO THE CONTRACT PRICE SHALL BE WAIVED IF NOT SUBMITTED IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF THIS SECTION.**

10.6 Notice of Change:

If notice of any change affecting the general scope of the work or change in the Contract Price is required by the provisions of any Bond to be given to the Surety, it will be CONTRACTOR's responsibility to so notify the Surety, and the amount of each applicable Bond shall be adjusted accordingly. The CONTRACTOR shall furnish proof of such adjustment to the CITY. Failure of the CONTRACTOR to obtain such approval from the Surety may be a basis for termination of this Contract by the CITY.

10.7 Records:

The CONTRACTOR's representative and the ENGINEER shall compare records of extra work done at the end of the day. Such records shall be made in duplicate upon a form provided for such purpose by the ENGINEER and shall be signed by both the Inspector and the CONTRACTOR's representative, one copy being submitted to the ENGINEER and the other being retained by the CONTRACTOR.

10.8 Cancelled Items and Payments Therefore:

The CITY COMMISSION shall have the right to cancel those portions of the Contract relating to the construction of any item provided therein. Such cancellation shall entitle the CONTRACTOR to payment in a fair and equitable amount covering all items of cost incurred by him prior to the date of cancellation or suspension of the work. The CONTRACTOR shall be allowed a profit percentage on the materials used and on construction work actually performed, at the same rates as provided for "Extra Work", but no allowance will be made for anticipated profits. Acceptable materials ordered by the CONTRACTOR or delivered on the work, prior to date of such cancellation or suspension, may be purchased from the CONTRACTOR by the CITY at actual cost and shall thereupon, become property of the CITY, or may be returned to the manufacturer for a reasonable restocking charge.

10.9 Full Payment:

The Compensation herein provided shall be received and accepted by the CONTRACTOR as payment in full for all extra work done or costs incurred in event of cancellation.

ARTICLE 11 - CHANGES IN THE CONTRACT TIME

11.1 Change Order:

The Contract Time may only be changed by a Change Order. A FULLY EXECUTED CHANGE ORDER MUST EXIST PRIOR TO EXTENSION OR SHORTENING OF THE CONTRACT TIME.

11.2 Notification and Claim for Change of Contract Time:

- A. Any claim for a change in the Contract Time shall be made by written notice by the CONTRACTOR to the CITY and to ENGINEER within five (5) calendar days of the commencement of the event giving rise to the claim and stating the general nature and cause of the claim. Thereafter within twenty (20) calendar days of the termination of the event giving rise to the claim, written notice of the extent of the claim with supporting information and documentation shall be provided unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim and such notice shall be accompanied by CONTRACTOR's written notarized statement that the adjustment claimed is the entire adjustment to which the CONTRACTOR has reason to believe it is entitled as a result of the occurrence of said event. All claims for changes in the Contract Time shall be determined in accordance with Articles 10.3 and 10.4 hereof, if CITY and CONTRACTOR cannot otherwise agree. **IT IS EXPRESSLY AND SPECIFICALLY AGREED THAT ANY AND ALL CLAIMS FOR CHANGES TO THE CONTRACT TIME SHALL BE WAIVED IF NOT SUBMITTED IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF THIS SECTION.**
- B. The Contract Time will be extended an amount equal to time lost on critical Work items due to delays beyond the control of and through no fault or negligence of CONTRACTOR if a claim is made thereafter as provided in Article 11.2. Such delays shall include, but not be limited to, acts or neglect by any separate contractor employed by CITY, fire, floods, labor disputes, epidemics, abnormal weather conditions or acts of God

11.3 Basis for Extension:

Extensions of time shall be considered and will be based solely upon the effect of delays to the work as a whole. Extensions of time shall not be granted for delays to the work, unless the CONTRACTOR can clearly demonstrate, through schedule analysis, that the delay to the work as a whole arose in accordance with Article 12.3 or Article 15.1, and that such delays did or will, in fact, delay the progress of work as a whole. Time extensions shall not be allowed for delays to parts of the work that are not on the critical path of the project schedule. Time extensions shall not be granted until all float or contingency time, at the time of the delay, available to absorb specific delays and associated impacts is used.

11.4 Change of Time Due to Contract Execution Problems:

Refer to Article 3.4 for a decrease in Contract Time when the CONTRACTOR fails to return the correctly executed Contract Documents within the time allowed.

11.5 Change of Time Due to Change Order Evaluation:

When evaluating a proposed Change Order, the ENGINEER shall have access to any available float or contingency time. Extension will only be considered in accordance with Article 11.3.

11.6 Change of Time and Inspection and Testing:

Neither observations by the ENGINEER, nor inspections, tests or approvals by others, passing or failing, will be cause for consideration of time extension.

11.7 Change of Time and Defective Work:

- A. If WORK is found to be defective, CONTRACTOR shall bear all remedial expenses including any additional costs experienced by CITY due to delays to others performing additional WORK. CONTRACTOR shall further bear the responsibility for maintaining schedule, and will be excluded from a time extension and the recovery of delay damages due to the uncovering.
- B. If the WORK is found to be defective per the Specifications, but the CITY chooses to accept it at its sole discretion, CONTRACTOR shall bear the responsibility for maintaining schedule, and will be excluded from a time extension and the recovery of delay damages due to the uncovering.

11.8 Liquidated Damages:

All time limits stated in the Contract Documents are of the essence. The provisions of this Article 11 shall not exclude recovery for damages by CITY as indicated in Section 3 of the Supplementary General Conditions.

ARTICLE 12 - WARRANTY AND GUARANTEE;
TEST AND INSPECTIONS;
CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

12.1 Warranty and Guarantee:

The CONTRACTOR warrants and guarantees to the CITY and the ENGINEER that all work will be in accordance with the Contract Documents and will not be defective. Prompt notice of all defects shall be given to the CONTRACTOR. All defective work, whether or not in place, may be rejected, corrected or accepted as provided in this Article.

12.2 Tests and Inspections:

- A. The CONTRACTOR shall give the ENGINEER and, when appropriate, the Building Department and other regulatory authorities which have jurisdiction over the work, timely notice of readiness of the work for all required inspections, tests or approvals.
- B. All inspections performed as a result of the issuance of the Master Building Permit shall be performed by the CITY. All costs associated with such inspections shall be paid by the CITY, EXCEPT THAT should said test or inspection fail to pass the CONTRACTOR shall pay all costs associated with the rework and the retesting.
- C. When any other regulatory authority, by virtue of its rules or regulations, requires specific tests or inspections, the CONTRACTOR shall assume full responsibility for and pay all costs in connection with said tests and inspections.
- D. The CONTRACTOR shall also be responsible for and shall pay all costs in connection with any inspection or testing required in connection with the ENGINEER's acceptance of a manufacturer, fabricator, supplier or distributor of materials or equipment proposed to be incorporated in the work, or of materials or equipment submitted for approval prior to ENGINEER's acceptance thereof for incorporation in the work and as otherwise specified in the Contract Documents.
- E. Neither observations by the ENGINEER nor inspections, tests or approvals by others shall relieve the CONTRACTOR from his obligations to perform the work in accordance with the Contract Documents.

12.3 Uncovering Work:

- A. If any work that is to be inspected, tested or approved is covered without written concurrence of the ENGINEER, it must, if requested, by the ENGINEER, be uncovered. Such uncovering and replacement shall be at the CONTRACTOR's expense.

- B. CONTRACTOR must contact all regulatory agencies issuing construction permits to make all necessary inspections. If CONTRACTOR fails to have the necessary inspections performed and such failure results in uncovering of work already performed, CONTRACTOR shall be responsible for all related time delays and monetary costs.
- C. If the ENGINEER considers it necessary or advisable that work previously covered with his permission or cognizance be observed, inspected or tested, the CONTRACTOR, at the ENGINEER's request, shall uncover, expose or otherwise make available for observation, inspection or testing as the ENGINEER may require, that portion of the work in question, furnishing all necessary labor, material and equipment. If it is found that such work is defective, the CONTRACTOR shall bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, including compensation for additional professional services. If, however, such work is not found to be defective the CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction if he makes a claim therefor in accordance with Article 10.2 and Article 11.2.

12.4 City May Stop the Work:

If the work is defective, or the CONTRACTOR fails to supply sufficient skilled workmen or suitable materials or equipment, the CITY may order the CONTRACTOR to stop the work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the CITY to stop the work shall not give rise to any duty on the part of the CITY to exercise this right for the benefit of the CONTRACTOR or any other party.

12.5 Correction or Removal of Defective Work:

If required by the ENGINEER, the CONTRACTOR shall promptly, without cost to the CITY and as specified by the ENGINEER either correct any defective work, whether or not fabricated, installed or completed, or if the work has been rejected by the ENGINEER, remove it from the site and replace it with nondefective work.

12.6 One Year Correction Period:

If within one year after the date of Substantial Completion or Final Completion as applicable, or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any work is found to be defective, the CONTRACTOR shall promptly without cost to the CITY and in accordance with the ENGINEER's written instructions, either correct such defective work, or if it has been rejected by the ENGINEER remove it from the site and replace it with nondefective work. If the CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, the ENGINEER may have the defective work corrected or the rejected work removed and replaced, and all direct and indirect costs of such removal and replacement, including compensation for additional professional services, shall be paid by the CONTRACTOR.

12.7 Acceptance of Defective Work:

If instead of requiring correction or removal and replacement of defective work, the ENGINEER prefers to accept it, he may do so. In such case, if acceptance occurs prior to the ENGINEER's recommendation of final payment, a Change Order shall be issued incorporating the necessary revisions in the Contract Documents, including appropriate reduction in the Contract Price; or if the acceptance occurs after such recommendation, an appropriate amount shall be paid by the CONTRACTOR to the CITY.

12.8 City May Correct Defective Work:

If the CONTRACTOR fails within a reasonable time after written notice of the ENGINEER to proceed to correct and to correct defective work or to remove and replace rejected work as required by the ENGINEER in accordance with Paragraph 12.5, or if the CONTRACTOR fails to perform the work in accordance with the Contract Documents, (including any requirements of the progress schedule), the CITY may, after seven days' written notice to the CONTRACTOR, correct and remedy any such deficiency. In exercising its rights under this Paragraph the CITY shall proceed expeditiously. To the extent necessary to complete corrective and remedial action, the CITY may exclude the CONTRACTOR from all or part of the site, take possession of all or part of the work, and suspend the CONTRACTOR's services related thereto, take possession of the CONTRACTOR's tools, appliances, construction equipment and machinery at the site and incorporate in the work all materials and equipment stored at the site or for which the CITY has paid the CONTRACTOR but which are stored elsewhere. The CONTRACTOR shall allow the CITY, the CITY's representatives, agents and employees such access to the site as may be necessary to enable the CITY to exercise his rights under this Paragraph. All direct and indirect costs of the CITY in exercising such rights shall be charged against the CONTRACTOR in an amount verified by the ENGINEER, and a Change Order shall be issued incorporating the necessary revisions in the Contract Documents and a reduction in the Contract Price. Such direct and indirect costs shall include, in particular but without limitations, compensation for additional professional services required and all costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of the CONTRACTOR's defective work. The CONTRACTOR shall not be allowed an extension of the Contract Time because of any delay in performance of the work attributable to the exercise by the CITY of the CITY's rights hereunder.

ARTICLE 13 - PAYMENTS TO THE CONTRACTOR

13.1 Basis of Payment:

Progress payments shall be based on the aggregate of the unit price amounts listed in the Proposal or in the Schedule of Values which have been incorporated in the work acceptable to the ENGINEER.

13.2 Unit Price Inclusion:

The unit prices stated in the Proposal include all costs and expenses for materials, labor, tools, equipment, transportation, commissions, patent fees and royalties, removing crossings or other obstructions, protection or maintaining pipes, drains, railroad tracks, buildings, bridges, or other structures furnishing temporary crossings or bridges, furnishing all supplemental construction stakes, batter boards, templates, common and ordinary labor for handling materials during inspection replacing any property damage, together with any and all costs or expenses for performing and completing the work as specified.

13.3 Schedule of Values: (Lump Sum Price Breakdown)

A Schedule of Values must be submitted within seven days subsequent to the CONTRACTOR executing and submitting the Documents required of Article 2.13 of the Section II – Special Terms and Conditions. The schedules shall be satisfactory in form and substance to the ENGINEER, and shall include quantity and unit prices aggregating the Contract Price, and shall subdivide the work into component parts in sufficient detail to serve as the basis for progress payments during construction. Upon acceptance of the schedule of values by the ENGINEER, it shall be incorporated into a form of Application for Payment acceptable to the ENGINEER.

13.4 Changed Conditions: (Unit Price Only)

It is mutually agreed that due to latent field conditions which can not be foreseen at the time of advertising for bids, adjustments of the Plans to field conditions will be necessary during construction; and, therefore, such changes in the plans shall be recognized as constituting a normal and accepted margin of adjustment not unusual and not involving or permitting any change or modification of unit prices, in which case payment will be made for the revised quantities at the unit price bid in the Proposal.

13.5 Application for Progress Payment:

On the 20th day of the month or the first working day thereafter, the CONTRACTOR shall submit to the ENGINEER for review an Application for Payment form filled out and signed by the CONTRACTOR. The form shall be notarized, and shall cover the work completed as of the date of the application. The Application for Payment shall be accompanied by a Schedule of Values, and any other supporting documentation as the ENGINEER may reasonably require.

13.6 Payment for Materials:

If payment is requested on the basis of materials and equipment not incorporated in the work but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Payment shall also be accompanied by such data, satisfactory to the ENGINEER, as will establish the CITY's title to the material and equipment and protect the CITY's interest therein, including applicable insurance.

13.7 Affidavit Required:

All Applications for Payment shall include an Affidavit of the CONTRACTOR stating that all previous progress payments received on account of the work have been applied to discharge in full all of CONTRACTOR's obligations reflected in prior Applications for Payment. The amount of retainage with respect to progress payments will be 5%.

13.8 Retainage:

The amount of retainage with respect to progress payments will be 5% until completion of the construction services purchased pursuant to the Contract, as more specifically set forth in the Article 3 of the main contract entitled "Partial and Final Payment".

13.9 CONTRACTOR's Warranty of Title:

The CONTRACTOR warrants and guarantees that title to all work, materials and equipment covered by any Application for Payment whether incorporated in the Project or not, will pass to the CITY at the time of payment free and clear of all liens, claims, security interests and encumbrances (hereinafter in these General Conditions referred to as "Liens").

13.10 Review of Application for Payment:

The ENGINEER will, within seven (7) days, review the Application for Payment and either approve and submit it for payment or notify the CONTRACTOR of the deficiencies such that the CONTRACTOR may make the necessary corrections and resubmit in time for the month's payment. However, the ENGINEER may refuse to recommend the whole or any part of any payment if, in his opinion, it would be incorrect to make such representations. He may also refuse to recommend any such payment, or because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended to such extent as may be necessary in the ENGINEER's opinion to protect the CITY from loss because:

- A. The work is defective, or completed work has been damaged requiring correction or replacement.
- B. Written claims have been made against the CITY or Liens have been filed in connection with the work.
- C. The Contract Price has been reduced because of Change Order.
- D. The CITY has been required to correct defective work or complete the work in accordance with Article 12.8.
- E. The CONTRACTOR's unsatisfactory prosecution of the work in accordance with the Contract Documents.
- F. The CONTRACTOR's failure to make payment to Sub- Contractors, or for labor, materials or equipment.

13.11 Payment to the Contractor:

Payments are made only on the fifteenth day or first workday thereafter of each month.

**ARTICLE 14 - SUBSTANTIAL COMPLETION, PARTIAL UTILIZATION,
FINAL CLEAN UP, INSPECTION, PAYMENT AND ACCEPTANCE**

14.1 Substantial Completion:

When the CONTRACTOR considers the entire work ready for its intended use, the CONTRACTOR shall, in writing to the ENGINEER, certify that the entire work is substantially complete and request that the ENGINEER issue a Certificate of Substantial Completion. Within a reasonable time thereafter the CONTRACTOR and the ENGINEER shall make an inspection of the work to determine the status of completion. If the ENGINEER does not consider the work substantially complete, the ENGINEER will notify the CONTRACTOR in writing giving his reasons therefor. If the ENGINEER considers the work substantially complete, the ENGINEER will prepare and deliver to the CONTRACTOR a Certificate of Substantial Completion, which shall fix the date of Substantial Completion. There shall be attached to the certificate a proposed Punch List, developed by the CONTRACTOR, of items to be completed or corrected before final payment.

Within ten (10) days after delivery of the certificate, the CITY shall review the proposed Punch List and either approve it or contact the CONTRACTOR to commence good faith efforts to develop a Punch List that is satisfactory to both parties. If the parties are unable to resolve any differences they may have in the development of the Punch List, the ENGINEER shall resolve their differences. The parties shall expedite the process of developing the Punch List with the intent of finalizing the Punch List within sixty (60) days after the date of Substantial Completion.

At the time of delivery of the Certificate of Substantial Completion the ENGINEER will deliver to the CONTRACTOR written notice as to division of responsibilities pending final payment between the CITY and the CONTRACTOR with respect to security, operation, safety, maintenance, heat, utilities and insurance, said responsibilities will be binding on the CITY and the CONTRACTOR until final payment. Unless otherwise stated herein or on the Certificate of Substantial Completion, all building, product, equipment, and machinery warranties will commence on the date of Substantial Completion. The CITY shall have the right to exclude the CONTRACTOR from the work after the date of Substantial Completion, but the CITY shall allow the CONTRACTOR reasonable access to complete or correct items on the Punch List.

14.2 Partial Utilization:

Use by the CITY of any finished part of the work which has specifically been identified in the Contract Documents or which the ENGINEER and the CONTRACTOR agree constitutes a separately functioning and usable part of the work that can be used by the CITY without significant interference with CONTRACTOR's performance of the remainder of the work, may be accomplished prior to Substantial Completion of all the work subject to the following:

- A. The ENGINEER at any time may request the CONTRACTOR in writing to permit the CITY to use any such part of the work which the ENGINEER believes to be ready for its intended use and substantially complete. If the CONTRACTOR agrees, the CONTRACTOR will certify to the ENGINEER that said part of the work is substantially complete and request the ENGINEER to issue a Certificate of Substantial Completion for that part of the work. The CONTRACTOR, at any time, may notify the ENGINEER in writing that the CONTRACTOR considers any such part of the work ready for its intended use and substantially complete and request the ENGINEER to issue a Certificate of Substantial Complete for the part of the work. Within a reasonable time after either such request, the CONTRACTOR and the ENGINEER shall make an inspection of that part of the work to determine its status of completion. If the ENGINEER does not consider that part of the work to be substantially complete, the ENGINEER will notify the CONTRACTOR in writing giving the reasons therefore. If the ENGINEER considers that part of the work to be substantially complete, the provisions of Article 14.1 will apply with respect to Certificate of Substantial Completion of that part of the work and the division of responsibility in respect thereof and access thereto. It shall be understood by the CONTRACTOR that until such written notification is issued, all responsibility for care and maintenance of all of the WORK shall be borne by the CONTRACTOR. Upon issuance of said written notice of partial utilization, the OWNER will accept responsibility for the protection and maintenance of all such items or portions of the WORK described in the written notice.

14.3 Final Clean-Up:

Upon completion of the work and before final inspection shall be made, the CONTRACTOR shall clean and remove from the site, the Right-of-Way and adjacent property, all surplus and discarded materials, rubbish, and temporary structures; restore in an acceptable manner all property, both public and private, which has been damaged during the prosecution of the work; and shall leave the site and vicinity unobstructed in a neat and presentable condition throughout the entire area or length of the work under Contract. The placing of materials of every character, rubbish, or equipment on the abutting property, with or without the consent of the property owners, shall not constitute the satisfactory disposal. If the work is of such a character as may be done by block or sections, the CONTRACTOR may be required to promptly remove and dispose of accumulated rubbish, debris or surplus materials from blocks or sections as completed or partially completed. No separate payment will be made for final cleaning up and restoration of property, but all costs thereof shall be included in the prices bid for the various scheduled items of work.

14.4 Final Inspection:

Upon written notice from the CONTRACTOR that the entire work or an agreed portion thereof is complete and final clean-up has been completed, the ENGINEER will make a final inspection with the CONTRACTOR and will notify the CONTRACTOR in writing of all particulars in which this inspection reveals that the work is incomplete or defective. The CONTRACTOR shall immediately take such measures as are necessary to remedy such deficiencies.

14.5 Final Application for Payment:

After the CONTRACTOR has completed all such corrections to the satisfaction of the ENGINEER and delivered all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, marked-up record documents (as provided in Article 7.19 of the General Conditions and other documents; all as required by the Contract Documents and after the ENGINEER has indicated that the work is acceptable (subject to the provisions of Article 14.9) the CONTRACTOR may make Application for Final Payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all documentation called for in the Contract Documents, together with complete and legally effective releases or waivers (satisfactory to the CITY) of all Liens arising out of or filed in connection with the work. In lieu thereof and as approved by the CITY, the CONTRACTOR may furnish receipts or releases in full; an affidavit of the CONTRACTOR that the releases and receipts include all labor, services, material and equipment for which a Lien could be filed, and that all payrolls, material and equipment bills, and other indebtedness connected with the work for which the CITY or the CITY's property might in any way be responsible, have been paid or otherwise satisfied; and consent of the Surety, if any, to final payment. If any Subcontractor or Supplier fails to furnish a release or receipt in full, the CONTRACTOR may furnish a Bond or other collateral satisfactory to the CITY to indemnify the CITY against any Lien.

14.6 Final Payment and Acceptance:

If on the basis of the ENGINEER's observation of the work during construction and final inspection, and the ENGINEER's review of the final Application for Payment and accompanying documentation, all as required by the Contract Documents, the ENGINEER is satisfied that the work has been completed and the CONTRACTOR's other obligations under the Contract Documents have been fulfilled, the ENGINEER will recommend payment. Thereupon the ENGINEER will give written notice to the CITY and the CONTRACTOR that the work is acceptable subject to the provisions of Article 14.9.

14.7 Payment of Retainage Without Final Completion:

If through no fault of the CONTRACTOR, final completion of the work is significantly delayed and if the ENGINEER so confirms, the CITY shall, upon receipt of the CONTRACTOR's final Application for Payment and recommendation of the ENGINEER, and without terminating the Agreement, make payment of the balance due for the portion of the work fully completed and accepted. If the remaining balance to be held by the CITY for work not fully completed or corrected is less than the retainage stipulated in the Agreement and if Bonds have been furnished as required in Article 5.2, the written consent of the Surety to the payment of the balance due for that portion of the work fully completed and accepted shall be submitted by the CONTRACTOR to the ENGINEER with the application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

14.8 CONTRACTOR's Continuing Obligation:

The CONTRACTOR's obligation to perform and complete the work in accordance with the Contract Documents shall be absolute. Neither recommendation of any progress or final payment by the ENGINEER, nor the issuance of a Certificate of Substantial Completion, nor any payment by the CITY to the CONTRACTOR under the Contract Documents, nor any use or occupancy of the work or any part thereof by the CITY nor any act of acceptance by the CITY nor any failure to do so, nor any review and approval of a Shop Drawing or sample submission, nor the issuance of a notice of acceptability by the ENGINEER pursuant to Article 14.6, nor any correction of defective work by the CITY will constitute an acceptance of work not in accordance with the Contract Documents or a release of the CONTRACTOR's obligation to perform the work in accordance with the Contract Documents (except as provided in Article 14.9).

14.9 Waiver of Claims:

The making and acceptance of final payment will constitute:

- A. A waiver of all claims by the CITY against the CONTRACTOR, except claims arising from unsettled Liens, from defective work appearing after final inspection pursuant to Article 14.4 or from failure to comply with the Contract Documents or the terms of any special guarantees specified therein; however, it will not constitute a waiver by the CITY of any rights in respect of the CONTRACTOR's continuing obligations under the Contract Documents.
- B. A waiver of all claims by the CONTRACTOR against the CITY other than those previously made in writing and still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.1 City May Suspend Work:

The CITY may, at any time and without cause, suspend the work or any portion thereof for a period of not more than ninety (90) days by notice in writing to the CONTRACTOR which will fix the date on which work will be resumed. The CONTRACTOR shall resume the work on the date so fixed. The CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension.

15.2 City May Terminate:

- A. Upon the occurrence of any one or more of the following events:
1. If the CONTRACTOR commences a voluntary case under any chapter of the Bankruptcy Code (Title 11, United States Code), as now or hereafter in effect, or if the CONTRACTOR takes any equivalent or similar action by filing a petition or otherwise under any other federal or state law in effect at such time relating to the bankruptcy or insolvency.
 2. If a petition is filed against the CONTRACTOR under any chapter of the Bankruptcy Code as now or hereafter in effect at the time of filing, or if a petition is filed seeking any such equivalent or similar relief against the CONTRACTOR under any other federal or state law in effect at the time relating to bankruptcy or insolvency.
 3. If the CONTRACTOR makes a general assignment for the benefit of creditors.
 4. If a trustee, receiver, custodian or agent of the CONTRACTOR is appointed under applicable law or under contract, whose appointment or authority to take charge of property of the CONTRACTOR is for the purpose of enforcing a Lien against such property or for the purpose of general administration of such property for the benefit of the CONTRACTOR's creditors.
 5. If the CONTRACTOR admits in writing an inability to pay its debts generally as they become due.
 6. If the CONTRACTOR persistently fails to perform the work in accordance with the Contract Documents (including, but not limited to, failure to supply a qualified superintendent or sufficient skilled workers or suitable materials or equipment or failure to adhere to the approved progress schedule revised from time to time).
 7. If the CONTRACTOR disregards laws or regulations of any public body having jurisdiction.

8. If the CONTRACTOR disregards the authority of the ENGINEER.
 9. If the CONTRACTOR otherwise violates in any substantial way any provisions of the Contract Documents.
- B. The CITY may, after giving the CONTRACTOR and the Surety seven days' written notice and to the extent permitted by laws and regulations, terminate the services of the CONTRACTOR, exclude the CONTRACTOR from the site and take possession of the work and of all the CONTRACTOR's tools, appliances, construction equipment and machinery at the site and use the same to the full extent they could be used by the CONTRACTOR (without liability to the CONTRACTOR for trespass or conversion), incorporate in the work all materials and equipment stored at the site or for which the CITY has paid the CONTRACTOR but which are stored elsewhere, and finish the work as the CITY may deem expedient. In such case the CONTRACTOR shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the Contract Price exceeds the direct, indirect and consequential costs of completing the work (including but not limited to fees and charges of engineers, architects, attorneys and other professionals, and court and arbitration costs) such excess will be paid to the CONTRACTOR. If such costs exceed such unpaid balance, the CONTRACTOR, or CONTRACTOR's Surety, shall pay the difference to the CITY.
 - C. Where the CONTRACTOR's services have been so terminated by the CITY, the CITY alone shall determine the scope and description of the work to be completed and the method and schedule for completing it.
 - D. Where the CONTRACTOR's services have been so terminated by the CITY the termination will not affect any rights or remedies of the CITY against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due the CONTRACTOR by the CITY will not release the CONTRACTOR from liability.
 - E. Upon seven days' written notice to the CONTRACTOR the CITY may, without cause and without prejudice to any other right or remedy, elect to abandon the work and terminate the Contract. In such case the CONTRACTOR shall be paid for all work executed and any expense sustained plus reasonable termination expenses, which will include, but not be limited to, direct, indirect and consequential costs (including, but not limited to, fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs).

15.3 Contractor May Stop Work or Terminate:

If through no act or fault of the CONTRACTOR, the work is suspended for a period of more than ninety (90) days by the CITY or under an order of court or other public authority, or the CITY fails for sixty (60) days to pay the CONTRACTOR any sum finally determined to be due, then the CONTRACTOR may, upon seven days' written notice to the CITY terminate the Contract and recover from the CITY payment for all work executed and any expense sustained plus reasonable termination expenses. In addition and in lieu of terminating the Contract, if the CITY has failed to make any payment as aforesaid, the CONTRACTOR may upon seven days' written notice to the CITY stop the work until payment of all amounts then due are paid. The provisions of this paragraph shall not relieve the CONTRACTOR of the obligations to carry on the work in accordance with the progress schedule and without delay during disputes and disagreements with the CITY.

- END OF SECTION -

ATTACHMENT C
SUPPLEMENTARY GENERAL CONDITIONS
INDEX TO ARTICLES

1. Project Schedule	00800-2
2. Insurance Requirements (Not Used)	00800-3
3. Liquidated Damages	00800-4
4. Restricted Area	00800-5
5. Existing Facilities and Structures	00800-5
6. Explosives	00800-5
7. Contract Documents	00800-5
8. Required Notifications	00800-5
9. Notice of Completion	00800-5
10. Prevailing Wage Requirement	00800-5
11. Inspections and Testing During Overtime	00800-6
12. Retainage	00800-6
13. Owner's Contingency (Not Used)	00800-8

General Note:

The General Conditions refer to specific section numbers in the Supplementary General Conditions. These reference numbers may not coordinate with the actual Article numbers utilized in the Supplementary General Conditions. The CONTRACTOR shall comply with all General Conditions and all Supplementary General Conditions as well as related conditions included in the General Requirements, Division 1 of the Technical Specifications. Incorrect cross-reference numbers shall not relieve this requirement.

1. Project Schedule

Time is of the essence for this work. The following defines the schedule for the project:

**CONSTRUCTION WORK SCHEDULE
CONSTRUCTION / STARTUP / ACCEPTANCE:**

	Completion Time (Calendar Days)
Substantial Completion	615
Project Closeout (Final Completion)	645

Failure to meet any of the above defined construction/startup/acceptance completion dates shall subject the CONTRACTOR to pay damages as specified in these Supplementary General Conditions in Article 3.

Substantial Completion

1. Refer to Attachment B - General Conditions Articles 14.1 and 14.2. (Certification of Substantial Completion Services appended to the Supplementary General Conditions).
2. Substantial Completion shall also include:
 - Completion of all construction work associated with the specific "Major Milestone" listed in the construction work schedule including completion of punch list items. "Completion of punch list items" shall be as determined by the Engineer in the field.
 - Coating touchup completed.
 - Record shop drawings and O&M submittals received and accepted by the Engineer.
 - Record drawing red-lines received and accepted by the Engineer.
 - Guarantee certifications, performance affidavits, and all other certifications received and accepted by the Engineer.

Contractor shall also conform to construction sequence constraints as defined on the Drawings and in Specifications.

2. **Insurance Requirements (Not Used. Refer to ARTICLE 2.25 of SECTION II – SPECIAL TERMS AND CONDITIONS OF THE CONTRACT DOCUMENTS**

3. **Liquidated Damages**

Liquidated damages shall be paid by the CONTRACTOR to the CITY for failure to complete work on time in accordance with the following schedule:

Service Lines Completed	Completion Time	Liquidated Damages (Per Day)
Substantial Completion	615	\$500.00
Project Closeout (Final Completion)	645	\$500.00

The CITY is hereby authorized to deduct the sums described above from the monies which may be due to the CONTRACTOR for the work under this contract. Liquidated damages shall be additive such that the maximum total which may be deducted shall be \$500.00/day. Other damages for failure to meet warranty conditions as defined in other sections of the Specifications shall also be added with liquidated damages for failure to meet completion times.

4. **Restricted Area**

The CONTRACTOR shall, in installing the new facilities, confine all activities within the CITY property, easement, and right-of-ways indicated.

5. **Existing Facilities and Structures**

All existing facilities shall be protected, and if damaged, shall be repaired by the CONTRACTOR at no additional cost to the CITY.

6. **Explosives**

Explosives shall not be used on this project.

7. **Contract Documents**

The CITY will provide the CONTRACTOR with one (1) set of Contract Documents after the Notice to Proceed.

8. **Required Notifications**

When provisions of the pertinent codes, standards or regulations conflict with this Specification, the more stringent shall apply.

Prior to any site work, the CONTRACTOR shall notify the Engineering and Construction Services Division Inspector at (954) 921-3930.

Prior to excavation at the site, the CONTRACTOR shall notify the appropriate utilities and Sunshine State One-Call of Florida, Inc. (formerly U.N.C.L.E.) at 1-800-432-4770 for locations of buried utilities.

Prior to closure of any CITY streets or alleyways, or other activity which requires the diversion of traffic, the CONTRACTOR shall notify and obtain the permission of the CITY of Hollywood Fire and Police Communications Section at (954) 967-4321.

9. Notice of Completion

See attached form.

10. Prevailing Wage Requirement

- A. The CONTRACTOR shall be responsible for ensuring payment of the rate of wages and fringe benefits, or cash equivalent, for all laborers, mechanics and apprentices employed by him/her or his/her SUBCONTRACTORS on the work covered by this contract which shall be not less than the prevailing rate of wages and fringe benefits payment or cash equivalent for similar skills or classifications of work as established by the General Wage Decision by the United States Department of Labor for Broward County, Florida that is in effect prior to the date the CITY issued the invitation for bids for this project (the prevailing rate of wages and fringes can be obtained at website <http://www.access.gpo.gov/davisbacon>).

If the General Wage Decision fails to provide for a fringe benefit rate for any worker classification, then the fringe benefit rate applicable to such worker classification shall be the fringe benefit rate that has a basic wage rate closest in dollar amount to the work classification for which no fringe benefit rate has been provided.

- B. Upon commencement of work, the CONTRACTOR and all of his/her SUBCONTRACTORS shall post a notice in a prominent place at the work site stating the requirements of this Article.
- C. As per the City of Hollywood Code of Ordinances, Prevailing Wage Requirements and Fringe Benefits are applicable to the following: (A) Utilities projects over \$1,000,000.00 (one million dollars) and (B) All other projects over \$500,000.00 (five hundred thousand dollars).

11. Inspections and Testing During Overtime

- A. The following supplement Article 3.15 and 3.16 of the General Conditions:

For weekend work, CONTRACTOR shall submit a written request to the CITY by the preceding Wednesday. A separate request is required for each week that the CONTRACTOR wished to work on a weekend. For evening and holiday work, CONTRACTOR shall submit a written request to the CITY three (3) days in advance. The CITY will provide inspection services for all overtime work and the CONTRACTOR shall pay for inspection services per Article 3.15, no exceptions.

Similarly, Holiday and other overtime work shall be requested a minimum of 36-hours in advance and CITY will provide inspection for all overtime.

- B. Exceptions to the hours and days of the week for work and other related limitations are allowed only for tie-ins during low flow periods / early morning hours, coatings that need to be applied during lower temperature times of the day and whenever the Documents specifically define that work shall be completed outside of the limitations for “normal” work hours, days, etc.

Inspection for tie-ins during low flow/early morning and specialty coating application performed during nighttime will not be cause for extra inspection costs unless such work is remedial in nature as a result of defective work.

12. Retainage

After Substantial Completion of the construction services purchased pursuant to this contract, CONTRACTOR may present to CITY a payment request for one-half of the retainage then held by CITY. CITY shall promptly make payment to CONTRACTOR, unless CITY has grounds for withholding the payment of retainage. CITY shall have grounds for withholding the payment of retainage with respect to any amounts that are the subject of a good-faith dispute, the subject of a claim brought pursuant to Florida Statute Section 255.05, or otherwise the subject of a claim or demand by CITY or CONTRACTOR.

At acceptance of Substantial Completion, CITY shall promptly make payment to CONTRACTOR of one-half of the retainage then held by CITY. At acceptance of completion of all punch list items, CITY shall promptly make payment to CONTRACTOR the balance of retainage then held by CITY.

13. Owner’s Contingency (NOT USED)

This allowance is in its entirety dedicated for the use of the Owner (The City of Hollywood) to address conditions (or work) associated with undefined conditions. All work resulting from undefined conditions shall be authorized in writing and in advance by the Owner, specifically the Director of Public Services, through the full execution of a Field Order. The actual amount to be paid per Field Order will be negotiated and agreed by both parties (the Owner and the Contractor). The final/negotiated amount of the field order will be deducted from the Owner’s Allowance designated in the Bid Proposal and Schedule of Values. The Owner reserves the right to award none, any portion of, or all of the money associated with this allowance. By executing the CONTRACT between the City of Hollywood and the Contractor, the Contractor acknowledges that under no circumstances he or she should assume that he or she would be entitled to any amounts set aside by the City of Hollywood within the Owner’s Allowance.

CERTIFICATE OF SUBSTANTIAL COMPLETION

PROJECT: **ENGINEER:** Engineering & Const. Services Division

TO: **CONTRACTOR:**

CONTRACT FOR:

NOTICE TO PROCEED DATE:

DATE OF ISSUANCE:

PROJECT OR DESIGNATED PORTION SHALL INCLUDE:

Portions of the work performed under this Contract as described above, have been reviewed and found to be substantially complete. The Date of Substantial Completion of Project or designated portion thereof designated above is hereby established as _____ which is also the date of commencement of applicable warranties required by the Contract Documents for the noted area.

DEFINITION OF DATE OF SUBSTANTIAL COMPLETION

The Date of Substantial Completion of the work or designated portion thereof is the date certified by the ENGINEER ("Date of Issuance" above) when construction is sufficiently complete, in accordance with the Contract Documents, so the CITY can occupy or utilize the work or designated portion thereof for the use for which it is intended, as expressed in the Contract Documents.

A list of items to be completed or corrected, prepared by the CONTRACTOR and verified and amended by the ENGINEER, for the above referenced "Project or Designated Portion" is attached to this form (attached "Punch List" dated _____).

The failure to include any items on such list does not alter the responsibility of the CONTRACTOR to complete all work in accordance with the Contract Documents.

CERTIFICATE OF SUBSTANTIAL COMPLETION

Please note that in accordance with Article 14 General Conditions, the Contractor retains full responsibility for the satisfactory completion of all work regardless of whether the Owner occupies and / or operates a part of the facility and that the taking possession and use of such work shall not be deemed an acceptance of any work not completed in accordance with the Contract Documents.

City of Hollywood - ECSD

ENGINEER

BY

DATE

CONTRACTOR

BY

DATE

The CITY OF HOLLYWOOD, through the City's authorized representative, accepts the work or designated portion thereof as substantially complete and will assume full possession thereof at _____(time) on _____
_____ (date).

BY

DATE

- END OF SECTION -

**TECHNICAL SPECIFICATIONS
100% SUBMITTAL**

CITY OF HOLLYWOOD

**Replacement of Nanofiltration
Process Pressure Vessels and Membrane Elements**

APRIL 2024



**City of Hollywood
3441 Hollywood Boulevard
Hollywood, Florida 33021**

**Brown and Caldwell
1580 Sawgrass Corporate Parkway, Suite 400
Sunrise, Florida 33323
Phone: (954) 200-7615**

**McCafferty Brinson Consulting, LLC
Phone: (954) 797-7100
Florida License No. 26952**

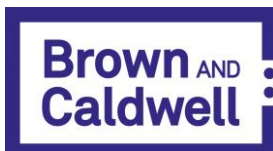


Table of Contents

Division 1 – General Requirements

01 10 00	Summary of Work
01 10 11	Temporary Environmental Controls
01 20 00	Project Meetings
01 25 00	Basis of Payment
01 33 00	Submittals
01 40 00	Testing and Inspection
01 41 00	Contractor's Health and Safety Plan
01 45 00	Contractor Quality Control
01 52 00	Maintenance of Facilities and Sequence of Construction
01 53 00	Protection of Existing Facilities
01 70 00	Project Closeout
01 73 24	Design Requirements for Non-Structural Components and Non-Building Structures
01 77 50	Warranties and Bonds
01 77 55	Membrane System Performance Warranty
01 78 23	Operation and Maintenance Data
01 79 00	Demonstration and Training
01 91 00	Commissioning
01 99 90	Reference Forms

Divisions 2 through 45 – Not Used

Division 46 – Water and Wastewater Equipment

46 63 11	Membrane Elements and MEM's Services
46 63 23	Membrane System Equipment and Installation

Divisions 47 through 16 – Not Used

End of Bidding Documents

The following Technical Data is bound into this document following the Bidding Documents for the Bidder's convenience.

1. Selected record drawings from the City of Hollywood Water Treatment Plant Upgrade Phase I, Metcalf & Eddy, December 8, 1995.
2. Photographs of typical existing NF unit.

SECTION 01 10 00
SUMMARY OF WORK

PART 1 - GENERAL

1.01 THE REQUIREMENT

- A. The work to be performed under this Contract shall consist of furnishing all tools, equipment, materials, supplies, and manufactured articles and for furnishing all transportation and services, including fuel, power, water, and essential communications, and for the performance of all labor, work, or other operations required for the fulfillment of the Contract in strict accordance with the Contract Documents. The work shall be complete, and all work, materials, and services not expressly shown or called for in the Contract documents which may be necessary for the complete and proper construction of the work in good faith shall be performed, furnished, and installed by the CONTRACTOR as though originally so specified or shown, at no increase in cost to the CITY.

- B. Prior to construction, the CONTRACTOR shall verify existing utilities identified on the Drawings and locate other potential utilities in their working area may not shown on the Drawings. The utility verifications, if applicable, consist of excavation to verify tie-in points and to locate potential conflicts that may affect the work as shown on the Contract Drawings. The CONTRACTOR shall be responsible for the coordination of this work with the associated utility owners and permitting agencies having jurisdiction over the specific locations to be verified.

1.02 SCOPE

- A. It is the intent of the CITY to obtain a complete and working installation under this contract and any items of labor, materials or equipment, which may reasonably be assumed as necessary to accomplish this end, should be supplied whether or not specifically shown on the plans or described herein. The following components comprise the major project elements:
 - 1. General Requirements of the Contract, including mobilization/demobilization, bonds, insurance, contract administration, scheduling and coordination, preparation and approval of submittals, provision of Operation and Maintenance (O&M) data, OWNER training, and specified testing and warranty services.
 - 2. Furnishing and installation of replacement membrane pressure vessels for the City's seven 2.0 million gallon per day (mgd) NF units. Each NF unit has three stages in a 32:16:6 array (54 pressure vessels per unit, or 378 pressure vessels total).
 - 3. Furnishing and installation of replacement nanofiltration membrane elements for the City's seven NF units. Each pressure vessel houses seven NF elements except for the six third-stage vessels which contain two spacers each. Each NF unit has 366 elements, or 2,562 total elements for the seven units. 21 additional elements shall also be furnished to the City for future pilot testing (2,583 elements total).
 - 4. Removal and disposal of the existing pressure vessels and membrane elements. The existing pressure vessels, membrane elements, and old accessories being replaced shall become the property of the CONTRACTOR upon removal from the membrane

units, and shall be removed from the site and disposed of at the CONTRACTOR's expense.

5. Disinfecting and bacteriologically clearing through the Florida Department of Environmental Protection (FDEP) the membrane units and preparation for loading of the new membrane elements. The Engineer will be responsible for preparation and submittal of the necessary documentation for bacteriological clearance. The CONTRACTOR is responsible for proper disinfection and for achieving clear bacteriological sample results.
 6. Loading of new membrane elements in the membrane element pressure vessels.
 7. Supplying and installing specified parts that require replacement during the unloading/loading process.
 8. Start-up and leak testing of the membrane units upon completion of loading.
 9. Correcting any defects associated with the membrane element installation.
 10. Completion of a seven-day membrane performance test for each of the membrane units.
 11. Completion of specified membrane system training, O&M Manuals, and all punchlist work.
 12. During the course of the work, the CONTRACTOR shall properly dispose of approximately 95 existing standard-size spare membrane elements and spacers currently stored in three palletized crates (25 elements each) and three pallets containing non-crated membrane elements and spacers. This is in addition to the requirement that the CONTRACTOR properly dispose of all existing pressure vessels and membrane elements to be replaced under this project.
- B. The prime CONTRACTOR shall be a licensed General Contractor and have additional specialty qualifications, either in-house or through a specialty subcontractor, as specified below. The scope of work under this contract includes the furnishing of the specified NF membrane elements to replace the existing membrane elements. The CONTRACTOR shall retain the services of a pre-qualified Membrane Element Manufacturer (MEM). While the CONTRACTOR is responsible for all equipment, materials, and work under this Contract, certain services must be provided by the specified MEM. Wherever in these specifications equipment or services are specified to be provided by the "MEM" (rather than "CONTRACTOR"), they shall be provided directly by qualified employee(s) of the MEM.
- C. CONTRACTOR Minimum Qualifications: shall have a minimum of three municipal drinking water, reverse osmosis (RO) and/or NF membrane systems with a permeate capacity of 2.0 mgd or greater that have been commissioned within the past five (5) years and are currently in successful service. The CONTRACTOR shall also have fully installed within the past ten (10) years at least one RO or NF membrane system having an aggregate permeate production capacity of 5.0 mgd which is currently in successful service. The current staff of the CONTRACTOR shall have a minimum of five (5) years of experience in the design, procurement, installation supervision and startup of RO and NF membrane systems. The lead process engineer for the CONTRACTOR shall have a minimum of ten (10) years' experience in the design, procurement, installation supervision and startup of RO and NF membrane systems. The CONTRACTOR shall provide documentation that verifies the stainless steel pipe fabrication work for the above referenced NF installation(s) included pickling and passivation by full immersion and full penetration

welds for the stainless steel piping permeate J-bends in strict conformance to ANSI B31.3.

1.03 SUGGESTED WORK SEQUENCE

- A. A suggested work sequence shall be provided by the CONTRACTOR which will abide by constraints outlined in specification Section 01 52 00.
- B. A detailed sequence of construction shall be submitted by the CONTRACTOR and accepted by the CITY and ENGINEER prior to the commencement of any work. The CITY reserves the right to make changes to the sequence as necessary to facilitate the Work or to minimize any operations conflict with no cost impact from the CONTRACTOR.

1.04 WORK BY OTHERS

- A. The CONTRACTOR shall cooperate fully with all utility forces of the CITY, or other public or private agencies engaged in the relocation, altering, or otherwise rearranging any facilities which interfere with the progress of the work, and shall schedule the work to minimize interference with said relocation, altering, or rearranging of facilities.
- B. The CONTRACTOR'S attention is directed to the fact that work will be conducted at the site by other CONTRACTORS during the performance of the work under this Contract. The CONTRACTOR shall conduct its operations to cause a minimum of interference with the Work of such other CONTRACTORS, and shall cooperate fully with such CONTRACTORS to provide continued safe access to their respective portions of the site, as required to perform their respective contracts.
- C. When two or more contracts are being executed at one time on the same or adjacent land in such manner that Work on one contract may interfere with that on another, the CITY shall determine the sequence and order of the Work. When the territory of one contract is the necessary or convenient means of access for the execution of another CONTRACTOR, such privilege of access or any other reasonable privilege may be granted by the CITY to CONTRACTOR.

1.05 LOCATION OF THE PROJECT

- A. The project is located at the City of Hollywood's Water Treatment Plant at 3441 Hollywood Boulevard, Hollywood, Florida 33021.

1.06 CONTRACTOR FURNISHED MATERIAL AND EQUIPMENT

- A. All equipment, materials, or devices incorporated in this project shall be new and unused, unless indicated otherwise in the Contract Documents and shall be the products of reliable manufacturers who, unless otherwise specified, have been regularly engaged in the manufacture of such material and equipment for at least five (5) years. Procedures and additional requirements regarding manufacturer's experience and substitutions are included in Section 01 33 00 - Submittals.

1.07 DRAWINGS OF EXISTING FACILITIES

- A. Drawings of the existing facilities may be inspected at the City's Engineering and Construction Services Office. These drawings are for information only and are not a part of the Contract Documents. In making these drawings available for inspection, the CITY makes no guarantee, either expressed or implied, as to their accuracy or completeness.
- B. The CONTRACTOR shall contact representatives for other utilities, facilities in proximity of the work and Sunshine State One Call Inc., to obtain the as-built information from them directly. The utilities shown on Drawings are based upon available records supplied from various sources. The CITY makes no guarantee, either expressed or implied, as to their accuracy or completeness.

1.08 ITEMS SPECIFIED ON DRAWINGS

- A. Certain items of material and/or equipment, and their installation may be specified on the Drawings and not mentioned in the Specifications. Such items are to be considered as both shown on the Drawings and noted in the Specifications and be provided by the CONTRACTOR in accordance with the Specification on the Drawings.

1.09 FIELD LAYOUT OF WORK

- A. All work under this Contract shall be constructed in accordance with the Contract Drawings or as directed by the ENGINEER. Elevations of existing ground, structures and appurtenances are believed to be reasonably correct but are not guaranteed to be absolute and therefore are presented only as an approximation. Any error or apparent discrepancy in the data shown or omissions of data required for accurately accomplishing the stake-out survey shall be referred immediately to the ENGINEER for interpretation or correction.
- B. All survey work for construction control purposes shall be made by the CONTRACTOR at CONTRACTOR'S expense.
- C. The CONTRACTOR shall establish all base lines for the location of the principal component parts of the work together with benchmarks and batter boards adjacent to the work. Based upon the information provided by the Contract Drawings, the CONTRACTOR shall develop and make all detail surveys necessary for construction. The CITY will furnish information and location of existing benchmarks.
- D. The CONTRACTOR shall have the responsibility to carefully preserve the benchmarks, reference points and stakes. In case of destruction thereof by the CONTRACTOR or resulting from CONTRACTOR'S negligence, he shall be held liable for any expense and damage resulting therefrom and shall be responsible for any mistakes that may be caused by the unnecessary loss or disturbance of such bench marks, reference points and stakes.
- E. Existing or new control points, property markers, and monuments that will be established or are destroyed during the normal causes of construction shall be re-established by the CONTRACTOR; and all reference ties recorded therefore shall be furnished to the

ENGINEER. All computations necessary to establish the exact position of the work shall be made and preserved by the CONTRACTOR.

- F. The ENGINEER may check all or any portion of the work, and the CONTRACTOR shall afford all necessary assistance to the ENGINEER in carrying out such checks. Any necessary corrections to the work shall be performed immediately by the CONTRACTOR and he shall accept all responsibility for the accuracy and completeness of CONTRACTOR'S work.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

**** END OF SECTION**

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SECTION 01 10 11
TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 – GENERAL

1.01 HURRICANE PREPAREDNESS PLANNING

- A. If the project schedule coincides with the recognized South Florida hurricane season, June 1st through November 30th, the CONTRACTOR's attention is drawn to the possibility of hurricane conditions, or severe storm conditions, occurring at the job and plant site during the course of Contract work.
- B. Within 30-days of the date of Notice-to-Proceed, the CONTRACTOR shall submit to the ENGINEER and CITY a Hurricane Preparedness Plan. The plan should outline the necessary measures which the CONTRACTOR proposes to perform at no additional cost to the CITY in case of a hurricane warning.
- C. In the event of inclement weather, or whenever the ENGINEER shall direct, the CONTRACTOR shall, and will cause Sub-Contractors to carefully protect the Work and materials against damage or injury by reasons of failure on the part of the CONTRACTOR to so protect the Work. Such Work and materials so damaged shall be removed and replaced at the expense of the CONTRACTOR.
 - 1. Hurricane Watch: Upon designation of a hurricane watch, CONTRACTORS shall be responsible for storing all loose supplies and equipment on the job site that may pose a danger. The CONTRACTOR shall backfill all open holes in preparation of inclement weather. In addition, the CONTRACTOR shall remove all bulkheads and plugs in pipelines that would impede drainage in the case of flooding. Structures that may be in danger of floatation shall be flooded. The CONTRACTOR shall also cooperate with CITY personnel in protecting other structures at the site.
 - 2. Hurricane Warning: No mobile "temporary facility" under the control of the City of Hollywood, or on City property, shall be staffed during a hurricane warning. CONTRACTOR facilities meeting these criteria shall comply.
- D. The Hurricane Preparedness Plan may include sections, and outline actions to be taken by phase, including, but not limited to, the following:
 - 1. Purpose
 - 2. Definitions/Terminology
 - 3. Key Roles/Responsibilities
 - 4. Procedures/Processes – Including company standard procedures, if any.
 - 5. Project Specific Procedures

6. Preparations
7. Housekeeping – Disposal of Scrap Material, Emptying or Securing of Dumpsters as Applicable
8. Site Superintendent Responsibilities
9. Functional (Civil, Mechanical, etc.) Superintendent Responsibilities
10. Site/Office Personnel Responsibilities
11. Timeline Checklists
 - Before Hurricane – Key personnel identification, emergency planning, etc.
 - Hurricane Alert (72 to 48 hours before landfall) – Personnel alert, personnel and vehicle preparation, etc.
 - Hurricane Watch (48 to 24 hours before landfall) – Suspension of construction operations; securing of material in the contractor’s staging area and jobsite, trailers, documents; removal of non-essential MOT devices and flow obstructions; videotaping or photographing pre-existing site conditions; checking of emergency supplies; fueling of vehicles, equipment, generators, and fuel storage tanks; communication planning with CITY, etc.
 - Hurricane Warning (landfall within 24 hours) – Evacuations as necessary; securing of offices or trailers with plywood; securing loose material with earth; securing of barricades by “half burial” or “double sandbags”; removal of road signs or items that could be airborne under high wind conditions; lowering of booms on cranes, well drilling rigs, or excavators.
 - 12-Hour Checklist
 - Post-Storm

E. The CONTRACTOR is advised to take all necessary precautions to protect his equipment by moving it to higher ground if in an area subject to flooding. Known areas of Hollywood that would be subject to flooding from storm tides include:

Hollywood Blvd.	North Lake Area	South Lake Area
A1A	Sheridan Street	Dania Beach Blvd.
US Highway 1	46th Avenue	Hallandale Beach Blvd.

**** END OF SECTION ****

SECTION 01 20 00
PROJECT MEETINGS

PART 1 GENERAL

1.01 PRECONSTRUCTION

- A. A mandatory preconstruction meeting will be held to acquaint representatives of the Department and various other agencies with those in responsible charge of the CONTRACTOR's activities for the project. Unless otherwise directed by the Department, no construction activities relating to this contract shall commence until after the pre-construction meeting has been adjourned, and until any pending business from the meeting has been addressed by the CONTRACTOR to the satisfaction of the Department and ENGINEER. The meeting will cover such subjects as the following:
1. Insurance certificates
 2. Permits and licenses
 3. Affirmative action employment
 4. Construction schedules
 5. Cost breakdown and applications for payment
 6. Material deliveries, storage and payments
 7. Shop drawings and submittals
 8. Job-site inspection by the ENGINEER
 9. Safety and emergency action procedures
 10. Operations of the existing utilities
 11. Field offices, security and other housekeeping procedures
 12. List of subcontractors
 13. Liquidated damages
 14. Communications
 15. Coordinating
 16. All other appropriate matters.

1.02 PROGRESS

- A. A progress meeting shall be held on a once-per-week basis for the purpose of coordinating and expediting the work. The CONTRACTOR, as a part of his obligations under the Contract, shall attend in person or by an authorized representative to attend and to act on his behalf. The ENGINEER will conduct such meetings and as necessary, with the CONTRACTOR's input, issue an agenda.
- B. In addition, the ENGINEER or CONTRACTOR may call for special job site meetings for the purpose of resolving unforeseen problems or conflicts which may impede the construction schedule. The ENGINEER will prepare a brief summary report of the decisions or understandings concerning each of the items discussed at the meeting.
- C. At weekly progress meetings, the CONTRACTOR shall submit to the ENGINEER for review a current three (3) week progress schedule. This schedule submission shall include a two

week look ahead schedule and reflect status of the work performed during the preceding week.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

**** END OF SECTION ****

SECTION 01 25 00

BASIS OF PAYMENT

PART 1 - GENERAL

1.01 GENERAL

- A. Payments to the CONTRACTOR shall be made on the basis of the bid items listed on the Proposal Bid Form as full and complete payment for furnishing all materials, labor, tools and equipment, and for performing all operations necessary to complete the work included in the Contract Documents. Such compensation shall also include payments for any loss or damages arising directly or indirectly from the work, or from any discrepancies between the actual quantities of work and those shown in the Contract Documents, or from any unforeseen difficulties which may be encountered during the prosecution of the work until the final acceptance by the CITY.
- B. The prices stated in the proposal include full compensation for overhead and profit, all costs and expenses for taxes, labor, equipment, materials, commissions, transportation charges and expenses, patent fees and royalties, labor for handling materials during inspection, furnishing and repairing small tools and ordinary equipment, mobilization, home office expenses and general supervision, bond, insurance, labor for handling materials during inspection, together with any and all other costs and expenses for performing and completing the work as shown on the Drawings and specified herein. In addition, the CONTRACTOR shall include the actual cost of social security taxes, unemployment insurance, worker's compensation, fringe benefits, inclusive of life and health insurance, union dues, pension, pension Drawings, vacations, and insurance and CONTRACTOR's public liability and property damage insurance involved in the work based on the actual wages paid to such labor and all other general costs and profits, prorated to each Item.
- C. Unless otherwise specifically stated elsewhere herein, the CONTRACTOR shall include in the prices bid all materials, electrical supply, fuel, lubricants, temporary equipment, temporary wiring, temporary piping and fittings, pumps, gages, and all other items of whatever nature required to completely test, balance, disinfect if required, and put into fully operational condition all equipment and/or systems supplied by either the CITY or the CONTRACTOR and installed as a part of this Project. Further, any test materials supplied by the CONTRACTOR shall be completely satisfactory to the CITY. Any decision as to whether a particular material is suitable for test purposes shall be at the sole discretion of the ENGINEER whose decision shall be final. Any material considered not suitable shall be immediately replaced by the CONTRACTOR with suitable material and no extra compensation will be allowed.
- D. The Basis of Payment for an item at the price shown in the Proposal shall be in accordance with its description of the item in this Section and as related to the work specified and as shown on the Drawings. Unit prices, where used, will be applied to the actual quantities furnished and installed in conformance with the Contract Documents.
- E. The CONTRACTOR'S attention is called to the fact that the quotations for the various items of work are intended to obtain a complete and working installation under this Contract, and any items of labor, equipment or materials which may reasonably be assumed as necessary to accomplish this end shall be supplied whether or not they are

specifically shown on the Drawings or stated herein. Should the CONTRACTOR feel that the cost of any item of work has not been established by the Proposal Bid Form, he shall include the cost for that work in the Bid Item most closely associates with that work so that his proposal for the Project does reflect his total price for completing the work in its entirety.

- F. The CONTRACTOR shall submit, with each Payment Request, a list of MBE/WBE SUBCONTRACTOR's, that he is or will be utilizing for his contract. For each MBE/WBE SUBCONTRACTOR, the following information shall be provided:
1. Total sub-contract dollar amount.
 2. Amount paid to date.

1.02 MEASUREMENT

- A. The quantities for payment under this Contract shall be determined by actual measurement of the completed items, in place, ready for service and accepted by the CITY, in accordance with the Proposal Bid Form as described in Section 00 30 10, unless otherwise specified. A representative of the CONTRACTOR shall witness all field measurements.

1.03 PAYMENT ITEMS

A. Base Bid Items

1. Bid Item No. 1 – Furnish replacement membrane pressure vessels, including all associated accessories, connections, and adapters necessary for installation on the existing NF units: The unit price per pressure vessel assembly shall be full payment for all labor, equipment, materials, costs, taxes, and delivery to the site of each pressure vessel assembly, as specified in the Contract Documents. The work shall also include the preparation of submittals, shop drawings, operation and maintenance data, warranties, and other documentation for the pressure vessel assemblies. Note that installation of the pressure vessel assemblies is covered under Bid Item 3.
2. Bid Item No. 2 – Furnish replacement membrane elements, including all associated accessories, connections, and adapters necessary for installation in the new pressure vessels, including 21 spare elements: The unit price per membrane element shall be full payment for all labor, equipment, materials, costs, taxes, and delivery to the site of each membrane element, as specified in the Contract Documents. The work shall also include the preparation of submittals, shop drawings, operation and maintenance data, warranties, and other documentation for the membrane elements. Note that installation of the membrane elements is covered under Bid Item 3.
3. Bid Item No. 3 – Complete installation, start-up, and testing of replacement pressure vessels and membrane elements for each NF unit: The unit price per NF unit shall be full payment for all labor, equipment, materials, and testing for all work necessary and required to take the existing NF unit out of service, complete the required disassembly of necessary components of the NF unit, remove and dispose of existing pressure vessels, membrane elements, and other associated components that will not be reused, install, and adjust the new membrane pressure vessels and make the system ready for installation of new membrane elements, install the new membrane elements, and start up, test, and place into full, normal operation the upgraded NF

Updated Per
Addendum #1
(06/12/2024)

Updated Per
Addendum #1
(06/12/2024)

unit. The work shall also include the preparation of submittals, dimensioned fabrication and layout drawings, and record drawings.

4. Bid Item No. 4 – Provide all other CONTRACTOR and MEM services not included in other bid items: The lump sum price for this item shall be full payment for all labor, equipment, materials, delivery, and testing for all work necessary and required under in the Contract Documents not included under other bid items. This includes but is not limited to Owner training, warranty services, operations and monitoring assistance, and all other CONTRACTOR and MEM services not covered under other bid items.
5. Bid Item No. 5 – Contingency: Included in this contingency are activities associated with unforeseen conditions or other work to be authorized at the discretion of the City. All work authorized from this allowance must be authorized in writing by the City. Amount to be paid shall be negotiated and agreed to by both parties. The City reserves the right to award any, all, or none of the money associated with this allowance.
6. Bid Item No. 6 – Indemnification: The lump sum price for this item shall be full payment for indemnification of the Owner, as required in the Conditions of the Contract and other provisions in the Contract Documents.
7. Bid Item No. 7 – Mobilization: The lump sum price for this item shall be full payment for all labor, materials, equipment, expenses, fees, taxes, overhead, and profit necessary to mobilize all required equipment, materials, labor forces, temporary facilities, permits, etc. to the project site, ready to begin work on the project. Payment will be made at the bid price based on percent complete of the Work under this item. Payment item for mobilization/demobilization shall not exceed three percent (3%) of the Contract Price. Any amount over 3% of the Contract Price will be paid with the Contractor's final application for payment.
8. Bid Item No. 8 – Demobilization: The lump sum price for this item shall be full payment for all labor, materials, equipment, expenses, fees, taxes, overhead, and profit necessary to demobilize all required equipment, materials, labor forces, temporary facilities, permits, restoration work, all necessary restoration, and administrative activities associated with project close-out, etc. Payment will be made at the bid price based on percent complete of the Work under this item. Payment item for demobilization shall not exceed two percent (2%) of the Contract Price. Any amount over 2% of the Contract Price will be paid with the Contractor's final application for payment.
9. Bid Item No. 9 – Testing/Permitting: This allowance shall be paid by the City for all project testing and permitting the Contractor may incur. All work authorized from this allowance must be authorized in writing by the City. Amount to be paid shall be negotiated and agreed to by both parties. The City reserves the right to award any, all, or none of the money associated with this allowance.

B. The price bid for each item shall be stated in both words figures in the appropriate places in the Proposal Bid Form. All blank spaces for bid prices must be filled in with ink, or with a typewriter. The Bidder is further directed that any and all alterations, changes, corrections and modifications, made to the Proposal Bid Form prior to submission of the bids, must be initialed by the Bidder. Non-compliance by the Bidder of this directive may be grounds for rejection of his bid.

C. In the event that there is a discrepancy between the price written in words and the price written in numbers, the price written in words shall govern except where the number of

units multiplied by the unit price shown in numbers equals the total price for that bid item. In such case, the unit price shown in numbers shall govern over the unit price shown in words.

- D. Where an error is made in the calculation of the total bid price of an item, the unit price shall govern.
- E. If the bidder makes an error in his addition of the total bid prices of the applicable items in the Quotation, the correct sum of its' applicable bid item totals shall be the Total Bid.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 33 00

SUBMITTALS

PART 1 - GENERAL

1.01 THE REQUIREMENT

- A. This section specifies the means of all submittals. All submittals, whether their final destination is to the City, ENGINEER, or other representatives of the City, shall be directed through the ENGINEER. A summary of the key types of submittals and the number of copies required is as follows:

Copies to Engineer	Type of Submittal
4	Construction schedule
4	Schedule of payment items
1	Audio visual preconstruction record
6	Progress estimates
4	Shop drawings
4	Certificates of compliance
2	Warranties
1*	Product samples
1	Record drawings
5	Final Record Drawings

*Unless otherwise required in the specific Section where requested.

1.02 SUBMITTAL PROCEDURES

- A. Transmit each submittal with a form acceptable to the ENGINEER, clearly identifying the project CONTRACTOR, the enclosed material and other pertinent information specified in other parts of this section. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- B. Revise and resubmit submittals as required, identify all changes made since previous submittals. Resubmittals shall be noted as such.
- C. Distribute electronic copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

1.03 CONSTRUCTION PROGRESS SCHEDULE

- A. The CONTRACTOR shall have the capability of preparing and utilizing the specified construction progress scheduling techniques. A statement of capability shall be submitted in writing to the ENGINEER with the return of the executed Agreement to the City and will verify that either the CONTRACTOR's organization has in-house capability qualified to use the technique or that the CONTRACTOR employs a consultant who is so qualified. Capability shall be verified by description of the construction projects to which the CONTRACTOR or its consultant has successfully applied the scheduling technique and which were controlled throughout the duration of the project by means of systematic use and updating of the construction progress schedule, the network analysis and associated reports. The submittal shall include the name of the individual on the CONTRACTOR's staff who will be responsible for the construction progress schedule, and associated reports and for providing the required updating information of same. The CONTRACTOR shall submit its proposed progress (baseline) schedule to the ENGINEER for review and comment within thirty days of the Notice to Award. The ENGINEER shall have the authority to determine acceptability/correctness of the schedule logic and activity interrelationships. The use of extraneous, nonworking activities and activities which add restraints to the construction schedule shall not be accepted. Baseline schedules that do not meet their contract completion dates shall not be accepted.
- B. The CONTRACTOR's progress schedule (baseline and monthly updates) shall be computer generated and resource loaded. Each construction progress schedule, and associated report shall include the following tabulations: a list of activities in numerical order, a list of activity precedence, schedules sequenced by Early Start Date, Total Float, and Late Start Date. Each schedule and report shall include the following minimum items.
1. Activity Numbers
 2. Estimated Duration
 3. Activity Description
 4. Early Start Date (Calendar Dated)
 5. Early Finish Date (Calendar Dated)
 6. Latest Allowable Start Date (Calendar Dated)
 7. Latest Allowable Finish Date (Calendar Dated)
 8. Status (whether critical)
 9. Estimated Cost of The Activity
 10. Total Float and Free Float
- C. In addition, each construction progress schedule, network analysis and report shall be prefaced with the following summary data:
1. Contract Name and Number
 2. CONTRACTOR's Name
 3. Contract Duration and Float
 4. Contract Schedule
 5. The Effective or Starting Date of The Schedule (the date indicated in the Notice-to-Proceed)

- D. The work day to calendar date correlation shall be based on an 8-hour day and 40-hour week with adequate allowance for holidays and all other special requirements of the Work. A total of six (6) days for adverse weather shall also be allowed for in the progress schedule.
- E. If the CONTRACTOR desires to make changes in its method of operating which affect the construction progress schedule and related items, the CONTRACTOR shall notify the ENGINEER in writing stating what changes are proposed and the reason for the change. If the ENGINEER accepts these changes, in writing, the CONTRACTOR shall revise and submit, without additional cost to the City, all of the affected portions of the construction progress schedule, and associated reports. The construction progress schedule and related items shall be adjusted by the CONTRACTOR only after prior acceptance, in writing by the ENGINEER. Adjustments may consist of changing portions of the activity sequence, activity durations, division of activities, or other adjustments as may be required. The addition of extraneous, nonworking activities and activities which add restraints to the construction progress schedule shall not be accepted.
- F. Except where earlier completions are specified, schedule dates which show completion of all Work prior to the contract completion date shall, in no event, be the basis for claim for delay against the City by the CONTRACTOR.
- G. Construction progress schedules and related items which contain activities showing negative float or which extend beyond the contract completion date will not be accepted by the ENGINEER.
- H. Whenever it becomes apparent from the current construction progress schedule and associated reports that delays to the critical path have resulted and the contract completion date will not be met, or when so directed by the ENGINEER, the CONTRACTOR shall take some or all of the following actions at no additional cost to the City. They shall submit to the ENGINEER for approval, a written statement of the steps they intend to take to remove or arrest the delay to the critical path in the current construction progress schedule, including a computer-generated schedule revision to reflect proposed actions.
 - 1. Increase construction manpower in such quantities and crafts as will substantially eliminate the backlog of work.
 - 2. Increase the number of working hours per shift, shifts per day, working days per week, the amount of construction equipment, or any combination of the foregoing, sufficiently to substantially eliminate the backlog of work.
 - 3. Reschedule activities to achieve maximum practical concurrency of accomplishment of activities, and comply with the revised schedule.
- I. If when so requested by the ENGINEER, the CONTRACTOR should fail to submit a written statement of the steps they intend to take or should fail to take such steps as reviewed and accepted in writing by the ENGINEER, the ENGINEER may direct the CONTRACTOR to increase the level of effort in manpower (trades), equipment and work schedule (overtime, weekend and holiday work, etc.) to be employed by the CONTRACTOR in order to remove or arrest the delay to the critical path in the current construction progress schedule, and the CONTRACTOR shall promptly provide such level of effort at no additional cost to the City.
- J. If the completion of any activity, whether or not critical, falls more than 100 percent behind its previously scheduled and accepted duration, the CONTRACTOR shall submit

for approval a schedule adjustment showing each such activity divided into two activities reflecting completed versus uncompleted work.

- K. Shop drawings which are not approved on the first submittal or within the time scheduled, and equipment which does not pass the specified tests and certifications shall be immediately rescheduled.
- L. The contract time will be adjusted only in accordance with the General Requirements and other portions of the Contract Documents as may be applicable. If the ENGINEER finds that the CONTRACTOR is entitled to any extension of the contract completion date, the ENGINEER's determination as to the total number of days extension shall be based upon the current construction progress schedule and on all data relevant to the extension. Such data shall be included in the next updating of the schedule and related items. Actual delays in activities which, according to the construction progress schedule, do not affect any contract completion date will not be the basis for a change therein.
- M. From time to time it may be necessary for the contract schedule of completion time to be adjusted by the City in accordance with the General Requirements and other portions of the Contract Documents as may be applicable. Under such conditions, the ENGINEER will direct the CONTRACTOR to reschedule the Work or contract completion time to reflect the changed conditions, and the CONTRACTOR shall revise the construction progress schedule and related items accordingly, at no additional cost to the City.
- N. Available float time may be used by the City through the City's ENGINEER.
- O. The City controls the float time and, therefore, without obligation to extend either the overall completion date or any intermediate completion dates, the City may initiate changes that absorb float time only. City initiated changes that affect the critical path on the network diagram shall be the sole grounds for extending the completion dates. CONTRACTOR initiated changes that encroach on the float time may be accomplished only with the City's concurrence. Such changes, however, shall give way to City initiated changes competing for the same float time.
- P. To the extent that the construction project schedule, or associated report or any revision thereof shows anything not jointly agreed upon or fails to show anything jointly agreed upon, it shall not be deemed to have been accepted by the ENGINEER. Failure to include on a schedule any element of Work required for the performance of this Contract shall not excuse the CONTRACTOR from completing all Work required within any applicable completion date, not withstanding the review of the schedule by the ENGINEER.
- Q. Review and acceptance of the construction progress schedule, and related reports, by the ENGINEER is advisory only and shall not relieve the CONTRACTOR of the responsibility for accomplishing the Work within the contract completion date. Omissions and errors in the construction progress schedule, and related reports shall not excuse performance less than that required by the Contract and in no way make the ENGINEER an insurer of the CONTRACTOR's success or liable for time or cost overruns flowing from any shortcomings in the construction progress schedule, and related reports.
- R. The CONTRACTOR shall present and discuss the proposed schedule at the preconstruction conference.

- S. The construction progress schedule shall be based upon the precedence diagramming method of scheduling and shall be prepared in the form of a horizontal bar chart showing in detail the proposed sequence of the Work and identifying all construction activities included but not limited to yard piping, all structures and treatment units and all related Work specified herein to be performed under the Contract. The schedule shall be time scaled, identifying the first day of each week, with the estimated date of starting and completion of each stage of the Work in order to complete the project within the contract time. The project critical path shall be clearly identified in color or by other means acceptable to the ENGINEER.
- T. The progress schedule shall be plotted on 22-inch by 34-inch and 11-inch by 17-inch paper and shall be revised and updated monthly, depicting progress through the last day of the current month and scheduled progress through completion. Ten (one 22-inch by 34-inch and nine 11-inch by 17-inch), schedules, required schedule “sorts” (tabulations) and an electronic copy of the baseline schedule shall be submitted for review and acceptance. Five (one 22-inch by 34-inch and four 11-inch x 17-inch) up-to-date copies of the schedule and five copies of tabulations and an electronic copy shall be submitted along with the application for monthly progress payments for the same period.
- U. The construction progress schedule shall be developed and maintained using Primavera Sure Trak as manufactured by Primavera Systems, Inc., or equal.

1.04 SCHEDULE OF PAYMENT VALUES

- A. The CONTRACTOR shall submit a Schedule of Payment Values, in accordance with Section 01025, for all items in the proposal that are to be paid for on a lump sum basis. The schedule shall contain the labor and material values of the component parts of Work for the purpose of making progress payments during the construction period. The Schedule of Payment Values shall directly correlate on an item by item basis (unless otherwise accepted by the ENGINEER) to each individual activity detailed in the construction progress schedule.
- B. The schedule shall be given in sufficient detail for the proper identification of Work accomplished. Each item shall include its proportional share of all costs including the CONTRACTOR's overhead, contingencies and profit. The sum of all scheduled items shall equal the total value of the Contract.
- C. If the CONTRACTOR anticipates the need for payment for materials stored on the project site, it shall also submit a separate list covering the cost of materials, delivered and unloaded with taxes paid. This list shall also include the installed value of the item with coded reference to the Work items in the Schedule of Payment Items.
- D. The CONTRACTOR shall expand or modify the above schedule and materials listing as required by the ENGINEER's initial or subsequent reviews.
- E. The CONTRACTOR shall update the Schedule of Payment Values monthly for reviewing by the ENGINEER. The payment applications shall be reviewed by the ENGINEER in accordance with the updated Schedule of Payment Values.

1.05 SHOP DRAWINGS, PROJECT DATA AND SAMPLES

- A. General: A Shop Drawing Submittal Schedule shall be provided by the CONTRACTOR within thirty (30) days of the Notice to Proceed.
- B. The CONTRACTOR shall furnish for review four (4) electronic copies of shop drawings, project data, samples and other submittal items required by the Contract Documents. Two (2) copies shall be returned to the CONTRACTOR stamped "Furnish as Submitted" or "Furnish as Corrected". Where major corrections are indicated, two (2) electronic copies will be returned stamped "Revise and Resubmit" and a new submittal is required (4 electronic copies).
- C. The review of the CONTRACTOR's submissions shall in no way relieve the CONTRACTOR of any of his responsibilities under the Contract. An acceptance of a submission shall be interpreted to mean that there are no specific objections to the submitted material, subject to conformance with the Contract Drawings and Specifications.
- D. All submissions shall be dated and properly referenced to the specifications section and Contract Drawing number. The submittal number shall match the following submittal numbering system (or an equivalent system as approved by the ENGINEER):
 - 1. Submittal Numbering System
 - a. Package ID: The package number will reflect the CSI (specification) section number as it appears in the specifications.
 - b. Subgroup ID: The submittal number will include the CSI number followed by two additional codes. The first will define the type of submittal as follows:

- 01 - Product Data, Specifications, Cut Sheets, Manufacturers certification or approval letters.
- 02 - Shop Drawings
- 03 - Product Samples and Mock-Ups
- 04 - Special requirements as required in the contract documents
- 05 - As-Built Drawings
- 06 - Warranties
- 07 - O&M
- 08 - Spare Parts

The second code will identify individual submittals within that submittal type. The number to the left of the decimal represents the submittal number and the number to the right of the decimal represents the revision number.

Example:

<u>Package</u>	<u>Submittal</u>	<u>Description</u>
03300	03300-01-1.1	Concrete Admixture A, First Submittal
06400	06400-01-1.2	Re-submittal
		First Submittal
		Product Data
		Finish Carpentry

By the following this code system, all submittals may be entered into the Document Tracking System prior to receipt of submittals. When a particular submittal is received, locate the entry in the Document Tracking project file, add the appropriate information and process. The Document Tracking System will provide the next sequence number.

- E. Shop Drawings and Project Data within practical limits shall be submitted as a single complete package for any operating system and shall include all items of equipment and mechanical units involved in the functioning of such system. Where applicable, the submission shall include elementary wiring diagrams showing circuit functioning and necessary interconnection wiring diagrams for construction.
- F. All submissions shall bear the CONTRACTOR's stamp certifying that they have been checked for conformance and accuracy. Submissions without the CONTRACTOR's stamp of approval will not be reviewed by the ENGINEER and will be returned to the CONTRACTOR.
- G. For any submission containing any departure from the Contract Documents and the CONTRACTOR shall include proper explanation in his letter of submittal.
- H. Work on fabricated or special items shall not be commenced until the required submission information has been reviewed and accepted.
- I. Standard items shall not be assembled or shipped until the required submission information has been reviewed and accepted.
- J. Prior review actions shall not relieve the CONTRACTOR of the responsibility for correcting errors, deviations, and/or omissions discovered at a later date.
- K. Shop Drawings: Shop Drawings include, but are not limited to, layout drawings, installation drawings, construction drawings, certified and interconnecting wiring diagrams, etc. The CONTRACTOR shall be responsible for security of all the information, details, dimension, drawings, etc. necessary to prepare submission drawings required and necessary under this Contract and to fulfill all other requirements of his Contract. The CONTRACTOR shall secure such information, details, drawings, etc. from all possible sources including the Contract Drawings, drawings prepared by subcontractor's, ENGINEER, manufacturers, Contractors, etc.

- L. Submission drawings shall accurately and clearly present the following:
 - 1. All working and installation dimensions.
 - 2. Arrangement and sectional views.
 - 3. Units of equipment in the proposed position for installation, details of required attachments and connections and dimensioned locations between units and in relation to the structures.
 - 4. Necessary details and information for making connections between the various trades including but not limited to, power supplies and interconnection wiring between units, accessories, appurtenances, etc.
- M. Product Data: Where manufacturer's publications in the form of catalogs, brochures, illustrations, or other data sheets are submitted in lieu of prepared shop drawings, such submission shall specifically indicate the particular item offered. Identification of such items and relative pertinent information shall be made with indelible ink. Submissions showing only general information will not be accepted.
- N. Product data shall include materials of construction, dimensions, performance characteristics, capacities, wiring diagrams, piping and controls, etc.
- O. Samples: CONTRACTOR shall furnish for review all samples as required by the Contract Documents or requested by the ENGINEER.
- P. Samples shall be of sufficient size or quantity to clearly illustrate the quality, type, range of color, finish or texture and shall be properly labeled to show the nature of the work where the material represented by the sample will be used.
- Q. Samples shall be checked by the CONTRACTOR for conformance to the Contract Documents before being submitted to the ENGINEER and shall bear the CONTRACTOR's stamp certifying that they have been so checked. Transportation charges on samples submitted to the ENGINEER shall be prepaid by the CONTRACTOR.
- R. ENGINEER's review will be for compliance with the Contract Documents, and his comments will be transmitted to the CONTRACTOR with reasonable promptness.
- S. Accepted samples will establish the standards by which the completed work will be judged.

1.06 OPERATION AND MAINTENANCE INSTRUCTIONS (MANUALS)

- A. Individual Instructions: The CONTRACTOR, through manufacturer's representatives or other qualified individuals, shall provide instruction of designated employees of the CITY in the operation and care of all equipment furnished.
- B. Written Instructions: The CONTRACTOR shall furnish and deliver to the ENGINEER, prior to the fifty percent completion point of construction, and no later than thirty (30) days prior to operator training, ten (10) complete sets of instructions, technical bulletins, and any other printed matter such as diagrams, prints or drawings, containing full information required for the proper operation, maintenance, and repair of the equipment. As a minimum, the following shall be included in this submittal:
 - 1. Operating Instructions

2. Troubleshooting Information
 3. Maintenance Schedule(s)
 4. Lubrication Schedule
 5. Location of Service Centers
 6. Parts Diagram and List
 7. Spare Parts List (spare parts furnished shall be defined)
 8. Special Tools List
 9. Installation Instructions
 10. Assembly & Erection Drawings
 11. Dimensional Drawings
 12. Wiring Diagram(s)
 13. Storage Instructions
- C. These requirements are a prerequisite to the operation and acceptance of equipment. Each set of instructions shall be bound together in appropriate three-ring binders. A detailed Table of Contents shall be provided for each set. Written operation and maintenance instructions shall be required for all equipment items supplied for this project. The amount of detail shall be commensurate with the complexity of the equipment item. Submittal shall be made for all mechanical and electrical equipment included but not limited to pumps, valves, gates, etc.
- D. Information not applicable to the specific piece of equipment installed on this project shall be struck from the submission. Information provided shall include a source of replacement parts and names of service representatives, including address and telephone number.
- E. Extensive pictorial cuts of equipment are required for operator reference in servicing.
- F. When written instructions include shop drawings and other information previously reviewed by the ENGINEER, only those editions thereof which were accepted by the ENGINEER, and which accurately depict the equipment installed, shall be incorporated in the instructions.

1.07 RECORD DRAWINGS

- A. The CONTRACTOR shall keep and maintain, at the job site, one record set of Drawings. On these, it shall mark all project conditions, locations, configurations, and any other changes or deviations which may vary from the details represented on the original Contract Drawings, including buried or concealed construction and utility features which are revealed during the course of construction. Special attention shall be given to recording the horizontal and vertical location of all buried utilities that differ from the locations indicated, or which were not indicated on the Drawings. As-Built furnished grade information shall be included on the record drawings. Said record drawings shall be supplemented by detailed sketches as necessary or directed to indicate, fully, the Work as actually constructed. These master record drawings of the CONTRACTOR's representation of as-build conditions, including all revisions made necessary by addenda and change orders shall be maintained up-to-date during the progress of Work.

- B. The record drawings shall be received on the 20th working day of every third month after the month in which the final notice to proceed is given as well as on completion of Work. Failure to maintain the record drawings up-to-date shall be grounds of withholding monthly progress payments until such time as the record drawings are brought up-to-date.
- C. In the case of those drawings which depict the detail requirement for equipment to be assembled and wired in the factory, such as motor control centers and the like, the record drawing shall be updated by indicating those portions which are superseded by change order drawings or final shop drawings, and by including appropriate reference information describing the change orders by number and the shop drawings by manufacturer, drawing, and revision numbers.
- D. Record drawings shall be accessible to the ENGINEER at all times during the construction period.
- E. Upon substantial completion of the Work and prior to final acceptance, the CONTRACTOR shall finalize and deliver a complete set of final record drawings to the ENGINEER for transmittal to the City, conforming to the construction records of the CONTRACTOR. This set of drawings shall consist of corrected drawings showing the reported location of the Work. The information submitted by the CONTRACTOR and incorporated in the Final Record Drawings will be assumed to be correct, and the ENGINEER will not be responsible for the accuracy of such information, and for any errors or omissions which may appear on the Final Record Drawings as a result.
- F. The information submitted by the CONTRACTOR in the Final Record Drawings shall be certified by a land surveyor registered in the State of Florida. For clarity, Final Record Drawings needs to be redrawn and clearly labeled as "Record Drawings". Notations indicated in the drawings shall be legible and printed in black ink. No handwritten notes are allowed.
- G. Final payment will not be acted upon until the ENGINEER certifies the record drawings as required by the agencies having jurisdiction. Said up-to-date record drawings shall be in the form of a set of prints with carefully plotted information.
- H. All final record drawings shall be certified by the ENGINEER of Record. Such certification shall evidence that ENGINEER has reviewed the information, finds it in substantial accordance with the design; and where deviations from the design exist, that said deviations are not to the detriment of the system. ENGINEER's certification shall read as follows:
 - 1. "I HEREBY NOTIFY THE CITY OF THE COMPLETION OF CONSTRUCTION OF ALL THE COMPONENTS OF THE WATER, SEWER AND STORMWATER FACILITIES FOR THE ABOVE REFERENCED PROJECT AND CERTIFY THAT THEY HAVE BEEN CONSTRUCTED IN SUBSTANTIAL CONFORMANCE WITH THE PLANS AND SPECIFICATIONS PERMITTED BY THE AGENCIES HAVING JURISDICTION"
- I. The CONTRACTOR shall submit all electronic media files of the paving, grading, water, sewer and drainage plans, reports, other supporting information, and the final version of as-builts drawings shall be submitted to the ENGINEER's office. The information provided shall contain an index file with a brief description of the electronic filing contents, and shall be labeled with project name, company name, and point of contact. Documents and

spreadsheets shall be submitted in either MS Word, Word Perfect, Excel, Lotus, or other format approved by the ENGINEER. Drawings shall be submitted in AutoCad, Microstation, or other format approved by the ENGINEER.

- J. Final Record Drawings submitted to the City as part of the project acceptance shall contain at least the following information:
 - 1. Drawings shall be legibly marked to record actual construction.
 - 2. Drawings shall show actual location of all underground and above ground water and wastewater, stormwater piping and related appurtenances. All changes to piping location including horizontal and vertical locations of utilities and appurtenances shall be clearly shown and referenced to permanent surface improvements. Drawings shall also show actual installed pipe material, class, etc. Profile sheets shall be updated to include all field measurements and elevations taken during construction.
 - 3. Drawings shall clearly show all field changes of dimension and detail including changes made by field order or by change order.
 - 4. Drawings shall clearly show all details not on original contract drawings but constructed in the field. All equipment and piping relocation shall be clearly shown.
 - 5. Location of all manholes, hydrants, tees, reducers, crosses, valves, and valve boxes shall be shown. All tees, reducers, crosses, and valves shall be referenced from at least two (2) and preferably three (3) permanent points such as building corners and roadway intersections.
 - 6. Dimensions between all manholes shall be field verified and shown. The rim, inverts and grade elevations of all manholes shall be shown.

1.08 WARRANTIES

- A. Original warranties, called for in the Contract Documents, shall be submitted to the City through the ENGINEER. When warranties are required, they shall be submitted prior to request for payment.
- B. When advance copies of warranties are requested, they shall be submitted with, and considered as shop drawings.
- C. The CONTRACTOR shall warrant to the City that all material and labor used in the construction are covered by his warrantee for a minimum of a one-year period upon approval and acceptance by the City. The CONTRACTOR shall replace or repair defects at no cost to the City during the warrantee period. No visible or potential leakage shall be allowed during the warrantee period.

1.09 CERTIFICATES

- A. Copies of certificates of compliance and test reports shall be submitted for requested items to the ENGINEER prior to request for payment.

1.10 AUDIO-VISUAL PRECONSTRUCTION RECORD

- A. General: Prior to commencing work, the CONTRACTOR shall have a continuous color audio-video DVD recording taken of the entire Project, including existing areas that will be disturbed by the CONTRACTOR's operations, to serve as a record of preconstruction

- conditions. No construction shall begin prior to review and acceptance of the tapes covering the respective, affected construction area by the ENGINEER. The ENGINEER shall have the authority to reject all or any portion of the video DVD not conforming to the specifications and order that it be redone at no additional charge. The CONTRACTOR shall reschedule unacceptable coverage within five days after being notified. The ENGINEER shall designate those areas, if any, to be omitted from or added to the audio-video coverage. Audio-video recordings shall not be performed more than ninety days prior to construction in any area. All DVDs and written records shall become property of the City.
- B. Services: The CONTRACTOR shall engage the services of a professional electrographer. The color audio-video tapes shall be prepared by a responsible commercial firm known to be skilled and regularly engaged in the business of preconstruction color audio-video tape documentation. The electrographer shall furnish to the ENGINEER a list of all equipment to be used for the audio-video taping, i.e., manufacturer's name, model number, specifications and other pertinent information. Additional information to be furnished by the electrographer is the names and addresses of two references that the electrographer has performed color audio-video taping for on projects of a similar nature within the last twelve months.
- C. Audio-Video DVDs: Audio-video DVDs shall be new. The DVDs shall be compatible for with a standard player-receiver.
- D. Equipment: All equipment, accessories, materials and labor to perform this service shall be furnished by the CONTRACTOR.
1. The total audio-video system shall reproduce bright, sharp, clear pictures with accurate colors and shall be free from distortion, tearing, rolls or any other form of imperfection. The audio portion of the recording shall reproduce the commentary of the camera operator with proper volume and clarity, and be free from distortion and interruptions.
 2. When conventional wheeled vehicles are used, the distance from the camera lens to the ground shall not be less than twelve feet. In some instances, audio-video tape coverage may be required in areas not accessible by conventional wheeled vehicles. Such coverage shall be obtained by walking or special conveyance acceptable to the ENGINEER.
 3. The color video camera used in the recording system shall have a horizontal resolution of 300 lines at center, a luminance signal to noise ratio of 45 dB and a minimum illumination requirement of twenty-five foot-candles.
- E. Recorded Information - Audio: Each tape shall begin with the current date, project name and municipality and be followed by the general location; i.e., process structure, or area, viewing side and direction of progress. The audio track shall consist of an original live recording. The recording shall contain the narrative commentary of the electrographer, recorded simultaneously with his fixed elevation video record of the zone of influence of construction.
- F. Recorded Information - Video: All video recordings must, by electronic means, display continuously and simultaneously, generated with the actual taping, transparent digital information to include the date and time of recording. The date information shall contain the month, day and year. The time information shall contain the hours, minutes, and seconds. Additional information shall be displayed periodically. Such information shall

include, but not be limited to, project name, bid package number, process structure or area, and the viewing side. This transparent information shall appear on the extreme upper left hand third of the screen.

- G. Conditions for Taping: All taping shall be done during times of good visibility. No taping shall be done during precipitation, mist or fog. The recording shall only be done when sufficient sunlight is present to properly illuminate the subjects of recordings and to produce bright, sharp video recordings of those subjects.
- H. Tape Coverage: Tape coverage shall include all surface features located within the zone of influence of construction supported by appropriate audio coverage. Such coverage shall include, but not be limited to, existing road, driveways, sidewalks, curbs, pavement, landscaping, fences, signs and interior and exterior of existing structures affected by the work and the exteriors of structures adjacent to the work, and any other on-site area that will be occupied or impacted by the CONTRACTOR or any of his subcontractors or suppliers within the area covered.

1.11 PAYMENT APPLICATION GUIDELINES

- A. The deadline to turn in the monthly payment application is 25th of each month. The following backup documents must be included in the monthly payment applications:
 - 1. Consent of Surety or Release of Liens, with a corresponding letter verifying signatory authority of signer
 - 2. Updated progress schedule
 - 3. Current, valid, Certificate of Insurance
 - 4. Scanned Daily Reports
 - 5. Progress As-Builts
- B. It is also recommended that contractors submit a red-line pay application, before the 5th of each month, wherein contractor quantities and percent completion (as measured against the schedule of values) can be proposed, and verified or countered by City.
- C. If there is no action for the work order, please submit City's project manager an e-mail stating no action on that particular month.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

**** END OF SECTION ****

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SECTION 01 40 00
TESTING AND INSPECTION

PART 1 - GENERAL

1.01 DESCRIPTION

- A. All testing and inspection will be in accordance with Article 12 of the General Conditions.
- B. Each NF unit shall be flushed, disinfected, and leak tested following replacement of the membrane element pressure vessels, but before loading of the membrane elements. The OWNER will employ and pay for the services of an independent testing laboratory to perform bacteriological sampling (two consecutive samples 24 hours apart) of each NF unit immediately following completion of the membrane pressure vessels and leak testing of the units, and prior to loading of the membrane elements. Following satisfactory bacteriological clearance, the CONTRACTOR may proceed with replacement of the membrane elements. The OWNER may at any other time elect to have materials and equipment tested for conformity with the Contract Documents.
 - 1. CONTRACTOR shall notify the OWNER when each NF unit is ready for bacteriological sampling, and shall cooperate with the laboratory to facilitate the execution of its required services.
 - 2. Employment of the laboratory shall in no way relieve CONTRACTOR's obligations to perform the Work of the Contract.
- C. The OWNER will not employ or pay for laboratory services associated with the water quality sampling and analyses required for the membrane system performance acceptance testing specified in Section 46 63 11. CONTRACTOR shall be responsible for all system monitoring and laboratory analytical services associated with the performance acceptance testing specified in Section 46 63 11.
- D. The work or actions of the testing laboratory shall in no way relieve the CONTRACTOR of his obligations under the Contract. The laboratory testing work will include such inspections and testing required by the Contract Document, existing laws, codes, ordinances, etc. The testing laboratory will have no authority to change the requirements of the Contract Documents, nor perform or approve any of the CONTRACTOR'S work.
- E. The CONTRACTOR shall furnish the services of representatives of the manufacturers of certain equipment, as prescribed in other sections of the Specifications. The CONTRACTOR shall also place his orders for such equipment on the basis that, after the equipment has been tested prior to final acceptance of the work, the manufacturer will furnish to the CITY the certified statements that the equipment has been installed properly and is ready to be placed in functional operation. Tests and analyses required of equipment shall be paid for by the CONTRACTOR, unless specified otherwise in the section which covers a particular piece of equipment.
- F. The CITY will bear the cost of all additional tests, inspections, or investigations undertaken by the order of the ENGINEER for the purpose of determining conformance with the Contract Documents if such test, inspection, or investigations are not specifically required by the Contract Documents, and if conformance is ascertained thereby. Whenever nonconformance is determined by the ENGINEER as a result of such test,

inspections, or investigations, the CONTRACTOR shall bear the full cost thereof or shall reimburse the CITY for said cost. The cost of any additional tests and investigations, which are ordered by the ENGINEER to ascertain subsequent conformance with the Contract Documents, shall be borne by the CONTRACTOR.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

**** END OF SECTION ****

SECTION 01 41 00
CONTRACTOR'S HEALTH AND SAFETY PLAN

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope

1. This Section describes CONTRACTOR's responsibilities for a written site-specific health and safety plan (SSHP). CONTRACTOR shall conduct all construction activities in a safe manner so as not to result in:
 - a. injuries to employees, Subcontractors or other persons with an interest at or near the Site;
 - b. employee exposures to health hazards above the occupational limits established by the Occupational Health and Safety Administration (OSHA), the American Conference of Governmental Industrial Hygienists (ACGIH), or the Nuclear Regulatory Commission (NRC);
 - c. exposure of area residents to air contaminants above the levels established for general public exposure by the Environmental Protection Agency (EPA), NRC, or the State in which the Project is located;
 - d. significant increases in the levels of contaminants in soil, water, or sediment near the Site; or
 - e. violations of OSHA, or other Laws or Regulations.

- B. Any disregard of the provisions of the SSHP may, without limitation, be deemed just and sufficient reason for termination of CONTRACTOR's services for cause.

1.02 QUALITY ASSURANCE

A. Qualifications

1. Engage an industrial hygienist certified by the American Board of Industrial Hygiene or a safety professional certified by the Board of Certified Safety Professionals to prepare or supervise the preparation of the SSHP.
2. Submit qualifications along with SSHP.

- B. Regulatory Requirements: CONTRACTOR's health and safety practices shall follow the standards and guidelines established in the following:

1. 29 CFR 1904, OSHA, Record Keeping.
2. 29 CFR 1910, OSHA, General Industry Standards.
3. 29 CFR 1926, OSHA, Construction Industry Standards.
4. 29 CFR 1926.65, OSHA, Hazardous Waste Operations and Emergency Response.
5. 49 CFR 171.8, DOT, Hazardous Materials in Transport.
6. 40 CFR Parts 261.3, 264 and 265, EPA, Resource Conservation and Recovery Act.
7. 29 CFR 1910.146, OSHA, Permit-Required Confined Spaces.
8. 29 CFR 1926.1101, OSHA, Asbestos

1.03 SUBMITTALS

- A. Submit to ENGINEER the following:
 - 1. CONTRACTOR's SSHP.
 - 2. Qualifications of industrial hygienist or safety professional.
 - 3. Health and safety reports.
 - 4. Accident reports.

PART 2 - GENERAL

2.01 GENERAL PROVISIONS

- A. Submit SSHP to ENGINEER one week prior to the Preconstruction Conference, or 30 days prior to planned mobilization at the Site, whichever is sooner.
- B. The SSHP shall bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR's obligations under the Contract Documents with respect to CONTRACTOR's review and approval of the SSHP.
- C. ENGINEER will review and either accept or return for revision CONTRACTOR's SSHP in accordance with the Schedule of Submittals acceptable to ENGINEER. ENGINEER's review and acceptance will be only to determine if the topics covered by the SSHP conform to the Contract Documents.
- D. ENGINEER's review and acceptance will not extend to means, methods, techniques, procedures of construction, or to whether the representations made in the SSHP comply with regulatory standards or standards of good practice.
- E. At the time of submittal, CONTRACTOR shall give ENGINEER specific written notice of variations, if any, that the SSHP may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the submittal; and, in addition, by a specific notation made on each submittal to ENGINEER for review and acceptance of each such variation.
- F. No Work shall be performed on the Site until the written SSHP has been accepted by the ENGINEER.
- G. Notwithstanding any other provision of the Contract Documents, extensions to the Contract Times will not be granted if caused by undue delay by CONTRACTOR in developing or revising the SSHP.

2.02 WRITTEN HEALTH AND SAFETY PROGRAM

- A. The SSHP, which shall be kept on the Site, shall address the safety and health hazards of each phase of operations on the Site and include the requirements and procedures for employee protection. The SSHP as a minimum, shall address and include the following:
 - 1. The organizational structure of CONTRACTOR's organization.
 - 2. A comprehensive work plan.
 - 3. A safety and health risk or hazard analysis for each task and operation found in the work plan.

4. Employee training assignments including copies of 40-hour, 24-hour Supervised Field Activities, 8-hour Supervisors, and 8-hour Refresher Training Certificates for all CONTRACTOR's employees assigned to the Project.
 5. Personal protective equipment to be used by employees for each of the tasks and operations being conducted. Respirator fit test certificates for all CONTRACTOR employees assigned to the Project.
 6. Medical Surveillance Requirements: Medical clearance certificates for all CONTRACTOR's employees assigned to the Project.
 7. Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment.
 8. Site control measures for purposes, including but not limited to:
 - a. preventing trespassing;
 - b. preventing unqualified or unprotected workers from entering restricted areas;
 - c. preventing tracking of contaminants out of the Site;
 - d. maintaining log of employees on and visitors to the Site;
 - e. delineating hot, cold and support zones;
 - f. locating personnel and equipment decontamination zones; and
 - g. communicating routes of escape and gathering points.
 9. Decontamination procedures.
 10. An emergency response plan for safe and effective responses to emergencies, including the necessary PPE and other equipment.
 11. Confined space entry procedures (if applicable).
 12. A spill containment program.
- B. Organizational Structure
1. The organizational structure part of the SSHP shall refer to or incorporate information on the specific chain of command and specify the overall responsibilities of supervisors and employees, and shall include, at a minimum, the following elements:
 - a. designation of a general supervisor who has the responsibility and authority to direct all hazardous waste operations.
 - b. a Site safety and health supervisor who has the responsibility and authority to implement and modify the SSHP and verify compliance.
 - c. all other personnel needed for hazardous waste Site operations and emergency response and their general functions and responsibilities.
 - d. The lines of authority, responsibility, and communication.
 2. The organizational structure shall be reviewed and updated as necessary to reflect the current status of Site operations.
- C. Work Plan
1. The comprehensive work plan part of the SSHP shall refer to or incorporate information on the following:
 - a. The tasks and objectives of the Site operations and the logistics and resources required to achieve those tasks and objectives.

- b. The anticipated activities as well as the CONTRACTOR's normal operating procedures.
 - c. The personnel and equipment requirements for implementing the work plan.
- D. The SSHP shall include procedures that will be used to ensure safe waste handling during the excavating, handling, loading, and transporting activities.

2.03 ACCIDENT REPORTING AND INVESTIGATION

- A. Document all accidents resulting in bodily injury using OSHA 301 form.
- B. Submit copies of completed OSHA 301 forms to the ENGINEER weekly.
- C. Based upon the results of an accident investigation, make modifications to the SSHP by changing tasks or procedures to prevent a reoccurrence.
- D. Post a copy of CONTRACTOR's OSHA 300A report in a conspicuous place onsite.

2.04 DAILY HEALTH AND SAFETY FIELD REPORTS

- A. Submit to ENGINEER daily health and safety field reports including, but not limited to, weather conditions, delays encountered in construction, and acknowledgment of deficiencies noted along with corrective actions taken on current and previous deficiencies. In addition, the daily health and safety air monitoring results, documentation of instrument calibration, new hazards encountered, and PPE utilized shall be included.
- B. The daily health and safety field reports shall include a description of problems, real or anticipated, encountered during the course of Work that should be brought to the attention of the ENGINEER and notification of deviations from planned Work shown in the previously submitted daily health and safety field report(s).

PART 3 - EXECUTION (NOT USED)

****END OF SECTION ****

SECTION 01 45 00
CONTRACTOR QUALITY CONTROL

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section specifies administrative and procedural requirements for quality control services, field inspections and field testing of civil and structural constructs required for this project.
- B. The Contractor is responsible for the quality assurance and quality control of their respective work for the construction of this project in accordance with the Contract Documents.

1.02 RELATED SECTIONS

- A. This section contains specific references to the following related section. Additional related sections may apply that are not specifically listed below.
 - 1. Section 01 40 00 Testing and Inspection Services

1.03 DEFINITIONS

- A. Quality Control System (QCS): The quality control, assurance, and inspection system established and carried out to ensure compliance with the Plans and specifications.
- B. QCS Supervisor: That person in responsible charge of the work occurring, as designated by the Contractor in the QCS Plan.
- C. QCS Inspector: Responsible, certified personnel inspecting the various constructs at specified milestones and during the project overall and designated by the Construction Manager.
- D. Factory Test: Tests made on various materials, products and component parts prior to shipment to the job site.
- E. Field Tests: Tests and analyses made at or in the vicinity of the job site in connection with the actual construction.
- F. Certified Inspection Report: Reports signed by approved inspectors attesting that the items inspected meet the specification requirements other than any exceptions included in the report.
- G. Certificate of Compliance: Certificate from the manufacturer of the material or equipment identifying said manufacturer, product and stating that the material or equipment meet specified standards, and shall be signed by a designated officer of the manufacturer.
- H. Standard Compliance: Condition whereby specified materials or equipment must conform to the standards of organizations such as the American National Standard Institute (ANSI), American Society for Testing and Materials (ASTM), Underwriters Laboratories (UL) or similar organization.

- I. Quality Assurance: The day-to-day, in-process supervisory observations of work and materials conducted by the Contractor to assure that the proper methods and materials are being used and installed by tradesmen.
- J. Source Quality Control: The in-process testing and inspections conducted by the QCS Inspector(s) to verify that the materials, equipment; workmanship and shop manufactured constructs are in compliance with the Contract Documents, applicable Codes and standards.
- K. Field Quality Control: The testing and inspections conducted by the QCS Inspector(s) in the field during and at the completion of each construct to verify that the in-process and completed construction is in compliance with the Contract Documents, applicable Codes and standards.
- L. Special Inspector – A qualified individual employed or retained by an approved agency and approved by the local governing authorities having jurisdiction (AHJ) as having the competency necessary to inspect a particular type of construction requiring special inspection.

1.04 SUBMITTALS

A. Action Submittals:

1. Procedures: Section 01 33 00.
2. A copy of this specification section with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements.
3. Check-marks (✓) denote full compliance with a paragraph as a whole. Deviations shall be underlined and denoted by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined signify compliance with the specification. Include a detailed, written justification for each deviation. Failure to include a copy of this marked-up specification section, along with justification(s) for requested deviations, with the submittal, is cause for rejection of the entire submittal with no further consideration.
4. Written description of Contractor's proposed QCS plan in sufficient detail to illustrate adequate measures for verification and conformance to defined requirements. The QCS plan and submittal shall include a log showing anticipated inspections, QCS Inspectors, Special Inspections, and source and field Quality Assurance procedures. Submittal of the QCS plan shall be made prior to commencing field work.
5. Contractor's proposed QCS Supervisor and QCS Inspectors (other than the Special Inspectors provided by City), including qualifications, responsibilities, and if requested, references.
6. Complete structural system information describing Contractor designed structural systems, including sealed calculations, shop and erection drawings, product literature for the various components, International Code Council (ICC) Evaluation Reports for structural components, and a discussion of risk issues associated with the proposed system which could adversely impact overall project completion.
7. If requested by the Construction Manager during the work, manufacturer's field services and reports.

A. Informational Submittals:

1. Procedures: Section 01 33 00.
2. Manufacturers' field services and reports unless requested by Construction Manager to be submitted for review.
3. Special Inspection reports, unless otherwise directed in each technical specification Section.

1.05 REGULATORY REQUIREMENTS

- A. **GENERAL:** Comply with all Federal, State, and local Codes as referenced herein. Such regulations apply to activities including, but not limited to, site work and zoning, building practices and quality, on and offsite disposal, safety, sanitation, nuisance, and environmental quality.
- B. **SPECIAL INSPECTION:** Special Inspection shall be performed by the Special Inspector under contract with the City or registered design professional in responsible charge acting as the City's agent in conformance with the IBC. Special Inspection is in addition to, but not replacing, other inspections and quality control requirements herein. Where sampling and testing required herein conforms to Special Inspection standards, such sampling and testing need not be duplicated.
- C. **STRUCTURAL OBSERVATION:** Registered Design Professional shall make visual inspections of the work to assess general conformance with the Contract Documents at significant construction stages and at completion of the structural system in accordance with IBC 1704.6 Structural Observations requirements.

1.06 CONTRACTOR'S RESPONSIBILITIES

- A. Monitor quality assurance over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Coordinate with, schedule specified inspections by, and provide normal and customary assistance to the QCS Inspectors and City provided Special Inspectors.
- C. Coordinate with, schedule specified structural observations by Engineer, and provide normal and customary assistance to Engineer performing structural observations.
- D. Comply fully with manufacturers' instructions, including each step in sequence.
- E. Should manufacturers' instructions conflict with Contract Documents, request clarification before proceeding from Construction Manager.
- F. Comply with specified standards as a minimum quality for the work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- G. The Contractor shall retain the services of a licensed land surveyor, registered in the State of Florida, to perform survey work including but not limited to establishing line and grade, in advance of the construction; and to perform other surveying services for the work included under the Contract. The surveyor to be retained by the Contractor shall not be the same surveyor engaged for the Engineer's use. The surveyor shall be subject

to the approval of the Engineer. Survey drawings shall be submitted to the Engineer for approval.

- H. The Contractor shall take all necessary measurements in the field to verify pertinent data and dimensions shown on the Drawings or to determine the exact dimensions of the Work.

1.07 FIELD SAMPLE PROCEDURES

- A. When field samples are specified in a unit of work, construct each field sample to include work of all trades required to complete the field sample prior to starting related field work. Field samples may be incorporated into the project after acceptance by Construction Manager. Remove unacceptable field samples when directed by Construction Manager. Acceptable samples represent a quality level for the work.

1.08 CONTRACTOR DESIGNED STRUCTURAL SYSTEMS

- A. DESIGN ENGINEERING: Contractor shall employ and pay for engineering services from a Professional Engineer registered in the State of Florida for structural design of Contractor designed structural systems including but not limited to temporary shoring and bracing, formwork support, interior wall and ceiling systems, and support systems for fire sprinkler, plumbing, mechanical, and electrical systems and equipment.
- B. TESTS AND INSPECTIONS OF CONTRACTOR DESIGNED STRUCTURAL SYSTEMS: Contractor shall pay for preliminary testing of concrete, grout, and mortar mix designs where required by Code or these specifications prior to start of work. Contractor shall pay for required shop and site inspection of Contractor designed structural systems where required by Code or these specifications.

1.09 JOB SITE CONDITIONS

- A. Schedule to ensure all preparatory work has been accomplished prior to proceeding with current work. Proceeding with the work constitutes acceptance of conditions. Allow adequate time for materials susceptible to temperature and humidity to “stabilize” prior to installation. Establish and maintain environmental conditions (i.e., temperature, humidity, lighting) as recommended by the various material manufacturers for the duration of the work.

PART 2 - PRODUCTS

2.01 SOURCE QUALITY CONTROL

- A. CONTRACTOR RESPONSIBILITIES: Provide source quality control according to the reviewed and accepted QCS plan and paragraph 1.06 herein. Coordinate with Construction Manager to facilitate the work of the Testing Laboratory specified in Section 01 45 23 and Special Inspector. Provide ready access to sampling and inspection locations and incidental labor customary in such sampling and inspections. Timely prepare and submit submittals, and revise as indicated by review comments. Comply with technical requirements in each specification Section that applies to the work.
- B. CONSTRUCTION MANAGER RESPONSIBILITIES: Review Contractor’s tracking of QCS activities at [monthly] meetings. Facilitate completion of submittal review per Section 01

33 00. Assist Contractor to ensure that Special Inspection occurs where and when specified.

- C. ACCEPTANCE CRITERIA: Acceptable characteristics and quality of a particular item or construct is defined in that item's or construct's specification Section.

PART 3 - EXECUTION

3.01 FIELD QUALITY CONTROL

- A. Field quality control responsibilities of the Contractor and Construction Manager are substantially the same as described in paragraph 2.01, with the exception that this work occurs primarily on the jobsite as the work progresses, and Special Inspection will occur more often than at the source.
- B. Acceptable characteristics and quality of a particular item or construct is defined in that item's or construct's specification Section.

3.02 REGULATORY COMPLIANCE – SPECIAL INSPECTIONS

- A. The types of work requiring Special Inspection are specified in the Construction Documents and required to obtain regulatory approval by State or required by local governing authorities having jurisdiction over the building permit of the project.
- B. Section 01 45 23 describes Testing Laboratory sampling, testing and reporting.
- C. Contractor designed structural systems are subject to the same Special Inspection requirements as all other work.

3.03 CORRECTION OF DEFECTIVE WORK

- A. Any defective or imperfect Work, equipment, or materials furnished by the Contractor which is discovered before the Final Acceptance of the Work, or during a warranty period, shall be removed immediately even though it may have been overlooked by the Engineer and approved for payment. The Contractor shall repair such defect, without compensation, in a manner satisfactory to the Engineer.
- B. Unsuitable materials and equipment may be rejected, notwithstanding that such defective Work, materials and equipment may have been previously overlooked by the Engineer and accepted or approved for payment.
- C. If any workmanship, materials or equipment shall be rejected by the Engineer as unsuitable or not in conformity with the Specifications or Drawings, the Contractor shall promptly replace such materials and equipment with acceptable materials and equipment at no additional cost to City . Equipment or materials rejected by the Engineer shall be tagged as such and shall be immediately removed from the site.
- D. The Engineer may order tests of imperfect or damaged Work equipment, or materials to determine the required functional capability for possible acceptance, if there is no other reason for rejection. The cost of such tests shall be borne by the Contractor, and the nature, tester, extent and supervision of the tests will be as determined by the Engineer. If the results of the tests indicate that the required functional capability of the Work,

equipment, or material was not impaired, the Work, equipment or materials may be deemed acceptable, in the discretion of the Engineer. If the results of such tests reveal that the required functional capability of the questionable Work, equipment or materials has been impaired, then such Work, equipment or materials shall be deemed imperfect and shall be replaced. The Contractor may elect to replace the imperfect Work, equipment or material in lieu of performing the tests.

**** END OF SECTION ****

SECTION 01 52 00

MAINTENANCE OF FACILITIES AND SEQUENCE OF CONSTRUCTION

PART 1 - GENERAL

1.01 GENERAL

- A. The CONTRACTOR shall ensure the continuous operation of The City of Hollywood's Water Treatment Plant during construction. Portions of the existing nanofiltration membrane process will be removed from service to accomplish the work as specified herein. In performing the work shown and specified, the CONTRACTOR shall plan and schedule CONTRACTOR'S work as outlined in this Section.

1.02 CONSTRUCTION SCHEDULE

- A. The Construction Schedule shall be submitted by the CONTRACTOR in accordance with Section 01 33 00 of these Specifications.

1.03 USE OF FACILITIES BEFORE COMPLETION

- A. The CITY reserves the right to enter and use any portion of the constructed facilities before final completion of the whole work to be done under this Contract in accordance with Article 14-2, Partial Utilization of the General Conditions.

1.04 CONNECTION OF EXISTING SYSTEMS

- A. All connections to existing systems shall be performed in such a manner that no damage and minimal interruption is caused to the existing installation. On completion of its installation, the CONTRACTOR shall complete the connection to the existing systems in a proper manner. Any damage caused to existing installations shall be repaired or replaced by the responsible CONTRACTOR at no additional cost to the CITY.
- B. The CONTRACTOR shall note that some of the work in this contract will require the CONTRACTOR to connect to existing pipelines and structures. The CONTRACTOR shall be responsible for the proper containment and disposal of wastewater or other materials drained from existing pipelines and structures during construction, unless otherwise specifically noted to be performed by the CITY.

1.05 COORDINATION WITH UTILITIES PERSONNEL

- A. Before commencing work involving removing or placing in operation existing or new facilities or tie-ins to existing facilities, the CONTRACTOR shall notify the CITY at least ten (10) business days in advance in writing. The CITY shall be responsible for removing facilities from operation as deemed necessary.
- B. The CONTRACTOR shall, under no circumstances, interfere with wastewater treatment plant and existing potable water, sewer and stormwater facilities without the CITY's authorization, in writing, and supervision. The CONTRACTOR shall notify the CITY's representative in writing a minimum of three work days prior to each scheduled service

request. This notification shall be provided on the CITY's standard form, or on an approved equivalent form completed in full by the CONTRACTOR.

1.06 GENERAL SEQUENCE OF CONSTRUCTION AND OPERATION REQUIREMENTS

- A. Work under the Contract shall be scheduled and performed in such a manner as to result in the least possible disruption to the operation of the treatment plant.
- B. In general, the Work under this Contract shall be completed between the City's normal working hours, 8:00 am through 5:00 pm Monday through Friday. Critical tasks of work that have the potential to affect operating of the water treatment plant (such as removing an NF unit from service or placing an NF unit back into service after replacement of the pressure vessels and membrane elements) shall only be undertaken during the first three days (Monday, Tuesday, or Wednesday) of the week, and not within two days prior to a holiday.
- C. The outlined sequence of construction does not include all items necessary to complete the work, but is intended to identify the sequence of critical events necessary to minimize any disruptions to the existing treatment process. It shall be understood by the CONTRACTOR that the critical events identified are not all inclusive and that additional items of work not shown may be required. The sequence of construction is a precedence requirement and does not attempt to schedule the CONTRACTOR' work. It is intended only to indicate which activities must precede other activities in order to minimize interference's and disruptions.
- D. All work by the CONTRACTOR that disrupts the normal treatment plant operations shall be shown on the Construction Schedule specified in Section 01 33 00 and specifically scheduled with the CITY. Schedule notification shall consist of a written notice defining the work to be accomplished, the normal treatment plant that will be interrupted, the duration of the interruption, and the mitigating effort to be performed by the CONTRACTOR. The written notice shall be submitted to the CITY ten days in advance of the proposed work and the CITY will respond to the CONTRACTOR in writing within five days of receipt of the notice regarding the acceptability of the proposed plan.
- E. At no time, the CONTRACTOR shall undertake closing off any pipelines, or opening valves, or take any other action which would affect the operation of the existing system, except as specifically required by the drawings and specifications, and until authorization is granted by the CITY or ENGINEER and after proper notification.
- F. Temporary installations required to complete a particular aspect of the work during the allowed time period shall be determined by the CONTRACTOR and implemented by the CONTRACTOR at no additional cost to the CITY. All such temporary installations shall be subject to the review and acceptance of the ENGINEER.
- G. The Contractor shall be responsible for supporting and protecting existing utilities as required to complete the Work.
- H. The CONTRACTOR shall fully comply with all requirements of the Permits, at no additional cost to the CITY. Working hours noted in permits or the Specifications are subject to change. In the event that changed working hours affect the Contractor's work, the Contractor's sole remedy shall be a non-compensable time extension. Said extension to

be full compensation for all direct and indirect costs, including but not limited to loss of efficiency, loss of opportunity, increased bond or insurance premiums, or home office or extended overhead, incurred by the Contractor as a result of such change, and no additional compensation shall be considered. Night work may be required as a part of the project.

- I. Sequence of certain major events and identification of time constraints for removing existing facilities from active service and installation of new facilities are described below in paragraph 1.07. No phase of work (or tasks within a phase) shall preclude or be performed in parallel with a subsequent phase unless specifically defined so in these documents. In all cases, work in each phase shall be checked out and accepted for satisfactory use, subject to the ENGINEER's approval, prior to the CONTRACTOR proceeding to the next phase of construction.

1.07 DETAILED SEQUENCE OF CONSTRUCTION AND OPERATION REQUIREMENTS

- A. Only one (1) NF membrane unit may be taken out of service at a time due to the CONTRACTOR's work. The remaining units must remain operational.
- B. Following delivery to the site of the pressure vessels, accessories, and each shipment of membrane elements, and all equipment and materials needed to complete the pressure vessel and membrane element replacement for each membrane unit, the CONTRACTOR will be allowed to take one membrane unit out of service at a time to complete the work on each unit. All work shall be complete, and the membrane unit shall be re-loaded with membrane elements, leak tested, and started up and tested for a minimum of three days of satisfactory operation before another membrane unit may be taken out of service to begin work on that unit. A more detailed description of the required manufacture delivery, loading, and start-up schedule is provided in Division 13. Work shall be sequenced so as to achieve the contract milestones set forth in the Conditions of the Contract within the Contract Times specified in the Agreement.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 COORDINATION WITH EXISTING UTILITIES AND OTHER AGENCIES – NOT USED

3.02 COOPERATION

- A. The CONTRACTOR shall allow the CITY or its agents, and other project contractors or their agents, to enter facilities being constructed under this Contract for the purpose of constructing, installing, operating, maintaining, removing, repairing, altering or replacing such equipment pipes, sewers, conduits, manholes, wires, or other structures and appliances which may be required to be installed at or in the work. The CONTRACTOR shall cooperate with all the aforesaid parties and shall allow reasonable provisions for the prosecution of any other work by the CITY, or others, to be done in connection with CONTRACTOR'S work, or in connection with normal use of the facilities.

**** END OF SECTION ****

SECTION 01 53 00
PROTECTION OF EXISTING FACILITIES

PART 1 - GENERAL

1.01 THE REQUIREMENT

- A. The CONTRACTOR shall protect all existing utilities and improvements not designated for removal and shall restore damaged or temporarily relocated utilities and improvements to a condition equal to or better than they were prior to such damage or temporary relocation, all in accordance with requirements of the Contract Documents.
- B. The CONTRACTOR shall verify the exact locations and depths of all utilities shown and the CONTRACTOR shall make exploratory excavations of all utilities that may interfere with the Work. All such exploratory excavations shall be performed as soon as practicable after award of Contract and, in any event, a sufficient time in advance of construction to avoid possible delays to the CONTRACTOR'S Work. When such exploratory excavations show the utility location as shown to be in error, the CONTRACTOR shall so notify the CITY.
- C. The number of exploratory excavations required shall be that number which is sufficient to determine the alignment and grade of the utility.

1.02 RESTORATION OF FACILITIES

- A. General: All paved areas including asphaltic concrete berms cut or damaged during construction shall be replaced with similar materials and of equal thickness to match the existing adjacent undisturbed areas, except where specific resurfacing requirements have been called for in the Contract Documents or in the requirements of the agency issuing the permit. All temporary and permanent pavement shall conform to the requirements of the affected pavement CITY. All pavements which are subject to partial removal shall be neatly saw cut in straight lines.
- B. Temporary Restoration: Temporary restoration includes repair to all driveways, sidewalks and roadways. They shall be swept clean and be maintained free of dirt and dust. All areas disturbed by the construction activities shall be restored to proper grade, cleaned up, including the removal of debris, trash, and deleterious materials. All construction materials, supplies, or equipment, including piles of debris shall be removed from the area. All temporarily restored areas shall be maintained by the CONTRACTOR. These areas shall be kept clean and neat, free of dust and dirt, until final restoration operations are completed. The CONTRACTOR is responsible to utilize dust abatement operations in the temporarily restored areas as required, to the satisfaction of the ENGINEER.
- C. Temporary Resurfacing: Wherever required by the public authorities having jurisdiction, the CONTRACTOR shall place temporary surfacing promptly after backfilling and shall maintain such surfacing for the period of time fixed by said authorities before proceeding with the final restoration and improvements.
- D. Permanent Resurfacing: In order to obtain a satisfactory junction with adjacent surfaces, the CONTRACTOR shall saw cut back and trim the edge so as to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of

pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with adjacent undisturbed pavement, unless otherwise shown on the drawings.

- E. Final Restoration: Final restoration shall include the completion of all required pavement replacement of roadways, driveways, curbs, gutters, sidewalks and other existing improvements disturbed by the construction: final grading, placement of sod, installation or replacement of any trees or shrubs, repair of irrigation systems, pavement markings, etc., all complete and finished, acceptable to the ENGINEER.

1.03 EXISTING UTILITIES AND IMPROVEMENTS

- A. General: The CONTRACTOR shall protect all underground utilities and other improvements which may be impaired during construction operations. It shall be the CONTRACTOR'S responsibility to ascertain the actual location of all existing utilities and other improvements that will be encountered in its construction operations, and to see that such utilities or other improvements are adequately protected from damage due to such operations.
- B. Utilities to be Moved: In case it shall be necessary to move the property of any public utility or franchise holder, such utility company or franchise holder will, upon request of the CONTRACTOR, be notified by the CITY to move such property within a specified reasonable time. When utility lines that are to be removed are encountered within the area of operations, the CONTRACTOR shall notify the CITY a sufficient time in advance for the necessary measures to be taken to prevent interruption of service.
- C. Where the proper completion of the Work requires the temporary or permanent removal and / or relocation of an existing utility or other improvement which is shown, the CONTRACTOR shall remove and temporarily replace or relocate such utility or improvement in a manner satisfactory to the CITY and the OWNER of the utility/facility. In all cases of such temporary removal or relocation, restoration to former location shall be accomplished by the CONTRACTOR in a manner that will restore or replace the utility or improvement as nearly as possible to its former locations and to as good or better condition than found prior to removal.
- D. CITY'S Right of Access: The right is reserved to the CITY and to the OWNER'S of public utilities and franchises to enter at any time upon any public street, alley, right-of-way, or easement for the purpose of making changes in their property made necessary by the Work of this Contract.
- E. Underground Utilities Shown or Indicated: Existing utility lines that are shown or the locations of which are made known to the CONTRACTOR prior to excavation and that are to be retained, and all utility lines that are constructed during excavation operations shall be protected from damage during excavation and backfilling and, if damaged, shall be immediately repaired by the CONTRACTOR.
- F. Underground Utilities Not Shown or Indicated: In the event that the CONTRACTOR damages any existing utility lines that are not shown or the locations of which are not made known to the CONTRACTOR prior to excavation by the CITY and Sunshine One-Call Notification, a written report thereof shall be made immediately to the CITY. The

CONTRACTOR shall make the repairs immediately under the provisions for changes and extra work contained in the General Conditions.

- G. Approval of Repairs: All repairs to a damaged improvement are subject to inspection and approval by an authorized representative of the CITY before being concealed by backfill or other Work.
- H. No fill, excavation material, construction generated debris or equipment shall obstruct water valves, gas meters or sewer manholes. Water, sewer and gas service shall be made accessible to repair or maintenance crews representing the CITY or a privately-owned utility company.
- I. Maintaining in Service: All oil and gasoline pipelines, power, and telephone or other communication cable ducts, gas and water mains, irrigation lines, reuse lines, sewer lines, storm drain lines, poles, and overhead power and communication wires and cables encountered along the line of the Work shall remain continuously in service during all the operations under the Contract, unless other arrangements satisfactory to the CITY are made with the owner of said utilities. The CONTRACTOR shall be responsible for and shall repair all damage due to its operations, and the provisions of this Section shall not be abated even in the event such damage occurs after backfilling or is not discovered until after completion of the backfilling.

1.04 TREES WITHIN STREET RIGHTS-OF-WAY AND PROJECT LIMITS

- A. If any tree removal or relocation is required, the CONTRACTOR needs to coordinate with the ENGINEER, accordingly. All required permits related to tree removal are the responsibility of the CONTRACTOR.
- B. Appendix D shows the Tree Survey provided for this project. The CONTRACTOR shall familiarize him/herself with this document to determine the location of existing protected vegetative species within the project site.
- C. Trimming or removal of existing protected vegetative species shall be coordinated with ENGINEER. The CONTRACTOR shall be responsible for permits needed to trim or remove this vegetation with Broward County and the City of Hollywood Building Department.
- D. Refer to Section 01 74 00 for permits obtained for this project. The CONTRACTOR shall abide by the General License issued by Broward County for protection of protected vegetative species.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

**** END OF SECTION ****

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SECTION 01 70 00
PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 PROJECT CLOSEOUT

- A. As construction of the project enters the final stages of completion, the CONTRACTOR shall, in accordance with the requirements set forth in the Contract Documents, attend to or have already completed the following items:
1. Scheduling start-up and initial operation.
 2. Correcting or replacing defective work, including completion of items previously overlooked or work which remains incomplete, all as evidenced by the CITY's "Punch" lists.
 3. Make final submittals.
 4. Attend to any other items listed herein or brought to the CONTRACTOR's attention by the CITY.

1.02 CLOSEOUT TIMETABLE

- A. The CONTRACTOR shall establish dates for equipment testing, acceptance periods, and on-site instructional periods (as required under the Contract). Such dates shall be established not less than one week prior to beginning any of the foregoing items, to allow the CITY, the ENGINEER, and their authorized representatives sufficient time to schedule attendance at such activities.

1.03 FINAL SUBMITTALS

- A. Before the acceptance of the project major milestones for substantial completion, the CONTRACTOR shall submit to the ENGINEER (or to the CITY if indicated) certain records, certifications, etc., which are specified elsewhere in the Contract Documents. Missing, incomplete or unacceptable items, as determined by the ENGINEER or the CITY, shall indicate non-compliance with substantial completion major milestone dates. A partial list of such items appears below, but it shall be the CONTRACTOR'S responsibility to submit any other items which are required in the Contract Documents:
1. Written Test results of project components.
 2. Performance affidavits for equipment and materials.
 3. Operation and Maintenance Manuals for equipment.
 4. Record Drawings: during the entire construction operation, the CONTRACTOR shall maintain records of all deviations from the Drawings and Specifications and shall prepare therefrom record drawings showing correctly and accurately all changes and deviations from the Work made during construction to reflect the Work as it was actually constructed. These drawings shall conform to recognized standards of drafting, shall be neat, legible and on mylar or other reproducible material acceptable to the ENGINEER.
 5. Written guarantees, where required.
 6. Certificates of inspection and acceptance by local governing agencies having jurisdiction.

7. Releases from all parties who are entitled to claims against the subject project, property, or improvement pursuant to the provisions of law.

1.04 PUNCH LISTS

- A. Final cleaning and repairing shall be scheduled upon completion of the project.
- B. The ENGINEER will make his final inspection whenever the CONTRACTOR has notified the ENGINEER that the work is ready for the inspection. Any work not found acceptable and requiring cleaning, repair and/or replacement will be noted on the "Punch" list. Work that has been inspected and accepted by the ENGINEER shall be maintained by the CONTRACTOR, until final acceptance of the entire project.
- C. Whenever the CONTRACTOR has completed the items on the punch list, he shall again notify the ENGINEER that it is ready for final inspection. This procedure will continue until the entire project is accepted by the ENGINEER. The "Final Payment" will not be processed until the entire project has been accepted by the ENGINEER and all of the requirements in previous Article 1.03 "Final Submittals" have been satisfied.

1.05 MAINTENANCE AND GUARANTEE

- A. The CONTRACTOR shall comply with all maintenance and guarantee requirements of the Contract Documents.
- B. Replacement of earth fill or backfill, where it has settled below the required finish elevations, shall be considered as a part of such required repair work, and any repair or resurfacing constructed by the CONTRACTOR which becomes necessary by reason of such settlement shall likewise be considered as a part of such required repair work unless the CONTRACTOR shall have obtained a statement in writing from the affected private CITY or public agency releasing the CITY from further responsibility in connection with such repair or resurfacing.
- C. The CONTRACTOR shall make all repairs and replacements promptly upon receipt of written order from the CITY. If the CONTRACTOR fails to make such repairs or replacements promptly, the CITY reserves the right to do the Work and the CONTRACTOR and CONTRACTOR'S surety shall be liable to the CITY for the cost thereof.

1.06 TOUCH-UP AND REPAIR

- A. The CONTRACTOR shall touch-up and repair damage to all field painted and factory finished equipment. Touch-up of equipment panels, etc., shall match as nearly as possible the original finish. If in the opinion of the ENGINEER the touch-up work is not satisfactory, the CONTRACTOR shall repaint the item.

1.07 FINAL CLEANUP

- A. The CONTRACTOR shall promptly remove from the vicinity of the completed Work, all rubbish, unused materials, concrete forms, construction equipment, and temporary structures and facilities used during construction. Final acceptance of the Work by the CITY will be withheld until the CONTRACTOR has satisfactorily complied with the foregoing requirements for final cleanup of the project site.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

**** END OF SECTION ****

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SECTION 01 73 24
DESIGN REQUIREMENTS FOR
NON-STRUCTURAL COMPONENTS AND NON-BUILDING STRUCTURES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes: Minimum structural requirements for the design, anchorage, and bracing of non-structural components such as architectural/mechanical/HVAC/electrical components, equipment, or systems, and non-building structures such as tanks.
- B. The requirements of this section apply to design of the structural elements and features of equipment and to platforms/walkways that are provided with equipment or non-building structures.
- C. This section applies to non-building structures and non-structural components that are permanently attached to structures as defined below and in ASCE 7.
- D. Design and conform to criteria and design codes listed within this section. Engineering design is not required for attachments, anchorage, or bracing detailed on the Drawings or where the size of attachments, anchorage, or bracing is defined in specific technical specification sections.
- E. The following non-structural components are exempt from seismic design loading requirements of this section.
 - 1. Components in Seismic Design Category A.

1.02 RELATED SECTIONS

- A. This section contains specific references to the following related section. Additional related sections may apply that are not specifically listed below.
 - 1. Section 05 05 20 Anchor Bolts
 - 2. Section 05 50 00 Metal Fabrications

1.03 REFERENCES

- A. The references listed below are a part of this section. Where a referenced document contains references to other standards, those documents are included as references under this section as if referenced directly. In the event of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

Reference	Title
Aluminum Design Manual	Aluminum Association, Aluminum Design Manual with Specifications and Guidelines for Aluminum Structures
AAMA	American Architectural Manufacturer's Association
ACI 318	Building Code Requirements for Structural Concrete
ACI 350	Code Requirements for Environmental Engineering Concrete Structures

Reference	Title
ACI 350.3	Seismic Design of Liquid-Containing Concrete Structures
ACI 360	Specification for Structural Steel Buildings
ASCE 7	Minimum Design Loads for Buildings and Other Structures
ASTM C635	Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
ASTM C636	Installation for Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
AWS D1.1	Structural Welding Code – Steel
AWS D1.2	Structural Welding Code - Aluminum
AWS D1.6	Structural Welding Code – Stainless Steel
AWS D1.8	Structural Welding Code – Seismic Supplement
FBC	Florida Building Code with local amendments
NFPA-13	Installation of Sprinkler Systems
OSHA	U.S. Dept. of Labor, Occupational Safety and Health Administration

1.04 DEFINITIONS

- A. Structure: The structural elements of a building that resist gravity, wind, and other types of loads. Structural components include columns, posts, beams, girders, joists, bracing, floor or roof sheathing, slabs or decking, load-bearing walls, and foundations.
- B. Non-structural Components: Non-structural portions of a building include every part of the building and all its contents, except the structural portions, that carry gravity loads and that may also be required to resist effects of wind, impact, and temperature loads. Non-structural components include, but are not limited to, ceilings, partitions, windows, equipment, piping, ductwork, furnishings, lights, etc.
- C. Non-building Structures: Self-supporting structures that carry gravity loads and that may also be required to resist the effects of wind, impact, and temperature loads. Non-building structures include, but are not limited to, pipe racks, storage racks, stacks, tanks, vessels and structural towers that support tanks and vessels.

1.05 SUBMITTALS

- A. Action Submittals:
 1. Procedures: Section 01 33 00.
 2. A copy of this specification section with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements.
 3. Check-marks (✓) shall denote full compliance with a paragraph as a whole. Deviations shall be underlined and denoted by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the specifications. Include a detailed, written justification for each deviation. Failure to include a copy of the marked-up specification sections, along with justification(s) for requested deviations to specification requirements, with the submittal is sufficient cause for rejection of the entire submittal with no further consideration.

4. For structural elements of non-structural components and non-building structures required to be designed per this section, provide Drawings and design calculations stamped by a Florida licensed professional engineer qualified to perform structural engineering.
5. List of non-structural components and non-building structures requiring wind design and anchorage.
6. Shop drawings showing details of complete wind and seismic bracing and anchorage attachment assemblies including connection hardware, and embedment into concrete.
7. Shop drawings showing plans, elevations, sections and details of equipment support structures and non-building structures, including anchor bolts, structural members, platforms, stairs, ladders, and related attachments.
8. Identify interface points with supporting structures or foundations, as well as size, location, and grip of required attachments and anchor bolts. Clearly indicate who will be providing each type of attachment/anchor bolt. Equipment vendor shall design anchor bolts, including embedment into concrete, and submit stamped calculations.
9. Calculations for supports, bracing, and attachments shall clearly indicate design criteria applied. Coordinate concrete embedment calculations with thickness and strength of concrete members. Submit a tabulation of the magnitude of unfactored (service level) equipment loads at each support point, broken down by type of loading (dead, live, wind, etc.). Indicate impact factors applied to these loads in design calculations.

1.06 QUALITY ASSURANCE

A. Quality Control By City:

1. Special Inspection of non-structural components and non-building structures, and their anchorages shall be performed by the Special Inspector under contract with the City and in conformance with FBC Chapter 17. Special Inspector(s) and laboratory shall be acceptable to the City in their sole discretion. Special Inspection is in addition to, but not replacing, other inspections and quality control requirements. Where sampling and testing required conforms to Special Inspection standards, such sampling and testing need not be duplicated.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Provide materials in conformance with information shown on the Drawings and in other technical specification sections. See individual component and equipment specifications for additional requirements.

2.02 DESIGN CRITERIA

- A. Design Codes

Design	Code
Buildings/Structures:	Florida Building Code 2020 and ASCE 7-16
Reinforced concrete:	ACI 350-06 and ACI 350.3-06 for Concrete Liquid Containing Structures, ACI 318-14 for all other reinforced concrete
Structural steel:	AISC 360-10
Aluminum:	Aluminum Design Manual, Latest Edition
Welding:	AWS Welding Codes, Latest Edition
Occupational health and safety requirements:	OSHA

Note: When conflicting requirements occur, the most stringent requirements will govern the design.

B. Design Loads

1. Design non-structural components and non-building structures for the following minimum loads: (Do not apply wind loads to non-structural components and non-building structures that are located inside buildings.)
2. Dead Loads:
 - a. Add an additional allowance for piping and conduit when supported and hung from the underside of equipment and platforms.
 - b. Typical allowance for piping and conduit: 20 psf
3. Uniform Live Loads:

Elevated grating floors:	100 psf
Columns:	No column live load reduction allowed
Exitways, stairs and landings:	100 psf
Equipment platforms, walkways/catwalks (other than exitways):	100 psf
Utility bridges:	75 psf per level

4. Snow Loads:

Code:	FBC 2020 & ASCE 7
Risk Category:	IV
Ground Snow Load (p_g):	0 psf

5. Wind Loads:

Code:	FBC 2020 & ASCE 7-16
Risk Category:	IV
Basic Wind Speed (Ultimate, 3-second gust) for Risk Category Shown Above:	185 mph
Exposure:	C
Topographic Factor (K_{zt})	1.0

Note:

1. Design exterior non-structural components and non-building structures, unless located in a pit or basin, to withstand design wind loads without consideration of shielding effects by other structures.
2. Facility is in a wind-borne debris region.
3. Facility is in a high-velocity hurricane zone.

6. Seismic Loads:

Code:	FBC 2020 & ASCE 7-16
Risk Category:	IV
0.2 Sec. Mapped Spectral Response, S_s :	0.042 g
1.0 Sec. Mapped Spectral Response, S_1 :	0.021 g
Site Class:	C
0.2 Sec. Design Spectral Response, S_{Ds} :	0.034 g
1.0 Sec. Design Spectral Response, S_{D1} :	0.024 g
Importance Factor (I_e):	1.25
Component Importance Factor (I_p):	1.0, except $I_p=1.5$ for components identified in Section 13.1.3 of ASCE 7
Seismic Design Category	A

7. Impact Loads:

- a. Consider impact loads in design of support systems.
- b. Use the following impact load factors unless recommendations of the equipment manufacturer will cause a more severe load case:

Rotating machinery:	20% of moving load
Reciprocating machinery:	50% of moving load
Monorail Hoists:	
• Vertical	25% of lifted load
• Longitudinal	10% of lifted load
Hangers supporting floors and platforms:	33% of live and dead load

8. Temperature:

- a. Include effects of temperature in design where non-structural components and non-building structures are exposed to differential climatic conditions. See climatic conditions below for temperature extremes.

C. Load Combinations

1. Design non-structural components and non-building structures to withstand load combinations as specified in the governing building code. Where the exclusion of live load or impact load would cause a more severe load condition for the member under investigation, ignore the load when evaluating that member.

D. Design Considerations

1. Design non-structural components and non-building structures for the following conditions:
2. Climatic Conditions:

Maximum design temperature:	100	degrees Fahrenheit
Minimum design temperature:	50	degrees Fahrenheit

E. Column Base Fixity

1. Design column bases as pinned connections. No moments shall be assumed to be transferred to foundations.
 2. Where significant shear loads (greater than 5,000 lb. per anchor bolt) are transferred at column base plates, provide a shear key designed to transfer shear load.
- F. Deflection
1. Maximum beam deflection as a fraction of span for walkways and platforms: L/240 for total load and L/360 for live load.
 2. Maximum total load deflection for equipment support: L/450.

PART 3 - EXECUTION

3.01 GENERAL

- A. Make attachments and braces in such a manner that component force is transferred to the lateral force-resisting system of the structure. Base attachment requirements and size and number of braces per calculations submitted by Contractor.
- B. Anchorage of equipment is specified to be made by cast-in anchor bolts in concrete elements unless specifically noted otherwise on the Drawings or other specification sections. Contractor is responsible for remedial work or strengthening if anchor bolts are improperly installed or omitted due to lack of submittal review or improper placement for any reason, at no additional cost to City.
- C. Provide anchor bolts in accordance with Section 05 05 20. Base size of anchor bolts and embedment on submitted calculations.
- D. Submit details of and calculations for anchorages prior to placement of concrete or erection of other structural supporting members. Submittals received after structural supports are in place will be rejected if proposed anchorage method would create an overstressed condition of the supporting member. Contractor is responsible for revisions to anchorages and/or strengthening of structural support so that there is no overstress condition, at no additional cost to City.

**** END OF SECTION ****

SECTION 01 77 50
WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 SUMMARY

A. Scope

1. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including standard warranties on products and special warranties required of the Contractor and Suppliers.

1.02 RELATED WORK

- A. Refer to the General Requirements for additional requirements relating to warranties and bonds.
- B. General closeout requirements are included in Section 01 70 00 – Contract Closeout.
- C. Specific requirements for warranties for the Work and products and installations that are specified to be warranted are included in the individual Sections.
- D. Certifications and other commitments and agreements for continuing services to City are specified elsewhere in the Contract Documents.

1.03 SUBMITTALS

- A. The following minimum submittals shall be submitted in accordance with Section 01 33 00 - Submittals.
 1. A copy of this Section, with addendum updates included, and all referenced and applicable Sections, with addendum updates included, with each paragraph check-marked to indicate Specification compliance or marked to indicate requested deviations from Specification requirements or those parts which are to be provided by the Contractor or others shall be provided. Check marks (✓) shall denote full compliance with a paragraph as a whole.

If deviations from the Specifications are indicated, and therefore requested, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph, referenced to a detailed written explanation of the reasons for requesting the deviation. The Engineer shall be the final authority for determining acceptability of requested deviations.
 2. Warranty information, including standard and special warranties, shall be provided with the submittals for the equipment and materials included in the Work and as specified in the Technical Specifications.
 3. Warranty information, including standard and special warranties, shall also be provided with the O&M Manual submittals for equipment included in the Work in accordance with Section 01 77 30 – Operating and Maintenance Instructions.
 4. A compiled set of warranty information with the warranty commencement date fixed, including standard and special warranties, shall be provided 15 days prior to the date fixed as Substantial Completion by the Engineer as follows:

- a. Submit two copies of each warranty and bond, properly executed by the Contractor, or Subcontractor, Supplier, or Manufacturer in two 3-ring binders (one set of warranties and bonds per binder). Organize the warranty documents into an orderly sequence based on the sequential number of the related Technical Specification.
 - b. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents and sized to receive 8-1/2-in by 11-in paper.
 - c. Provide a Table of Contents neatly typed, in the sequence of the Table of Contents of the Technical Specifications, with each item identified with the number and title of the Section in which specified and the name of the product or Work item
 - d. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address and telephone number of the installer, supplier and manufacturer.
 - e. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS", the project title or name and the name, address and telephone number of the Contractor and equipment supplier(s).
5. If partial Substantial Completions are defined in Section 01 01 00 – Summary of Work, then specified warranties and bonds for all equipment and scope of supply which are part of the partial Substantial Completion shall be compiled and submitted in accordance with the requirements noted for overall project Substantial Completion.

1.04 FORMAT OF WARRANTIES

- A. Warranties shall be provided on standard 8-1/2 by 11 paper, portrait landscaped.
- B. When a special warranty is required, a written document that contains the appropriate terms and identification, ready for execution by the required parties shall be provided.
- C. Refer to individual Sections for specific content requirements, and particular requirements for submittal of special warranties.

1.05 SCHEDULE OF SPECIAL WARRANTIES

- A. Special warranties shall be provided as specified in the specific equipment Section.

1.06 WARRANTY REQUIREMENTS

- A. All equipment and Work whether or not specified in the relevant equipment or Work sections shall have a minimum warranty of one (1) year from the date of the Notice of Substantial Completion certificate issued for the Work and shall at a minimum conform to the requirements of this Section. Additional warranty time or special warranties requirements may be required in the Technical Specifications.
- B. Note that if partial Substantial Completions are allowed for certain areas of the Work, these are noted in Section 01 01 00 – Summary of Work.

- C. **Related Damages and Losses:** When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- D. **Reinstatement of Warranty:** When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- E. **Replacement Cost:** Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the City has benefited from use of the Work through a portion of its anticipated useful service life.
- F. **City's Recourse:** Written warranties made to the City are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the City can enforce such other duties, obligations, rights, or remedies.
- G. **Rejection of Warranties:** The City reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- H. The City reserves the right to refuse to accept Work for the project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.
- I. **Disclaimers and Limitations:** Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers and subcontractors required to countersign special warranties with the Contractor.
- J. **Separate Prime Contracts:** Each Prime Contractor is responsible for warranties related to its own Contract.

1.07 MANUFACTURERS CERTIFICATIONS

- A. Where required, the Contractor shall supply evidence, satisfactory to the Engineer, that the Contractor can obtain manufacturers' certifications as to the Contractor's installation of equipment.

1.08 DEFINITIONS

- A. Standard warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the Manufacturer to the City.
- B. Special warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the City.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

**** END OF SECTION ****

SECTION 01 77 55
MEMBRANE SYSTEM PERFORMANCE WARRANTY

PART 1 - GENERAL

1.01 THE REQUIREMENT

- A. Membrane System Performance.
- B. Technical Services.
- C. Membrane Element Replacement.
- D. Workmanship and Materials.
- E. Administration of Warranty.

1.02 RELATED WORK

- A. Section 46 63 11: Membrane Elements and MEM's Services.

1.03 SUBMITTAL REQUIREMENTS

- A. Membrane process projections from the Membrane Element Manufacturer (MEM) for membrane ages 0 through 3 years shall be submitted upon execution of the Contract.
- B. This warranty shall be submitted as part of the Contract.

1.04 DEFINITIONS

- A. ARRAY. The arrangement of pressure vessels and membrane elements in a membrane unit or train, described by the number of vessels in the first stage and the number of vessels in the second stage (and third stage if applicable) (e.g. 4:2 means 4 vessels in the first stage and 2 vessels in the second stage) and the number of membrane elements in each pressure vessel.
- B. CAPACITY. The total flow of permeate produced by any one of the membrane units in a 24-hour period at the standard conditions specified in this Warranty. The capacity shall be normalized to the standard conditions according to the MEM's standard normalization software available as of the date of Award or similar normalization software submitted by the MEM and approved by the OWNER and ENGINEER. Calculation procedures used in this software should be consistent with procedures used in the latest revision of ASTM D4516 "Standard Practice for Standardizing Reverse Osmosis Performance Data" and industry standards.

- C. FEED PRESSURE. The pressure measured downstream of the feed inlet valve.
- D. FEED TEMPERATURE. Temperature of feed water measured at the inlet manifold to the membranes. This temperature is to be used for normalization of membrane performance.
- E. FLUX. The average rate of permeate, in gallons permeated across one square foot of the installed membrane surface in one day, with units of GFD (gallons per square foot per day). Average flux for a membrane train or unit shall be calculated as the total unit permeate flow divided by the total membrane area installed in all stages of the unit. Average flux for a single stage shall be calculated as the total stage permeate flow divided by the total membrane area installed in that stage.
- F. FOULING ALLOWANCE. An allowance for flux decline and the associated increase in the transmembrane pressure which is required to maintain the specified capacity and to overcome the anticipated fouling of the membrane elements over and above the initial transmembrane pressure when the membrane elements are new and operating at design pressure, temperature, and recovery rate.
- G. MEMBRANE ELEMENT. A standard 8-inch diameter, 40-inch length, spiral wound membrane unit with an average active area of 400 square feet.
- H. MEMBRANE ELEMENT REPLACEMENT. Refers to replacement of the installed membrane elements with new elements. Membrane replacement does not include the addition of membranes to the system (i.e., membrane replacement does not increase the number of elements in a membrane unit) or chemically treating the membranes in order to modify the salt rejection.
- I. MEMBRANE UNIT. An individual control block containing an array of membranes that can be started or stopped individually.
- J. PERMEATE. The purified water which passes through the membrane itself and exits through the membrane product tube. The combined permeate from a unit is the purified water from all vessels and all stages of the membrane unit as it exits the unit through the permeate header. "Permeate" is distinguished from "product water" or "finished water" which may have been blended with raw or lime softened water or received additional treatment.
- K. PROCESS DESIGN. The process design referred to in this Section is the array of vessels and elements supplied under this Contract, the required operating pressure, system recovery, flux, salt rejection, system pressure drops, etc., required to produce the specified capacity at the specified permeate quality from the specified raw water quality, considering the feed temperature, membrane age, etc.
- L. RECOVERY. The ratio of permeate flow produced divided by the amount of feed water used to produce the permeate.

- M. STAGE. A group of pressure vessels operating in parallel with the same quality feed water, also referred to as a bank.
- N. TERM OF WARRANTY. The duration of the warranties for each membrane unit and its installed membrane elements as defined in the section entitled MEMBRANE PERFORMANCE AND MEMBRANE ELEMENT REPLACEMENT of this Warranty. The term of warranty also applies to membrane performance.
- O. TOTAL (COMBINED) PERMEATE PRESSURE. The pressure of the combined permeate from all stages at the exit of the pressure vessels containing the membranes as measured upstream of the check valves and isolation butterfly valve on the permeate header at the same elevation as the feed pressure measurement. A function of the individual membrane plant piping arrangement.
- P. TRANSMEMBRANE PRESSURE for the individual membrane unit is defined as the difference in pressure between the membrane unit feed stream measured at the pressure tap located downstream of the automated valve on the membrane feed pump discharge header and the total (combined) permeate stream pressure measured at the pressure tap upstream of the train total permeate isolation valve at the same elevation as the feed pressure.

1.05 MEMBRANE SYSTEM WARRANTIES

A. MEMBRANE PERFORMANCE AND MEMBRANE ELEMENT REPLACEMENT

The Membrane Element Manufacturer (MEM) warrants for thirty-six months from the date of successful Performance Acceptance Test completion that each membrane unit will be capable of producing water at the quality specified in Table 01 77 55-1 and the quantity specified in Table 01 77 55-2

The performance is based on the feed water analysis and temperature provided in Table 01 77 55-1 and operating conditions described in Table 0 1741-2. In the event that actual feed water conditions differ from these values, the performance criteria specified in the section entitled MEMBRANE ELEMENT AND SYSTEM PERFORMANCE REQUIREMENTS of this Warranty shall be correspondingly adjusted using the latest version of the MEM's membrane process performance normalization software available as of the date of Award or similar normalization software submitted by the MEM and approved by the OWNER and ENGINEER. Calculation procedures used in this software should be consistent with procedures used in the latest revision of ASTM D4516 "Standard Practice for Standardizing Reverse Osmosis Performance Data" and industry standards.

The MEM agrees to the membrane element replacement conditions described herein in the event that the membrane elements fail to meet the performance requirements. In the event that the membrane elements in any treatment unit fail to meet the specified performance requirements during the thirty-six-month term of the warranty after the completion of the Performance Acceptance Test for that unit, and the performance cannot be restored by normal chemical cleaning, the MEM shall remove

the failed membrane elements and replace them with new elements at no cost to the OWNER. Treating the membranes with any chemicals to change the rejection or flux rates of the membranes is not acceptable.

The above warranty is contingent upon the OWNER operating the plant in accordance with the provisions of the section entitled SYSTEM OPERATION AND MAINTENANCE of this Warranty.

1.06 WATER QUALITY

- A. The membrane elements furnished by the MEM shall be warranted to produce the specified permeate quality and quantity from the projected membrane raw water listed below in Table 01 77 55-1.

1.07 MEMBRANE ELEMENT AND SYSTEM PERFORMANCE REQUIREMENTS

- A. The system performance requirements are summarized in Tables 01 77 55-1 and 01 77 55-2.
- B. The membrane elements furnished by the MEM for Membrane Units 1 through 7 are warranted to produce a capacity of 2.00 million gallons of permeate per unit per 24-hour day of operation. All membrane unit capacities shall be measured while producing the specified permeate quality and operating at the specified transmembrane pressure, feed temperature, recovery and with the raw water specified in Table 01 77 55-1.
- C. The permeate flow rate for each unit shall be determined by the MEM's standard normalization software available as of the date of Award or similar normalization software submitted by the MEM and approved by the OWNER and ENGINEER. Calculation procedures used in this software should be consistent with procedures used in the latest revision of ASTM 04516 "Standard Practice for Standardizing Reverse Osmosis Performance Data" and industry standards.
- D. Membrane permeate parameters listed above for which no value is indicated in the table, except pH, must meet Federal and State regulations for drinking water.

Table 01 77 55-1 Projected and Required Water Quality

Parameter	Unit	Projected Raw Water	Required Permeate
Bicarbonate ^(a) , ion	mg/L	322.1	25 to 75
Barium	mg/L	0.02	
Carbonate ^(a) , ion	mg/L	0.36	
Calcium	mg/L	94.4	
Chloride	mg/L	41.0	
Color	CU		<3.0
Carbon dioxide	mg/L	29.23	
Fluoride	mg/L	0.3	
Hydrogen Sulfide	mg/L		
Iron (Dissolved)	mg/L	0.7	<0.15
Magnesium	mg/L	5.1	
Nitrate	mg/L as NO ₃		
pH (non-acidified)	--	7.20	
Potassium	mg/L	3.4	
Silica	mg/L as SiO ₂	7.60	
Silt Density Index (Post Cartridge Filter) (15 min. @30 psi)	--		
Sodium	mg/L	45.0	
Strontium	mg/L	1.0	
Sulfate	mg/L	32.0	
Temperature	°C	26.5	
Total Dissolved Solids ^(b)	mg/L	553	<200
Total Hardness	mg/L as CaCO ₃	256.9	Minimum: 20
Total Organic Carbon	mg/L as C		<1.0
Total Trihalomethane ^(c) Formation Potential	mg/L		<0.040
Haloacetic Acid Formation Potential ^(d)	mg/L		<0.030

(a) At natural pH of well water, approximate pH = 7.2.

(b) TDS as sum of ions.

(c) At formation conditions of pH 8.5, chlorine dose of 6.0 mg/L, water temperature of 24° C, and 72 hours contact time.

(d) Total formation potential for the five haloacetic acids regulated under the Disinfectants/Disinfection By-Products Rule and at the conditions referenced for Total Trihalomethane Formation Potential.

Table 01 77 55-2 Membrane System Design Criteria

<i>Parameter</i>	Membrane Units 1-7
Total Permeate Capacity (mgd)	14
Number of Units	7
Permeate Capacity per Unit (mgd)	2.00
Design Recovery Rate (%)	87%
Maximum Transmembrane Pressure* During Performance Test (psi)	80
Membrane Element Diameter – Nominal (inches)	8
Element Length (inches)	40
Effective Membrane Area per Element (square feet)	400
Maximum Average Permeate Flux Rate per Unit (gfd)	13.7
Maximum Average Stage-One Permeate Water Flux (gfd)	14.8
Number of Membrane Elements per Pressure Vessel	7
Number of Stages per Unit	3
Number of Pressure Vessels per Unit	54
Number of First-Stage Pressure Vessels per Unit	32
Number of Second-Stage Pressure Vessels per Unit	16
Number of Third-Stage Pressure Vessels per Unit**	6
Number of Membrane Elements per Unit**	366

*Transmembrane Pressure is defined in the section entitled DEFINITIONS of this Warranty and is the feed pressure minus the total permeate pressure, both measured at same elevation. Permeate pressure at this plant varies between 20 and 23 psig.

**The existing units have spacers in positions 1 and 2 of the third-stage pressure vessels, so each third-stage vessel has only five elements installed.

- E. The membrane elements shall be warranted to produce the specified capacity of permeate with average flux rates not to exceed the values stated in Table 01 77 55-2. These average flux rates shall be calculated on the basis of 400 square feet per 8-inch by 40-inch long element. In addition to maximum average flux rates for the entire membrane unit, Table 01 77 55-2 also specifies a maximum average flux rate for the first stage. The first stage flux rate can be adjusted by applying a back-pressure of up to 6 psig to the first stage only as long as the overall unit transmembrane pressure specified in Table 01 77 55-2 is not exceeded.

- F. The membrane elements furnished by the MEM shall be warranted to produce the specified permeate quantity and quality at a transmembrane pressure not to exceed that specified in Table 01 77 55-2 during the seven-day performance test. In addition, the membrane elements furnished by the MEM shall be warranted to produce the specified permeate quantity and quality at a transmembrane pressure not to exceed the value specified in Table 01 77 55-2 over the life of the warranty period.

- G. The performance requirements will not apply if excessive or abnormal fouling has occurred on the membrane elements.

1.08 SYSTEM OPERATION AND MAINTENANCE

- A. The OWNER agrees to operate the membrane softening system in accordance with the MEM's operating and maintenance instructions. The OWNER further agrees to provide a continuous supply of clean raw water to the system with water quality similar to that indicated above and the following additional operating guidelines (to be filled in by the MEM):

Maximum cleaning solution temperature: _____ degrees F
Maximum feed water SDI: <4.0 (based on 15 minutes)
Maximum feed water pH: _____
Minimum feed water pH: _____
Maximum cleaning solution pH: _____
Minimum cleaning solution pH: _____
Maximum cleaning solution flow pressure drop across the pressure vessel: ____
psi
Maximum flow of cleaning solution: 60 gpm/vessel

- B. The OWNER agrees to clean the membranes in strict conformance with the MEM's instructions regarding methods, cleaning agents, and frequency.
- C. The OWNER agrees to calculate the normalized system performance on a monthly basis using the MEM's standard normalization software available as of the date of Award or similar normalization software submitted by the MEM and approved by the OWNER and ENGINEER. The OWNER agrees to provide the MEM with monthly performance analysis reports using the MEM's normalization software.

1.09 ADMINISTRATION OF WARRANTY

- A. The OWNER agrees to notify the MEM in writing of a warranty claim for a performance or workmanship deficiency in accordance with the terms of this WARRANTY. The deficiency will be described in detail and supported by operational and water analysis data wherever possible.
- B. The MEM agrees to acknowledge receipt of the warranty claim within seven (7) calendar days of receiving the claim, and describe what action the MEM is planning to take.
- C. The MEM agrees to repair or replace membrane elements to restore performance within forty-five (45) calendar days of receipt of the warranty claim if membrane element performance or workmanship is found to have caused Warranty deficiency. For replacement of greater than 500 membrane elements, MEM and OWNER shall mutually agree upon a delivery schedule, not to exceed 90 days.
- D. The MEM shall have the right to request that the OWNER have the conductivity meter, flow meters and pressure gauges on the membrane unit associated with the warranty claim calibrated.

- E. Special tests required to determine the performance deficiency will be done at the MEM's sole expense.
- F. All efforts, labor, expenses, etc., to prove that the membrane elements are fouled shall be borne by the MEM.

END OF SECTION

SECTION 01 78 23
OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 SCOPE

- A. Operation and maintenance (O&M) instructions shall be provided in accordance with this section and as required in the technical sections of this project manual. O&M information shall be provided for each maintainable piece of equipment, equipment assembly or subassembly, and material provided or modified under this contract.
- B. O&M instructions must be submitted and accepted before on-site training may start.

1.02 TYPES OF INFORMATION REQUIRED

- A. General:
 - 1. O&M information shall contain the names, addresses, and telephone numbers of the manufacturer, the nearest representative of the manufacturer, and the nearest supplier of the manufacturer's equipment and parts. In addition, one or more of the following items of information shall be provided as applicable.
- B. Operating Instructions:
 - 1. Specific instructions, procedures, and illustrations shall be provided for the following phases of operations:
 - a. Safety Precautions: List personnel hazards for equipment and list safety precautions for all operating conditions.
 - b. Operator Prestart: Provide requirements to set up and prepare each system for use.
 - c. Start-Up, Shutdown, And Post shutdown Procedures: Provide a control sequence for each of these operations.
 - d. Normal Operations: Provide control diagrams with data to explain operation and control of systems and specific equipment.
 - e. Emergency Operations: Provide emergency procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage to systems and equipment. Include emergency shutdown instructions for fire, explosion, spills, or other foreseeable contingencies. Provide guidance on emergency operations of all utility systems including valve locations and portions of systems controlled.
 - f. Operator Service Requirements: Provide instructions for services to be performed by the operator such as lubrication, adjustments, and inspection.
 - g. Environmental Conditions: Provide a list of environmental conditions (temperature, humidity, and other relevant data) which are best suited for each product or piece of equipment and describe conditions under which equipment should not be allowed to run.
- C. Preventive Maintenance:

1. The following information shall be provided for preventive and scheduled maintenance to minimize corrective maintenance and repair:
 - a. Lubrication Data: Provide lubrication data, other than instructions for lubrication in accordance with paragraph 1.02 Operator Service Requirements.
 - 1) A table showing recommended lubricants for specific temperature ranges and applications;
 - 2) Charts with a schematic diagram of the equipment showing lubrication points, recommended types and grades of lubricants, and capacities; and
 - 3) A lubrication schedule showing service interval frequency.
 - b. Preventive Maintenance Plan And Schedule: Provide manufacturer's schedule for routine preventive maintenance, inspections, tests, and adjustments required to ensure proper and economical operation and to minimize corrective maintenance and repair. Provide manufacturer's projection of preventive maintenance man-hours on a daily, weekly, monthly, and annual basis including craft requirements by type of craft.

D. Corrective Maintenance:

1. Manufacturer's recommendations shall be provided on procedures and instructions for correcting problems and making repairs.
 - a. Troubleshooting Guides And Diagnostic Techniques: Provide step-by-step procedures to promptly isolate the cause of typical malfunctions. Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.
 - b. Wiring Diagrams And Control Diagrams: Wiring diagrams and control diagrams shall be point-to-point drawings of wiring and control circuits including factory-field interfaces. Provide a complete and accurate depiction of the actual job-specific wiring and control work. On diagrams, number electrical and electronic wiring and pneumatic control tubing and the terminals for each type identically to actual installation numbering.
 - c. Maintenance And Repair Procedures: Provide instructions and list tools required to restore product or equipment to proper condition or operating standards.
 - d. Removal And Replacement Instructions: Provide step-by-step procedures and list required tools and supplies for removal, replacement, disassembly, and assembly of components, assemblies, subassemblies, accessories, and attachments. Provide tolerances, dimensions, settings, and adjustments required. Instructions shall include a combination of test and illustrations.
 - e. Spare Parts And Supply Lists: Provide lists of spare parts and supplies required for maintenance and repair to ensure continued service or operation without unreasonably delays. Special consideration is required for facilities at remote locations. List spare parts and supplies that have a long lead time to obtain.
 - f. Corrective Maintenance Manhours: Provide manufacturer's projection of corrective maintenance man-hours including craft requirements by type of craft. Corrective maintenance that requires participation of the equipment manufacturer shall be identified and tabulated separately.

E. Appendices:

1. The following information shall be provided; include information not specified in the preceding paragraphs but pertinent to the maintenance or operation of the product or equipment.
 - a. **Parts Identification:** Provide identification and coverage for all parts of each component, assembly, subassembly, and accessory of the end items subject to replacement. Include special hardware requirements, such as requirement to use high-strength bolts and nuts. Identify parts by make, model, serial number, and source of supply to allow reordering without further identification. Provide clear and legible illustrations, drawings, and exploded views to enable easy identification of the items. When illustrations omit the part numbers and description, both the illustrations and separate listing shall show the index, reference, or key number which will cross-reference the illustrated part to the listed part. Parts shown in the listings shall be grouped by components, assemblies, and subassemblies.
 - b. **Warranty Information:** List and explain the various warranties and include the servicing and technical precautions prescribed by the manufacturers or contract documents to keep warranties in force.
 - c. **Personnel Training Requirements:** Provide information available from the manufacturers to use in training designated personnel to operate and maintain the equipment and systems properly.
 - d. **Testing Equipment And Special Tool Information:** Provide information on test equipment required to perform specified tests and on special tools needed for the operation, maintenance, and repair of components.

1.03 TRANSMITTAL PROCEDURE

- A. Unless otherwise specified, O&M manuals, information, and data shall be transmitted in accordance with Section 01 33 00 accompanied by Transmittal Form 01 78 23-A and Equipment Record Forms 01 78 23-B and/or 01 78 23-C, as appropriate, all as specified in Section 01 99 90. The transmittal form shall be used as a checklist to ensure the manual is complete. Only complete sets of O&M instructions will be reviewed for acceptance.
- B. 3 copies of the specified O&M information shall be provided after approval. For ease of identification, each manufacturer's brochure and manual shall be appropriately labeled with the equipment name and equipment number as it appears in the project manual. The information shall be organized in the binders in numerical order by the equipment numbers assigned in the project manual. The binders shall be provided with a table of contents and tab sheets to permit easy location of desired information. Binders shall be locking three-ring/"D"-ring type. Three-ring binders shall be riveted to back cover include plastic sheet lifter (page guard) at front of each volume.
- C. If manufacturers' standard brochures and manuals are used to describe O&M procedures, such brochures and manuals shall be modified to reflect only the model or series of equipment used on this project. Extraneous material shall be crossed out neatly or otherwise annotated or eliminated.

1.04 PAYMENT

- A. Acceptable O&M information for the project must be delivered to the Construction Manager prior to the project being 65 percent complete. Progress payments for work in excess of 65 percent completion will not be made until the specified acceptable O&M information has been delivered to the Construction Manager.

1.05 FIELD CHANGES

- A. Following the acceptable installation and operation of an equipment item, the item's instructions and procedures shall be modified and supplemented by the Contractor to reflect any field changes or information requiring field data.

PART 2 - PARTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

**** END OF SECTION ****

SECTION 01 79 00
DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This section contains requirements for training the City's personnel, by persons retained by the Contractor specifically for the purpose, in the proper operation and maintenance of the equipment and systems installed under this contract.

1.02 QUALITY ASSURANCE

- A. Where required by the detailed specifications, the Contractor shall provide on-the-job training of the City's personnel. The training sessions shall be conducted by qualified, experienced, factory-trained representatives of the various equipment manufacturers. Training shall include instruction in both operation and maintenance of the subject equipment.

1.03 SUBMITTALS

- A. The following information shall be submitted to the Construction Manager in accordance with the provisions of Section 01 33 00. The material shall be reviewed and accepted by the Construction Manager as a condition precedent to receiving progress payments in excess of 50 percent of the contract amount and not less than 3 weeks prior to the provision of training.
 - 1. Lessons plans for each training session to be conducted by the manufacturer's representatives. In addition, training manuals, handouts, visual aids, and other reference materials shall be included.
 - 2. Subject of each training session, identity and qualifications of individuals to be conducting the training, and tentative date and time of each training session.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Where specified, the Contractor shall conduct training sessions for the City's personnel to instruct the staff on the proper operation, care, and maintenance of the equipment and systems installed under this contract. Training shall take place at the site of the work and under the conditions specified in the following paragraphs. Approved operation and maintenance manuals shall be available at least 30 days prior to the date scheduled for the individual training session.

2.02 LOCATION

- A. Training sessions shall take place at the site of the work. Training sessions requiring hands-on lessons shall be located on the respective equipment.

2.03 LESSON PLANS

- A. Formal written lesson plans shall be prepared for each training session. Lesson plans shall contain an outline of the material to be presented along with a description of visual aids to be utilized during the session. Each plan shall contain a time allocation for each subject.
- B. One complete set of originals of the lesson plans, training manuals, handouts, visual aids, and reference material shall be the property of the City and shall be suitably bound for proper organization and easy reproduction. The Contractor shall furnish ten copies of necessary training manuals, handouts, visual aids, and reference materials at least 1 week prior to each training session.

2.04 FORMAT AND CONTENT

- A. Each training session shall be comprised of time spent both in the classroom and at the specific location of the subject equipment or system. As a minimum, training session shall cover the following subjects for each item of equipment or system:
 - 1. Familiarization
 - a. Review catalog, parts lists, drawings, etc., which have been previously provided for the plant files and operation and maintenance manuals.
 - b. Check out the installation of the specific equipment items.
 - c. Demonstrate the unit and indicate how all parts of the specifications are met.
 - d. Answer questions.
 - 2. Safety
 - a. Using material previously provided, review safety references.
 - b. Discuss proper precautions around equipment.
 - 3. Operation
 - a. Using material previously provided, review reference literature.
 - b. Explain all modes of operation (including emergency).
 - c. Check out City 's personnel on proper use of the equipment.
 - 4. Preventive Maintenance
 - a. Using material previously provided, review preventive maintenance (PM) lists including:
 - 1) Reference material.
 - 2) Daily, weekly, monthly, quarterly, semiannual, and annual jobs.
 - b. Show how to perform PM jobs.
 - c. Show City 's personnel what to look for as indicators of equipment problems.
 - 5. Corrective Maintenance
 - a. List possible problems.
 - b. Discuss repairs--point out special problems.
 - c. Open up equipment and demonstrate procedures, where practical.
 - 6. Parts
 - a. Show how to use previously provided parts list and order parts.

- b. Check over spare parts on hand. Make recommendations regarding additional parts that should be available.
- 7. Local Representatives
 - a. Where to order parts: name, address, telephone.
 - b. Service problems:
 - 1) Who to call.
 - 2) How to get emergency help.
- 8. Operation and Maintenance Manuals
 - a. Review any other material submitted.
 - b. Update material, as required.

2.05 VIDEO RECORDING:

- A. The Contractor will provide videos and copy of the videos for each training session. After taping, the material will be edited and supplemented with professionally produced graphics to provide a permanent record. The Contractor shall advise all manufacturers providing training sessions that the material will be videotaped and shall make available to the City's video taping contractor such utility services and accommodation as may be required to facilitate the production of the videotape record.

PART 3 - EXECUTION

3.01 SUMMARY

- A. Training shall be conducted in conjunction with the operational testing and commissioning periods. Classes shall be scheduled such that classroom sessions are interspersed with field instruction in logical sequence. The Contractor shall arrange to have the training conducted on consecutive days, with no more than 6 hours of classes scheduled for any one day. Concurrent classes shall not be allowed. Training shall be certified on Form 43 05 11-B specified in Section 01 99 90.
- B. Acceptable operation and maintenance manuals for the specific equipment shall be provided to the City prior to the start of any training. Video taping shall take place concurrently with all training sessions.
- C. The following services shall be provided for each item of equipment or system as required in individual specification sections. Additional services shall be provided, where specifically required in individual specification sections.
 - 1. As a minimum classroom equipment training for operations personnel will include:
 - a. Using slides and drawings, discuss the equipment's specific location in the plant and an operational overview.
 - b. Purpose and plant function of the equipment.
 - c. A working knowledge of the operating theory of the equipment.
 - d. Start-up, shutdown, normal operation, and emergency operating procedures, including a discussion on system integration and electrical interlocks, if any.
 - e. Identify and discuss safety items and procedures.

- f. Routine preventative maintenance, including specific details on lubrication and maintenance of corrosion protection of the equipment and ancillary components.
 - g. Operator detection, without test instruments, of specific equipment trouble symptoms.
 - h. Required equipment exercise procedures and intervals.
 - i. Routine disassembly and assembly of equipment if applicable (as judged by the City on a case-by-case basis) for purposes such as operator inspection of equipment.
2. As a minimum, hands-on equipment training for operations personnel will include:
 - a. Identify location of equipment and review the purpose.
 - b. Identifying piping and flow options.
 - c. Identifying valves and their purpose.
 - d. Identifying instrumentation:
 - 1) Location of primary element.
 - 2) Location of instrument readout.
 - 3) Discuss purpose, basic operation, and information interpretation.
 - e. Discuss, demonstrate, and perform standard operating procedures and round checks.
 - f. Discuss and perform the preventative maintenance activities.
 - g. Discuss and perform start-up and shutdown procedures.
 - h. Perform the required equipment exercise procedures.
 - i. Perform routine disassembly and assembly of equipment if applicable.
 - j. Identify and review safety items and perform safety procedures, if feasible.
 3. Classroom equipment training for the maintenance and repair personnel will include:
 - a. Theory of operation.
 - b. Description and function of equipment.
 - c. Start-up and shutdown procedures.
 - d. Normal and major repair procedures.
 - e. Equipment inspection and troubleshooting procedures including the use of applicable test instruments and the "pass" and "no pass" test instrument readings.
 - f. Routine and long-term calibration procedures.
 - g. Safety procedures.
 - h. Preventative maintenance such as lubrication; normal maintenance such as belt, seal, and bearing replacement; and up to major repairs such as replacement of major equipment part(s) with the use of special tools, bridge cranes, welding jigs, etc.
 4. Hands-on equipment training for maintenance and repair personnel shall include:
 - a. Locate and identify equipment components.
 - b. Review the equipment function and theory of operation.
 - c. Review normal repair procedures.
 - d. Perform start-up and shutdown procedures.

- e. Review and perform the safety procedures.
- f. Perform City approved practice maintenance and repair job(s), including mechanical and electrical adjustments and calibration and troubleshooting equipment problems.

**** END OF SECTION ****

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SECTION 01 91 00
COMMISSIONING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This section contains requirements for the Contractor's performance during the commissioning of the structures, equipment and systems constructed and installed during the course of this contract. All commissioning work, as described in this section, shall be performed by the Contractor.

1.02 QUALITY ASSURANCE

- A. Cleanup:
1. Following completion of the operational testing period, the Contractor shall remove, clean, and replace all permanent and temporary filters and strainers in all pipeline systems; replace all HVAC filters; dewater and clean all sumps; and dewater all process units for final inspection as a condition precedent to commissioning.
- B. Commissioning Team:
1. The Contractor shall assemble a commissioning team under the direction of an individual duly authorized to commit the Contractor's personnel and resources to respond to requests for assistance on the part of the Construction Manager or, through the Construction Manager, the City. The commissioning team shall consist of representatives of the Contractor's mechanical, electrical, and instrumentation subcontractors, and others as appropriate. The commissioning team shall be available at the site of the work during normal working hours (8 hours a day, 5 days a week, Saturdays, Sundays, and legal holidays excepted) and shall be available within 2 hours' notice at all other times upon notice by telephone. The commissioning team shall at all times be equipped and ready to provide for emergency repairs, adjustments, and corrections to the equipment and systems installed and modified as a part of this contract.

1.03 SUBMITTALS

- A. The following information shall be submitted to the Construction Manager in accordance with the provisions of Section 01 33 00:
1. Detailed plans for commissioning each process unit and each system constructed or modified as a part of the work performed under this contract.
 2. The Contractor's plan for providing a commissioning team conforming to the requirements of paragraph 1.02 Commissioning Team during the commissioning period. The plan shall be complete with a daytime staffing plan and names, qualifications, and telephone numbers of those assigned to off-hour standby duty.

PART 2 - PRODUCTS

2.01 SUMMARY

- A. Working with representatives of the City and the Construction Manager, the Contractor shall develop and produce a detailed, written plan for the startup and initial operation, under actual operating conditions, of the equipment and systems installed and constructed under this contract. The document, after acceptance by the Construction Manager, shall serve as the guidance manual for the commissioning process.

PART 3 - EXECUTION

3.01 SUMMARY

- A. After completion of the equipment and system performance and operational testing, where required, and agreement on the part of the Construction Manager that the systems did meet all test requirements, commissioning will begin. The commissioning period for each modified or new unit process system shall be 4 weeks. The Contractor shall remove all temporary piping, bulkheads, controls and other alterations to the permanent systems that may have been needed during the performance and operational testing and shall perform the tasks necessary to make the improvements constructed under this contract fully operational. The Construction Manager shall confirm in writing the date(s) that the system is ready for commissioning and on which actual commissioning activities commence. Activities conducted prior to such written confirmation shall not constitute commissioning. The following specific tasks are to be performed as a part of the commissioning process:
 - B. The City's operation and maintenance personnel will be responsible for operation of the systems to be commissioned. The portion of the work to be commissioned shall be fully operational, performing all functions for which it was designed.
 - C. The Contractor shall be available at all times during commissioning periods to provide immediate assistance in case of failure of any portion of the system being constructed. At the end of the commissioning period and when all corrections required by the Construction Manager to assure a reliable and completely operational facility are complete, the Construction Manager shall issue a completion certificate. Each system shall have been issued a completion certificate as a condition precedent to the final acceptance of the work of this contract.
 - D. During the commissioning period, the City shall be responsible for all normal operational costs and the Contractor shall bear the costs of all necessary repairs or replacements, including labor and materials, required to keep the portion of the plant being commissioned, operational.

**** END OF SECTION ****

SECTION 01 99 90
REFERENCE FORMS

PART 1 FORMS

1.01 DESCRIPTION

- A. The forms listed below and included in this section are referenced from other sections of the project manual:

Form No.	Title
01 33 00-A	Submittal Transmittal Form
01 45 20-A	Equipment Test Report Form
01 78 23-A	Operation and Maintenance Transmittal Form
01 78 23-B	Equipment Record Form
01 78 23-C	Equipment Record Form
09 90 00-A	Coating System Inspection Checklist
26 05 00-A	Wire and Cable Resistance Test Data Form
26 05 00-B	Installed Motor Test Data Form
26 05 00-C	Dry Transformer Test Data Form
26 05 00-D	Motor Control Center Test Form
26 05 00-E	Medium Voltage Motor Starter Test Form
26 05 00-F	Medium Voltage Switchgear Test Form
26 05 00-G	Protective Relay Test Form
26 05 00-H	Low Voltage Switchgear Test Form
26 05 00-I	Medium Voltage Load Interrupter Switch Test Form
26 05 00-J	Liquid-Filled Transformer Test Form
26 05 00-K	Automatic Transfer Switch Test Form
26 05 00-L	Neutral Grounding Resistor Test
40 61 13-A	Loop Wiring and Insulation Resistance Test Data Form
40 61 13-B	Control Circuit Piping Leak Test Form
40 61 13-C	Controller Calibration Test Data Form
40 61 13-D	Panel Indicator Calibration Test Data Form
40 61 13-E	Recorder Calibration Test Data Form
40 61 13-F	Signal Trip Calibration Test Data Form
40 61 13-G	Field Switch Calibration Test Data Form
40 61 13-H	Transmitter Calibration Test Data Form
40 61 13-I	Miscellaneous Instrument Calibration Test Data Form
40 61 13-J	Individual Loop Test Data Form
40 61 13-K	Loop Commissioning Test Data Form
43 05 11-A	Manufacturer's Installation Certification Form
43 05 11-B	Manufacturer's Instruction Certification Form
43 05 11-C	Unit Responsibility Certification Form
43 05 13-A	Rigid Equipment Mount Installation Inspection Checklist
43 05 21-A	Motor Data Form

01 33 00-A. SUBMITTAL TRANSMITTAL FORM

Submittal Transmittal

Submittal Description:	Submittal No: ¹	Spec Section:
------------------------	----------------------------	---------------

	Routing	Sent	Received
Owner:	Contractor/CM		
Project:	CM/Engineer		
	Engineer/CM		
Contractor:	CM/Contractor		

We are sending you:

- Attached
- Under separate cover via _____
- Submittals for review and comment
- Product data for information only

Remarks: _____

Item	Copies	Date	Section No.	Description	Review action ^a	Reviewer initials	Review comments attached

^aNote: NET = No exceptions taken; MCN = Make corrections noted; A&R = Amend and resubmit; R = Rejected
Attach additional sheets if necessary.

Contractor

Certify either a or b:

- a. We have verified that the material or equipment contained in this submittal meets all the requirements, including coordination with all related work, specified (no exceptions).
- b. We have verified that the material or equipment contained in this submittal meets all the requirements specified except for the attached deviations.

No.	Deviation

Certified by: _____

Contractor's Signature: _____

¹See Section 01 33 00-1.04. A, Transmittal Procedure.

01 45 20-A. EQUIPMENT TEST REPORT FORM

NOTE: This example equipment test report is provided for the benefit of the Contractor and is not specific to any piece of equipment to be installed as a part of this project. The example is furnished as a means of illustrating the level of detail required for the preparation of equipment test report forms for this project.

City Of Sample

Example Water Treatment Plant
Stage IV Expansion Project

ABC Construction Company, Inc., General Contractor
XYZ Engineering, Inc., Construction Manager

Equipment Test Report

- Equipment Name: Sludge Pump 2
- Equipment Number: P25202
- Specification Ref: 11390
- Location: East Sedimentation Basin Gallery

	Contractor		Construction Manager	
	Verified	Date	Verified	Date
A. Preoperational Checklist				
1. Mechanical				
a. Lubrication				
b. Alignment				
c. Anchor bolts				
d. Seal water system operational				
e. Equipment rotates freely				
f. Safety guards				
g. Valves operational				
h. Hopper purge systems operational				
i. Sedimentation tank/hopper clean				
j. O&M manual information complete				
k. Manufacturer's installation certificate complete				
2. Electrical (circuit ring-out and high-pot tests)				
a. Circuits:				
1) Power to MCC 5				
2) Control to HOA				
3) Indicators at MCC:				
a) Red (running)				
b) Green (power)				
c) Amber (auto)				
4) Indicators at local control panel				
b. Wiring labels complete				
c. Nameplates:				
1) MCC				
2) Control station				
3) Control panel				

	Contractor		Construction Manager	
	Verified	Date	Verified	Date
d. Equipment bumped for rotation				
3. Piping Systems				
a. Cleaned and flushed:				
1) Suction				
2) Discharge				
b. Pressure tests				
c. Temporary piping screens in place				
4. Instrumentation and Controls				
a. Flowmeter FE2502F calibration				
1) Calibration Report No.				
b. Flow recorder FR2502G calibrated against transmitter				
c. VFD speed indicator calibrated against independent reference				
d. Discharge overpressure shutdown switch calibration				
e. Simulate discharge overpressure Shutdown				
B. Functional Tests				
1. Mechanical				
a. Motor operation temperature satisfactory				
b. Pump operating temperature satisfactory				
c. Unusual noise, etc?				
d. Pump operation: 75 gpm/50 psig				
(1) Measurement:				
(a) Flow:				
(b) Pressure:				
(c) Test gage number:				
e. Alignment hot				
f. Dowelled in				
g. Remarks:				
2. Electrical				
a. Local switch function:				
1) Runs in HAND				
2) No control power in OFF				
3) Timer control in AUTO				
b. Overpressure protection switch PS2502C functional in both HAND and AUTO				
c. Overpressure protection switch PS2502C set at 75 psig				
d. PLC 2500 set at 24-hour cycle, 25 min ON				

	Contractor		Construction Manager	
	Verified	Date	Verified	Date
C. Operational Test				
1. 48-hour continuous test. Pump cycles as specified, indicators functional, controls functional, pump maintains capacity, overpressure protection remains functional, hour meter functional				
RECOMMENDED FOR BENEFICIAL OCCUPANCY:				
Construction Manager			Date	
ACCEPTED FOR BENEFICIAL OCCUPANCY				
Owner's Representative			Date	

01 78 23-A. OPERATION AND MAINTENANCE TRANSMITTAL FORM

Date:	Submittal No: ²
To:	Contract No:
	Spec. Section:
	Submittal Description:
Attention:	From:

Checklist	Contractor		Construction Manager	
	Satisfactory	N/A	Accept	Deficient
1. Table of contents				
2. Equipment record forms				
3. Manufacturer information				
4. Vendor information				
5. Safety precautions				
6. Operator prestart				
7. Start-up, shutdown, and postshutdown procedures				
8. Normal operations				
9. Emergency operations				
10. Operator service requirements				
11. Environmental conditions				
12. Lubrication data				
13. Preventive maintenance plan and schedule				
14. Troubleshooting guides and diagnostic techniques				
15. Wiring diagrams and control diagrams				
16. Maintenance and repair procedures				
17. Removal and replacement instructions				
18. Spare parts and supply list				
19. Corrective maintenance man-hours				
20. Parts identification				
21. Warranty information				
22. Personnel training requirements				
23. Testing equipment and special tool information				

Remarks:

Contractor's Signature :

² See Section 01 33 00-1.04.A, Transmittal Procedure.
 REPLACEMENT OF NANOFILTRATION
 PROCESS PRESSURE VESSELS AND
 MEMBRANE ELEMENTS
 PROJECT 195837

01 78 23-B. EQUIPMENT RECORD FORM

Equip Descrip		Equip Loc	
Equip No.	Shop Dwg No.	Date Inst	Cost
Mfgr		Mfgr Contact	
Mfgr Address			Phone
Vendor		Vendor Contact	
Vendor Address			Phone

Maintenance Requirements	D	W	M	Q	S	A	Hours

Lubricants: Recommended: _____
Alternative: _____

Misc. Notes:

Recommended Spare Parts				Electrical Nameplate Data			
Part No	Quan	Part Name	Cost	Equip			
				Make			
				Serial No.		Id No.	
				Model No.		Frame No.	
				Hp	V	Amp	Hz
				Ph	Rpm	Sf	Duty
				Code	Insl. Cl	Des	Type
				Nema Des	C Amb	Temp Rise	Rating
				Misc.			
				Mechanical Nameplate Data			
				Equip			
				Make			
				Serial No.		Id No.	
				Model No.		Frame No.	
				Hp	Rpm	Cap	Size
				Tdh	Imp Sz	Belt No.	Cfm
				Psi	Assy No.	Case No.	
				Misc			

Revise the Coating System Inspection Checklist only if tests have been added to or deleted from the guide checklists

09 90 00-A COATING SYSTEM INSPECTION CHECKLIST

Project Name

Owner		Coating System Manufacturer (CSM)	
General Contractor (GC)		Coating System Applicator (CSA)	
Area or Structure		Location within Structure	
Coating System (eg E-1)		Coating Type (eg Epoxy, etc.)	

Coating System Inspection Checklist

Step	Description		Name	Signature	Date
1	Completion of cleaning and substrate decontamination prior to abrasive blast cleaning.	GC QC			
		CSM QC			
		CSA QC			
2	Installation of protective enclosure of structure or area and protection of adjacent surfaces or structures that are not to be coated.	GC QC			
		CSM QC			
		CSA QC			
3	Completion of ambient condition control in structure or building area and acceptance of ventilation methods in structure or Area.	GC QC			
		CSM QC			
		CSA QC			
4	Completion of Surface Preparation for Substrates to Be Coated.	GC QC			
		CSM QC			
		CSA QC			
5	Completion of Primer Application.	GC QC			
		CSM QC			
		CSA QC			
6	Completion of Concrete Repairs If Required and Related Surface Preparation Rework Prior to Coating System Application.	GC QC			
		CSM QC			
		CSA QC			
7	Completion of Concrete Filler/ Surface Application to Concrete.	GC QC			
		CSM QC			
		CSA QC			

Coating System Inspection Checklist

Step	Description		Name	Signature	Date
8	Completion of First Finish Coat Application and of Detail Treatment at Transitions or Terminations.	GC QC			
		CSM QC			
		CSA QC			
9	Completion of Second Finish Coat Application and of Detail Treatment at Transitions and Terminations.	GC QC			
		CSM QC			
		CSA QC			
10	Completion of Full and Proper Cure of Coating System.	GC QC			
		CSM QC			
		CSA QC			
11	Completion of Testing of Cured Coating System including Adhesion, Holiday (Continuity) Testing and Dry Film Thickness.	GC QC			
		CSM QC			
		CSA QC			
12	Completion of Localized Repairs to Coating System Following Testing.	GC QC			
		CSM QC			
		CSA QC			
13	Final Acceptance of Coating System Installation Including Final Clean-Up Complying with Specification Requirements and the CSM's Quality Requirements.	GC QC			
		CSM QC			
		CSA QC			

26 05 00-A. WIRE AND CABLE RESISTANCE TEST DATA FORM

Wire or Cable No.: _____ Temperature, °F: _____

Location of Test	Insulation resistance, megohms
1.	
2.	
3.	
4.	
5.	
6.	
7.	

CERTIFIED _____ Date _____

Contractor's Representative

WITNESSED _____ Date _____

Owner's Representative

26 05 00-B. INSTALLED MOTOR TEST DATA FORM

Motor Equipment Number: _____ Date of test: _____

Equipment Driven: _____

MCC Location: _____

				Ambient temp	°F
Resistance:					
Insulation resistance phase-to-ground megohms:					
Phase A		Phase B		Phase C	
Current at Full Load:					
Phase		Current, amps			
Phase		Current, amps			
Phase		Current, amps			
Thermal Overload Device:	Manufacturer/catalog #			Amperes	
Circuit breaker (MCP) setting:					

Motor Nameplate Markings:

Mfr		Mfr Model		Frame		HP	
Volts		Phase		RPM		Service factor**	
Amps		Freq		Ambient temp rating			°C
Time rating				Design letter**			
	(NEMA 1-10.35)				(NEMA MG-1.16)		
Code letter				Insulation class			

**Required for 3-phase squirrel cage induction motors only.

CERTIFIED _____ Date _____

Contractor's Representative

WITNESSED _____ Date _____

Owner's Representative

26 05 00-C. DRY TRANSFORMER TEST DATA FORM

(Note: Use Data Form for dry type transformers with voltage rating of 600 Vac or less and sizes to 167 kVA single phase and 500 kVA three phase. Use NETA Test Forms and Test Procedures for higher voltages and larger transformers.)

Equipment Tag No.: _____ Temperature Rating: _____

Description/Location: _____ Feeder size/Source: _____

Primary Voltage: _____ Secondary Voltage: _____ Winding Connection: _____

A. VISUAL INSPECTION

Transformer Inspection	Pass	Fail	Note
1. Nameplate data as specified			
2. Mechanical condition			
a. Free of dents and scratches			
b. Anchored properly			
c. Shipping brackets removed			
d. Spacing from wall per nameplate			
3. Grounding *			
a. Equipment grounding			
b. System grounding			

B. INSULATION-RESISTANCE TESTS:

Perform tests with calibrated megohmmeter. Apply 1000 Vdc test voltage for 60 seconds and record readings in megohms at 30-seconds and 60-seconds intervals.

Test Group	Resistance between		30-second reading	60-second reading	Absorption Ratio Index 60-sec. / 30-sec.
Primary Winding to ground	A	GRD			
	B	GRD			
	C	GRD			
Secondary Winding to ground with * N-G Bond removed	a	GRD			
	b	GRD			
	c	GRD			
Primary Winding to Secondary Winding	A	a			
	B	b			
	C	c			

Submit resistance readings to the Construction Manager immediately after the tests that are less than the manufacturer's recommended value or less than 10-megohms. Record the Absorption Ratio Index values for future reference. Ratio must be 1.0 or greater, with infinity (∞) equal to 1.0.

Contractor Representative Certified: _____ Date _____

Owner Representative Witnessed: _____ Date _____

26 05 00-D. MOTOR CONTROL CENTER TEST FORM

Equipment No.: _____ Ambient room temperature: _____

Location: _____

A. MECHANICAL CHECK:

All bolted connections either bus to bus or cable to bus shall be torqued to the manufacturer's recommendations.

B. ELECTRICAL TESTS:

1. Measure insulation resistance of each bus section phase to phase and phase to ground for 1 minute using a megohmmeter at 1000 volts.

Test results (megohms)			
Phase		Phase	
A-GRD		A-B	
B-GRD		B-C	
C-GRD		C-A	

2. Set the circuit breaker in the starter unit to comply with the requirements of NEC, Article 430-52 and Table 430-152.
3. Motor overload heater elements shall be sized and installed based on the actual nameplate full load amperes of the motor connected to the starter.

CERTIFIED _____ Date _____

Contractor's Representative

WITNESSED _____ Date _____

Owner's Representative

26 05 00-E. MEDIUM VOLTAGE MOTOR STARTER TEST FORM

Equipment No.: _____

Location: _____

Room Temperature: _____

The protective devices shall be set in accordance with the specification before the tests are performed.

1. Measure contact resistance (micro-ohms)

Phase:	A		B		C	
--------	---	--	---	--	---	--

Contacts shall be replaced if resistance exceeds 50 micro-ohms.

2. Perform an insulation resistance test (1000 volts DC for 1 minute).

Phase	A		B		C		
Pole to ground							megohms
Across open pole							megohms
Pole to pole	AB		BC		CA		megohms

3. Perform minimum pickup voltage tests on trip and close coils.
4. Motor RTDs shall be tested by using a hot oil bath. The temperature at which the sensor trips shall be recorded for each RTD.
5. The Contactor shall be tripped by operation of each protective device.

26 05 00-F. MEDIUM VOLTAGE SWITCHGEAR TEST FORM

Equipment No.: _____

Location: _____

Room Temperature: _____

The protective devices shall be set in accordance with the specification before the tests are performed.

1. Measure contact resistance (micro-ohms).

Phase:	A		B		C	
--------	---	--	---	--	---	--

Contacts shall be replaced if resistance exceeds 50 micro-ohms.

2. Perform an insulation resistance test (1000 volts DC for 1 minute).

Phase	A		B		C		
Pole to ground							megohms
Across open pole							megohms
Pole to pole	AB		BC		CA		megohms

3. Perform minimum pickup voltage tests on trip and close coils.
4. Verify the instrument transformer ratios. Check the transformer's polarity electrically.
5. The Contactor shall be tripped by operation of each protective device.

26 05 00-G. PROTECTIVE RELAY TEST FORM

Location: _____

Switchgear Breaker No.: _____

Protective Relay Description: _____

The protective relays shall be tested in the following manner:

1. Each protective relay circuit shall have its insulation resistance tested to ground.
2. Perform the following tests on the specified relay setting:
 - a. Pickup parameters on each operating element.
 - b. Timing test shall be performed at three points on the time dial curve.
 - c. Pickup target and seal-in units.

The results shall be recorded and signed. A copy shall be given to the Construction Manager in accordance with paragraph 26 05 00-1.05 Corrosive Areas.

26 05 00-H. LOW VOLTAGE SWITCHGEAR TEST FORM

Equipment No.: _____

Location: _____

Room Temperature: _____

The protective devices shall be set in accordance with the specification before the tests are performed.

1. Measure contact resistance (micro-ohms).

Phase:	A		B		C	
--------	---	--	---	--	---	--

Contacts shall be replaced if resistance exceeds 50 micro-ohms.

2. Perform an insulation resistance test (1000 volts DC for 1 minute).

Phase	A		B		C		
Pole to ground							megohms
Across open pole							megohms
Pole to pole	AB		BC		CA		megohms

3. Minimum pickup current shall be determined by primary current injection.
4. Long time delay shall be determined by primary injection at three hundred percent (300%) pickup current.
5. Short time pickup and time delay shall be determined by primary injection of current.
6. Instantaneous pickup current shall be determined by primary injection.
7. Trip unit reset characteristics shall be verified.
8. Auxiliary protective devices, such as ground fault or under voltage relays, shall be activated to ensure operation of shunt trip devices.

26 05 00-I. MEDIUM VOLTAGE LOAD INTERRUPTER SWITCH TEST FORM

Equipment Number: _____

Location: _____

Date: _____

1. Measure switch blade resistance (micro-ohms).

Phase:	A		B		C	
--------	---	--	---	--	---	--

Contacts shall be replaced if resistance exceeds 50 micro-ohms.

2. Perform an insulation resistance test (1000 volts DC for 1 minute).

Phase	A		B		C		
Pole to ground							megohms
Across open pole							megohms
Pole to pole	AB		BC		CA		megohms

The results shall be recorded and signed. A copy shall be given to the Construction Manager in accordance with paragraph 26 05 00-2.06 Product Data.

CERTIFIED _____ Date _____
Contractor's Representative

WITNESSED _____ Date _____
Owner's Representative

26 05 00-J. LIQUID-FILLED TRANSFORMER TEST FORM

Equipment Number: _____

Location: _____

Date/Weather Conditions: _____

- A. Perform the "Insulation-Resistance Test" and "Dielectric Absorption Test" using Form 26 05 00-C, Dry Transformer Test Data Form.
- B. Perform an applied voltage (low frequency dielectric) test in accordance with ANSI C57.12.90, paragraph 10.5, Applied Voltage Test. Applied voltage levels shall be 75 percent of recommended factory test levels or recommended test levels of ANSI C57.12.00, Table 5.
- C. Insulating oil shall be sampled and shall be laboratory tested for the following:
 - 1. Dielectric strength.
 - 2. Acid neutralization.
 - 3. Interfacial tension.
 - 4. Color.
 - 5. Power factor.
- D. Perform a turns ratio test between the windings for all tap positions.
- E. The temperature and pressure switches shall be tested using a hot oil bath and air pump.
- F. The results shall be recorded and signed by the Contractor and Construction Manager. A copy shall be given to the Construction Manager in accordance with paragraph 26 05 00-2.06 Product Data. Any readings which are abnormal to ANSI industry standards shall be reported to the Construction Manager.

26 05 00-K. AUTOMATIC TRANSFER SWITCH TEST FORM

Equipment Number: _____

Location: _____

Date: _____

1. Perform an insulation resistance test (1000 volts DC for 1 minute):

Phase	A		B		C		
Pole to ground							megohms
Pole to pole	AB		BC		CA		megohms

2. Perform the following operations and initial:
 - a. Manual transfer _____
 - b. Loss of normal power; __sec delay
 - c. Return to normal power; _____sec delay

The results shall be recorded and signed. A copy shall be given to the Construction Manager in accordance with paragraph 26 05 00-2.06 Product Data.

CERTIFIED _____ Date _____
Contractor's Representative

WITNESSED _____ Date _____
Owner's Representative

26 05 00-L. NEUTRAL GROUNDING RESISTOR TEST

Equipment No.: _____

Location: _____

The pickup and time delay setting on the ground fault relay shall be set in accordance with Section 26 05 74.

1. The transformer neutral insulation resistance shall be measured with and without the grounding resistor connected to insure no parallel ground paths exist.
2. The protective relay pickup current shall be determined by injecting test current into the current sensor. The pickup current should be within 10 percent of the dial setting. Record the dial setting and actual pickup tie.
3. The relay timing shall be tested by injecting 150 and 300 percent of pickup current into the current sensor. The relay timing shall be in accordance with the manufacturer's published time-current characteristic curves. Record the relay timing at 150 and 300 percent of pickup current.
4. The circuit interrupting device shall be operated by operating the relay.

The results shall be recorded and signed by the Contractor and Construction Manager. A copy shall be given to the Construction Manager in accordance with paragraph 26 05 00-2.06 Product Data.

40 61 13-A. LOOP WIRING AND INSULATION RESISTANCE TEST DATA FORM

Loop No.: _____

List all wiring associated with a loop in table below. Make applicable measurements as indicated after disconnecting wiring.

Wire No.	Panel Tie	Field TB	Continuity Resistance ^a		Insulation Resistance ^b			
			Cond./ Cond.	Cond./ Shield	Shield/ Gnd.	Shield/ Cond.	Cond./ Gnd.	Shield/ Shield
A			--	(A/SH)				
B			(A/B)	--				
C			(A/C)	--				
D			(A/D)	--				
etc.								

NOTES:

- a. Continuity Test. Connect ohmmeter leads between wires A and B and jumper opposite ends together. Record resistance in table. Repeat procedure between A and C, A and D, etc. Any deviation of ± 2 ohms between any reading and the average of a particular run indicates a poor conductor, and corrective action shall be taken before continuing with the loop test.
- b. Insulation Test. Connect one end of a 500 volt megger to the panel ground bus and the other sequentially to each completely disconnected wire and shield. Test the insulation resistance and record each reading.

CERTIFIED _____ Date _____

Contractor's Representative

WITNESSED _____ Date _____

Owner's Representative

40 61 13-B. CONTROL CIRCUIT PIPING LEAK TEST FORM

Loop No.: _____

List tubing associated with loop in table below. Make applicable measurements after isolating any air consuming pilots from circuit.

Tube No.	Tubing Equivalent Length of 1/4-Inch Copper ^a	Test Period (seconds)	Permitted Pressure Drop (psi) ^b	Measured Pressure Drop (psi)
A				
B				
C				
D				
etc.				

NOTES:

- a. Convert actual tubing and air motor volume to equivalent 1/4-inch copper tubing.
- b. Pressure drop shall not exceed 1 psi per hundred feet 1/4-inch tubing per 5 seconds.

CERTIFIED _____ Date _____
 Contractor's Representative

WITNESSED _____ Date _____
 Owner's Representative

40 61 13-C. CONTROLLER CALIBRATION TEST DATA FORM

Tag No. and Description: _____

Make & Model No.: _____ Serial No.: _____

Input: _____ Process Variable (PV) Scale: _____

Output: _____ Output Scale: _____

PV Scale Calibration

% of Range	Input	Expected Reading	Actual Reading	% Deviation
0				
50				
100				
% Deviation Allowed:				

Connect output to PV for following tests:

Set Point (SP) Indicator Accuracy			Output Meter Accuracy			Controller Accuracy		
SP	PV Reading	Expected % Dev.	Actual Reading	Expected Reading	Actual % Dev.	OUTPUT	OUTPUT	% Dev.
(0%)								
(50%)								
(100%)								
% Deviation Allowed:			% Deviation Allowed:			% Deviation Allowed:		

CERTIFIED _____ Date _____

Contractor's Representative

WITNESSED _____ Date _____

Owner's Representative

40 61 13-D. PANEL INDICATOR CALIBRATION TEST DATA FORM

Tag No. and Description: _____

Make & Model No.: _____ Serial No.: _____

Input: _____

Scale: _____ Range: _____

PV Scale Calibration

% of Range	Input	Expected Reading	Actual Reading	% Deviation
0				
50				
100				
% Deviation Allowed:				

CERTIFIED _____ Date _____

Contractor's Representative

WITNESSED _____ Date _____

Owner's Representative

40 61 13-E. RECORDER CALIBRATION TEST DATA FORM

Tag No. and Description: _____

Make & Model No.: _____ Serial No.: _____

Input: _____ Chart: _____

Scale: _____ Range: _____

% of Range	Input	Expected Reading	Actual Reading	% Deviation
0				
50				
100				
% Deviation Allowed:				

CERTIFIED _____ Date _____

Contractor's Representative

WITNESSED _____ Date _____

Owner's Representative

40 61 13-F. SIGNAL TRIP CALIBRATION TEST DATA FORM

Tag No. and Description: _____

Make & Model No.: _____ Serial No.: _____

Input: _____

Scale: _____ Range: _____

Set Point(s): _____

After setting set point(s), run signal input through entire range and calculate deadband.

Set Point	Incr. Input Trip Point	Decr. Input Trip Point	Calc. Deadband	Required Deadband

CERTIFIED _____ Date _____
Contractor's Representative

WITNESSED _____ Date _____
Owner's Representative

40 61 13-G. FIELD SWITCH CALIBRATION TEST DATA FORM

Tag No. and Description: _____

Make & Model No.: _____ Serial No: _____

Input: _____

Range: _____

Set Point(s): _____

Simulate process variable (flow, pressure, temperature, etc.) and set desired set point(s). Run through entire range of switch and calculate deadband.

Set Point	Incr. Input Trip Point	Decr. Input Trip Point	Calc. Deadband	Required Deadband

CERTIFIED _____ Date _____

Contractor's Representative

WITNESSED _____ Date _____

Owner's Representative

40 61 13-H. TRANSMITTER CALIBRATION TEST DATA FORM

Tag No. and Description: _____

Make & Model No.: _____ Serial No.: _____

Input: _____

Output: _____

Range: _____ Scale: _____

Simulate process variable (flow, pressure, temperature, etc.) and measure output with appropriate meter.

% of Range	Input	Expected Reading	Actual Reading	% Deviation
0				
50				
100				
% Deviation Allowed:				

CERTIFIED _____ Date _____

Contractor's Representative

WITNESSED _____ Date _____

Owner's Representative

40 61 13-I. MISCELLANEOUS INSTRUMENT CALIBRATION TEST DATA FORM

(For instruments not covered by any of the preceding test forms, the Contractor shall create a form containing all necessary information and calibration procedures.)

CERTIFIED _____ Date _____
Contractor's Representative

WITNESSED _____ Date _____
Owner's Representative

40 61 13-J. INDIVIDUAL LOOP TEST DATA FORM

Loop No.: _____

Description: (Give complete description of loop's function using tag numbers where appropriate.)

P&ID No.: (Attach copy of P&ID.)

- a. Wiring tested:
(Attach test form 40 61 13-A)
- b. Instrumentation tubing/piping tested:
(Attach test form 40 61 13-B)
- c. Instruments calibrated:
(Attach test forms 40 61 13-C through I)
- d. List step-by-step procedures for testing loop parameters. Test loop with instruments, including transmitters and control valves, connected and functioning. If it is not possible to produce a real process variable, then a simulated signal may be used with the Construction Manager's approval.

CERTIFIED _____ Date _____
Contractor's Representative

WITNESSED _____ Date _____
Owner's Representative

40 61 13-K. LOOP COMMISSIONING TEST DATA FORM

Loop No.: _____

- a. Loop tested:
(Attach test form 40 61 13-J)
- b. Controlled or connected equipment tests confirmed:
- c. Give complete description of loop's interface with process.
- d. With associated equipment and process in operation, provide annotated chart trace of loop response to changes in set points for verification of performance. This chart should demonstrate 1/4-amplitude damping as output adjusts to set point change. Show set points, starting and finishing times on chart, as well as any other pertinent data.

Connect 2-pen recorder to process variable (PV) and to controller output. Use 1 inch/second chart speed.

Pen 1 - PV - Connections:
Pen 2 - Output - Connections:

CERTIFIED _____ Date _____
Contractor's Representative

WITNESSED _____ Date _____
Owner's Representative

43 05 11-A. MANUFACTURER'S INSTALLATION CERTIFICATION FORM

Contract No: _____ Specification section: _____

Equipment name: _____

Contractor: _____

Manufacturer of equipment item: _____

The undersigned manufacturer of the equipment item described above hereby certifies that he has checked the installation of the equipment and that the equipment, as specified in the project manual, has been provided in accordance with the manufacturer's recommendations, and that the trial operation of the equipment item has been satisfactory.

Comments: _____

Manufacturer

Contractor

Signature of Authorized Representative

Signature of Authorized Representative

Date

Date

43 05 11-B. MANUFACTURER'S INSTRUCTION CERTIFICATION FORM

Contract No: _____ Specification Section: _____

Equipment name: _____

Contractor: _____

Manufacturer of equipment item: _____

The undersigned manufacturer certifies that a service engineer has instructed the wastewater treatment plant operating personnel in the proper maintenance and operation of the equipment designated herein.

Operations Check List (check appropriate spaces)

Start-up procedure reviewed	
Shutdown procedure reviewed	
Normal operation procedure reviewed	
Others:	

Maintenance Check List (check appropriate spaces)

Described normal oil changes (frequency)	
Described special tools required	
Described normal items to be reviewed for wear	
Described preventive maintenance instructions	
Described greasing frequency	
Others:	

Manufacturer

Signature of Contractor Representative Date

Signature of Authorized Representative

Date

Signature of Authorized Representative Date

43 05 11-C. UNIT RESPONSIBILITY CERTIFICATION FORM

[PROJECT TITLE]

CERTIFICATE OF UNIT RESPONSIBILITY
FOR SPECIFICATION SECTION _____

[SECTION TITLE]

In accordance with Section 43 05 11-1.02 Unit Responsibility of the contract documents, the undersigned manufacturer of driven equipment ("manufacturer") accepts unit responsibility for all components of equipment furnished to the Project under specification Section _____, and for related equipment manufactured under sections _____, _____, and _____.

We have reviewed the requirements for sections 43 05 11 and 43 23 03 where applicable) and all sections referencing this (these) section(s), including but not limited to drivers, supports for driving and driven equipment and all other specified appurtenances to be furnished to the Project by manufacturer. And, we have further reviewed, and modified as necessary, the requirements for associated variable speed drives and motor control centers. We hereby certify that all specified components are compatible and comprise a functional unit suitable for the specified performance and design requirements whether or not the equipment was furnished by us. We will make no claim nor establish any condition that problems in operation for the product provided under this specification Section _____ are due to incompatibility of any components covered by this Certificate of Unit Responsibility. Nor will we condition or void any warranty for the performance of the product of this specification Section _____ due to incompatibility of any components covered under this Certificate of Unit Responsibility.

Our signature on this Certificate of Unit Responsibility does not obligate us to take responsibility for, nor to warrant the workmanship, quality, or performance of related equipment provided by others under specification sections _____, _____, and _____. Our obligation to warranty all equipment provided by us shall remain unaffected.

Notary Public

Name of Corporation

Commission expiration date

Address

Seal:

By:

Duly Authorized Official

Legal Title of Official

Date

43 05 13-A. RIGID EQUIPMENT MOUNT INSTALLATION CHECKLIST

[CLIENT, PROJECT NAME]

Equipment Tag No.: _____ Date: _____

Grout Product Name and Type: _____

Grouting System Manufacturer: _____

Grouting Application Contractor: _____

General Contractor: _____

Step 1: Verify Equipment Anchor Installation Conformance to Equipment Pad Details

Name: Contractor Rep.		Date
Name: Construction Manager		Date
Name: Millwright		Date

Step 2: Completion of Cleaning and Concrete Substrate Preparation Prior to Grouting

Name: Contractor Rep.		Date
Name: Construction Manager		Date
Name: Grouting Contractor Rep.		Date
Name: Grout Manufacturer's Technical Rep.		Date

Step 3: Equipment Leveling

Name: Contractor Rep.		Date
Name: Construction Manager		Date
Name: Millwright		Date

Step 4: Installation of Protection of Adjacent Surfaces or Structures NOT TO BE GROUTED

Name: Contractor Rep.		Date
Name: Construction Manager		Date
Name: Grouting Contractor Rep.		Date
Name: Grout Manufacturer's Technical Rep.		Date

Step 5: Preparation and Construction of Forms and Epoxy Grout Filling Standpipes

Name: Contractor Rep.		Date
Name: Construction Manager		Date
Name: Grouting Contractor Rep.		Date
Name: Grout Manufacturer's Technical Rep.		Date

Step 6: Completion of Ambient Condition Control in Structure or Building Area and Acceptance of Ambient Conditions as They Apply to Application and Curing Requirements for the Grouting System

Name: Contractor Rep.		Date
Name: Construction Manager		Date
Name: Grouting Contractor Rep.		Date
Name: Grout Manufacturer's Technical Rep.		Date

Step 7: Epoxy Grout Installation

Name: Contractor Rep.		Date
Name: Construction Manager		Date
Name: Grouting Contractor Rep.		Date
Name: Grout Manufacturer's Technical Rep.		Date

Step 8: Completion of Full and Proper Cure of Epoxy Grout

Name: Contractor Rep.		Date
Name: Construction Manager		Date
Name: Grouting Contractor Rep.		Date

Name: Grout Manufacturer's Technical Rep.		Date
---	--	------

Step 9: Completion of Localized Repair of Grout Voids

Name: Contractor Rep.		Date
-----------------------	--	------

Name: Construction Manager		Date
----------------------------	--	------

Name: Grouting Contractor Rep.		Date
--------------------------------	--	------

Name: Grout Manufacturer's Technical Rep.		Date
---	--	------

Step 10: Final Acceptance of Grouting System Installation Including Final Clean-Up of the Work Site Complying with All Specification Requirements and the GSM's Quality Requirements

Name: Contractor Rep.		Date
-----------------------	--	------

Name: Construction Manager		Date
----------------------------	--	------

Name: Grouting Contractor Rep.		Date
--------------------------------	--	------

Name: Grout Manufacturer's Technical Rep.		Date
---	--	------

43 05 21-A. MOTOR DATA FORM

Equipment Name: _____ Equipment No(s): _____

Project Site Location: _____

Nameplate Markings

Mfr:	Mfr Model:	Frame:	Horsepower:
Volts:	Phase:	RPM:	Service Factor:
FLA:	LRA:	Frequency:	Amb Temp Rating: °C
Time rating:	(NEMA MG1-10.35)	Design Letter:	(NEMA MG-1.16)
KVA Code Letter:		Insulation Class:	

The following information is required for explosion-proof motors only:

- A. Approved by UL for installation in Class _____, Div _____, Group _____
- B. UL frame temperature code _____ (NEC Tables 500-8B)

The following information is required for all motors 1/2 horsepower and larger:

- A. Guaranteed minimum efficiency _____
(Section 43 05 21-2.04 Motor Efficiency)
- B. Nameplate or nominal efficiency _____

Data Not Necessarily Marked on Nameplate

Type of Enclosure:	Enclosure Material:
Temp Rise:	°C (NEMA MG1-12.41,42)
Space Heater included?	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes:	Watts Volts
Type of motor winding over-temperature protection, if specified:	

Provide information on other motor features specified:

Membrane Type:

Manufacturer:

Installation Date:

Life span:

Required Maintenance:

Warranty Information:

Supplier Information:

Pump and Motor Information:

Valve information:

Membrane Housing Material:

Quantity of filters:

Instrumentation informtaion :

Type of instrument

Range

Calibration

Brand

VFD

size

Brand

PLC

Brand

Communication type

Type of card and number of cards

If applicable

EXCEL FORMAT FOR DOCUMENTATION OF EQUIPMENT AND SPARE PARTS (ELECTRONIC FILE TO BE PROVIDED BY CITY)

Name

Quantity

Shelf Life

SECTION 46 63 11

MEMBRANE ELEMENTS AND MEM'S SERVICES

PART 1 - GENERAL

1.01 THE REQUIREMENT

- A. The scope of work under this contract includes the manufacture of the specified nanofiltration membrane elements to replace the existing membrane elements. All equipment and services specified in this Specification Section 46 63 11 shall be provided by the Membrane Element Manufacturer (MEM), unless explicitly specified to be provided by the CONTRACTOR. The MEM shall be Hydranautics.
- B. The CONTRACTOR shall be responsible for installation, startup, and performance testing of the membranes.
- C. The CONTRACTOR shall provide all replacement parts necessary for a reliable, leak-free, membrane installation. The replacement parts shall require the replacement of some vessel parts, end cap assembly parts and all seals and O-rings described in these specifications.
- D. The MEM shall be responsible for furnishing and supervising installation of the membrane elements and for conducting a seven-day performance test of each unit after installation of the membranes which shall comply with the permeate quality, flow rates, and net driving pressure specified in Section 01 77 55, Tables 01 77 55-1 and 01 77 55-2

1.02 RELATED WORK

- A. Section 01 77 55: Membrane System Performance Warranty.
- B. Section 46 63 23: Membrane System Equipment and Installation.
- C. Qualifications: The proposed membrane model and version shall have been installed in at least two other large membrane water treatment plants (greater than 5.0 mgd in capacity), and are operating successfully.

1.03 DEFINITIONS

- A. The terms used herein shall have the meanings assigned in Section 01 77 55 and other sections of the Contract Documents.

1.04 SUBMITTALS

- A. After award of contract during shop drawing submittals, submit five copies of the following:

1. Membrane system process projections for years 1, 2, and 3 using the latest version of the membrane process projection software tailored for the City of Hollywood membranes to be supplied under this Contract.
2. The software version used to make the process projections listed above.
3. Complete description of physical characteristics including information on brine seals, O-rings, external wrap, average net effective membrane area per element, connector pieces including inter-element as well as feed, concentrate and permeate stream connectors to pressure vessel end caps, materials of construction, and all dimensions.
4. List of necessary and recommended spare parts and tools.
5. List of necessary or recommended replacement parts for the vessels, vessel end caps, and all seals and O-rings that should be replaced during the membrane replacement.
6. Membrane element performance specification sheet and the following characteristics for each offered membrane model: solute and water mass transfer coefficients, solute rejection, maximum allowable feed pressures, feed channel pressure loss, maximum and minimum flow rates, and other appropriate information for both normal operation as well as cleaning and flushing conditions.
7. Membrane Element Manufacturer's printed instructions for the handling, storage, installation, maintenance, pickling, of the membrane elements.
8. The membrane tolerance for both free chlorine and chloramine in terms of maximum ppm-hours aggregate exposure and maximum instantaneous concentrations.
9. Instructions and limits for a chloramine cleaning procedure. Provide guidelines and limitations on using chloraminated water for flushing membranes on a periodic basis.
10. A description of recommended cleaning procedures and generic cleaning solutions for inorganic fouling, organic fouling, and bacterial fouling conditions, with detailed instructions for preparing the cleaning solutions and including a list of specific cleaning and disinfection compounds that should not be used.
11. In-situ storage and preservation procedures for short-term and long-term layup of the membrane units.
12. A complete operating manual for the furnished membrane element model(s).
13. The Wet Bench Test protocol for each element model and test results for each membrane element as specified in Paragraphs 1.05, Item B of this Section. Also provide correlations between the Wet Bench Test performance and the

Membrane Process Projections provided as a submittal document to OWNER and ENGINEER, using software version provided under this section.

14. Provide the latest version of the MEM's computer software for calculating and normalizing membrane performance data for each membrane unit. The MEM's current software, shall be modified to provide membrane performance charts for the following and titled as shown below:
 1. "Unit #: Permeate Flows" (include stages 1, 2, and 3 and unit total permeate flow, on same chart)
 2. "Unit #: Feed Pressures" (stages 1, 2, and 3 on same chart)
 3. "Unit #: Permeate Conductivities" (stages 1, 2, and 3 plus combined total permeate on same chart)
 4. "Unit #: Normalized Salt Passage" (stages 1, 2, and 3)
 5. "Unit #: Normalized Permeate Flow" (stages 1, 2, and 3)
 6. "Unit #: Normalized Differential Pressure" (stages 1, 2, and 3)
 7. "Unit #: Normalized Specific Flux" (stages 1, 2, and 3)

1.05 QUALITY ASSURANCE

- A. To the greatest extent possible for each unit of Work, the MEM shall provide products or materials of a singular generic kind from a single source. The word "Products," as used herein, is defined to include purchased items for incorporation into the Work, regardless of whether specifically purchased for this project or taken from the MEM's stock of previously purchased products. The word "Materials," as used herein, is defined as products which must be substantially cut, shaped, worked, mixed, finished, refined, or otherwise fabricated, processed, installed, or applied to form units of work
- B. Wet Bench Test. For each membrane element supplied under this Contract, the MEM shall perform a wet bench test at the factory prior to shipping the membranes. The test shall be at standard test conditions as described in the CONTRACTOR's membrane specification sheet. The test results shall document permeate flow, and salt rejection along with the serial number. The OWNER reserves the right to have all or a portion of the bench scale tests witnessed by the ENGINEER.
- C. Membrane Technician. The MEM's field services during loading, start-up, and performance testing, and specified field services during the warranty period, shall be provided by a qualified Membrane Technician. The Membrane Technician shall meet the following minimum qualifications and experience:
 1. The Membrane Technician shall have a minimum of 15 years' experience in potable water membrane treatment plant installation, start-up, and operations.
 2. The Membrane Technician shall have provided services similar to those specified under this contract for a minimum of five potable water nanofiltration treatment plants with a capacity of at least 7 mgd in Florida.

1.06 MEMBRANE SYSTEM PERFORMANCE WARRANTY

- A. The MEM shall warranty the performance of the membrane in accordance with the provisions of Contract Documents and Section 01 77 55.
- B. The membrane system shall be designed to satisfy the requirements of this specification and Section 01 77 55, Membrane System Performance Warranty.
- C. If the membranes fail to meet the performance warranty, The MEM shall make all corrective actions promptly upon receipt of written order from the OWNER as specified in Section 01 77 55, Paragraph 1.09. If the MEM fails to make such corrective actions promptly, the OWNER reserves the right to take corrective actions and the MEM shall be liable to the OWNER for the cost thereof.

1.07 MEMBRANE SYSTEM DESIGN

- A. The membrane system is designed to treat raw water from the OWNER's surficial Biscayne aquifer wells. The membrane system shall meet the design criteria listed and described in Tables 01 77 55-1 and 01 77 55-2. Failure to meet all required design criteria at the time of membrane performance testing will allow the OWNER to take actions as specified further in this Section and the Contract Documents.

PART 2 PRODUCTS

2.01 MEMBRANE ELEMENTS

- A. Membrane elements shall be non-cellulosic, spiral-wound, thin film composite membrane, 8 inches in diameter, and 40 inches in length (nominal). Each element shall contain an average of 400 square feet of active membrane area (Area exposed to the feed and permeate).
- B. The membranes provided by the MEM shall perform in strict accordance with Table 01 77 55-1 and Table 01 77 55-2 contained in Section 01 77 55.
- C. The total quantity of membrane elements to be provided under this contract is as follows:

Seven (7) membrane units x 366 elements per unit:	2,562 elements
Spare membrane elements (for 2:1 array pilot unit):	21 elements
Total number of membrane elements:	2,583 elements
- D. Membrane elements shall have filament wound fiberglass shells and shall be supplied with brine seals, interconnectors, and O-rings.

PART 3 EXECUTION

3.01 MEM'S PROVIDED SERVICES

- A. The MEM shall be responsible for the following:
1. Performance of the membrane elements and their ability to meet the specified productivity and water quality goals.
 2. The CONTRACTOR shall coordinate with the OWNER regarding scheduling for receiving, storing, handling, and loading of the membrane elements for each unit so as to minimize disruptions to existing plant operations.
 3. The MEM shall provide the services of an experienced Membrane Technician. The Membrane Technician shall be present on-site during the installation of all the membrane elements into the membrane units in order to supervise the installation and certify that its membrane elements were correctly installed.
 4. Provide services during performance testing of the membrane system as outlined in Paragraph 3.08.
 5. Provide the OWNER with a complete operating manual including element data sheets, performance projections, proper instructions for installing the membranes, cleaning the membrane elements, handling, storage, preserving and flushing preservatives from the membrane, taking and recording data, and calculating normalized system performance. A paper copy and an electronic file format of the operating manual shall be provided.
 6. During the term of the warranty, review monthly performance reports provided by the OWNER and immediately alert the OWNER of any operational problems that may impact the system warranty. The MEM shall issue a quarterly letter to the OWNER containing its comments.
 7. Send a qualified Membrane Technician to the facility at least quarterly during the first year of operation and once per year for the remainder of the term of the warranty to review the operation and maintenance with the OWNER and its designated ENGINEER.
 8. Keep the OWNER informed of any changes in the operation and maintenance manual that may develop during the term of the warranty.
 9. During the term of the warranty, review requests of the OWNER to evaluate and approve alternate scale inhibitors or cleaning agents in the event better or less costly products become available.
 10. Provide on-site training to the OWNER's staff on membrane processes, performance monitoring, performance normalization, installation, cleaning, troubleshooting of membrane in accordance with the section entitled "Membrane System Training".

3.02 MEM SERVICES TO BE PROVIDED DURING PERFORMANCE TESTING

The MEM shall provide the services of a qualified Membrane Technician for the duration of the Performance Testing. During this period, the MEM's representative shall:

- A. Be present on site full-time (8-hours per business day) during the time when any membrane unit is out of service (e.g., during unloading of the existing membrane elements and loading of the new membrane elements). In addition, the Membrane Technician shall be on site at least three days during the 7-day performance test for each unit.
- B. Review and provide comments on procedures for correlating conductivity, TDS, and hardness data for normalization of membrane system performance data.
- C. Review and provide comments on the interim and 7-day performance test reports for each unit.
- D. Take corrective action as required in Section 3.08, paragraph G.
- E. Providing operator training as described in "Membrane System Training", Section 3.09

3.03 MEMBRANE DELIVERY SCHEDULE

- A. Membrane elements shall be delivered to the site in individual shipments of not more than two membrane units of elements at a time. Because space in the process bay available for storage of membrane elements is limited, the CONTRACTOR shall not store more than three membrane units worth of membrane elements on the site at a time.

3.04 TRANSPORT AND DELIVERY

- A. The membrane elements shall be transported and delivered in an undamaged condition in the MEM's unopened containers or packaging. The OWNER shall be provided with ten (10) calendar days' advance notice via certified mail prior to shipment, and 48 hours advance written notice prior to delivery from the MEM. A copy of the notices shall be provided to the ENGINEER.
- B. Membranes shall be shipped with a recording thermometer and membranes shall not be exposed to temperatures outside of the MEM's recommended temperature limits as described in their technical bulletin. Thermometers must be reviewed by the ENGINEER/OWNER upon arrival at the water treatment plant.
- C. The OWNER and/or ENGINEER shall jointly record the delivery of the membrane elements at the project site with the CONTRACTOR and inspect for completeness and evidence of damage during shipment
- D. After completion of the joint inspection, the membrane elements shall be unloaded by the CONTRACTOR. Damaged membrane elements will be returned to the MEM for replacement and will not be unloaded, except as necessary to expedite return shipment. Damaged membrane elements shall be promptly replaced with new identical membrane elements. Any damage or loss shall be reported in writing to the ENGINEER and the OWNER.

3.05 CONTRACTOR'S RESPONSIBILITY PERTAINING TO THE MEMBRANE ELEMENT HANDLING AND STORAGE

- A. Following unloading the membrane, and until final acceptance of the completed Work, the CONTRACTOR shall protect and maintain the membrane elements to prevent damage.
- B. If there is damage to or loss of membrane elements during storage the damaged or lost membrane shall be promptly documented and replaced with new.

3.06 MEMBRANE ELEMENT PRE-INSTALLATION MEETING

- A. Prior to installation of the membranes CONTRACTOR/MEM, OWNER and ENGINEER shall hold a meeting to review the procedure for installation of the membrane elements into the membrane units. Representatives from the ENGINEER and the OWNER will also attend the meeting.

3.07 INSTALLATION OF MEMBRANE ELEMENTS

- A. The CONTRACTOR shall install the replacement membranes in accordance with Section 46 63 23.
- B. The MEM shall have a representative on-site during installation of all the membrane elements into the membrane units to provide supervision and to certify that the membrane elements have been installed correctly.
- C. Installation of membrane elements shall fully conform to the MEM's recommended procedures, instructions, and approved shop drawings.
- D. If the MEM requires that the membranes be loaded in a specific order, they shall provide this information in writing to the installing Contractor and pack and ship the elements in a manner that is consistent with the loading schedule. The MEM's on-site representative shall assist the installing Contractor with coordinating the loading schedule.
- E. The CONTRACTOR shall provide all supervision, labor, tools, construction equipment, incidental materials, and necessary services required to install the membrane elements.
- F. To prevent bacteriological contamination of the membranes, the CONTRACTOR shall ensure that unpackaged membrane elements are not placed in direct contact with the ground, floor, standing water, or dirt, and will instruct installers to maintain sanitary and clean conditions. Procedures for maintaining sanitary conditions shall be submitted to the ENGINEER for approval.

3.08 MEMBRANE SYSTEM PERFORMANCE ACCEPTANCE TESTING

- A. Performance testing of each NF unit shall be conducted upon completion of membrane loading and start-up of the unit. In addition to the data collection and reporting requirements specified herein, each performance test report shall include "before" and "after" digital photographs from at least four different perspectives of the respective NF

unit. "Before" photographs shall be representative of the existing conditions and be taken prior to any work being performed on the unit (prior to disassembly of the unit for pressure vessel replacement). "After" photographs shall be taken from the same perspectives as "before," and be taken immediately after the NF unit has been placed into service at the beginning of testing. Final acceptance of the membrane system and membrane elements will be contingent upon successful completion of the performance testing.

- B. Performance testing of the membrane system shall be scheduled by the CONTRACTOR unless the OWNER does not have enough demand to operate the number of units requested for testing by the CONTRACTOR. If there is not enough demand to run all the units under performance testing, the units will have to be rotated on and off.

Each membrane unit shall be tested under the conditions specified in Part I, Paragraph 1.07 of this section, and the terms of the Warranty, Section 01 77 55, and those conditions must be maintained throughout the entire performance test.

- C. Data Collection and Reporting Requirements

1. The following data will be collected automatically by the MEM through the HMI and recorded on an hourly basis during the 7-day membrane performance test, or on a shift basis if the data is not captured by the HMI.

Overall Membrane System:

- Permeate pressure in manifold or downstream of all valves on each unit.
- Feed water temperature
- Feed conductivity
- Feed water pH
- Feed water ORP
- Feed water turbidity
- Concentrate manifold pressure

Each Membrane Unit:

- Run Time
- First stage feedwater pressure, downstream all valves, prior to membranes.
- Second stage feed pressure
- Second stage concentrate pressure
- First stage permeate pressure
- Total permeate pressure
- Total permeate flow
- Second stage permeate flow
- First stage permeate flow (by difference)
- Second stage Concentrate flow
- Total permeate pressure up stream of valves
- Concentrate conductivity
- Total Permeate pH

2. Readings to be taken manually by the MEM with calibrated instrument every eight (8) hours include:
 - a. Unit total permeate hardness (very important). (note, always measure conductivity of this sample prior to titration)
 - b. Measure the following two conductivity samples with same calibrated Myron L meter:
 - i. Unit total permeate conductivity (very important)
 - ii. Feed conductivity (very important)
 - c. Post cartridge filter SDI (once per shift)
 - d. Stage 2 concentrate conductivity
 - e. Permeate pH (prior to post-treatment)

3. The following performance parameters for each unit performance test shall be plotted against total time of operation in hours by the MEM on a daily basis.
 - a. First and second stage normalized water mass transfer coefficient (also known as specific flux),
 - b. First and second stage normalized delta pressure
 - c. First and second stage, plus total normalized permeate flow
 - d. First and second stage, and total permeate conductivity.

D. Water Quality Sampling

Samples shall be collected and analyzed by the CONTRACTOR using a State of Florida certified laboratory, during performance testing for each individual membrane unit. During a sampling event, the CONTRACTOR will collect discrete water samples of the feed water from the feed water panel, each unit's total permeate, and concentrate streams for all the parameters listed in Table 46 63 11-2 of this Section. The analytical laboratory shall utilize analytical methodologies, approved by the USEPA or contained in Standard Methods (latest edition), that has a detection limit sufficiently sensitive to allow determination of compliance with the stated performance requirements. It is anticipated that all analyses will be completed within seven (7) days after sample collection, earlier if possible.

Prior to the start of performance testing the CONTRACTOR will take samples from the feed, permeate, and concentrate and have the samples analyzed for conductivity, TDS, and hardness in order to develop correlations between these parameters.

- E. The OWNER shall use the results of the laboratory water analyses to determine whether the membrane system passes the performance testing requirements. If the unit's water samples for the membrane product water fail to meet the required value ranges as listed in Table 01 77 55-1, and the operational criteria specified in Part I, Paragraph 1.07 of this Section, the performance test shall be considered failed as described in paragraph G, *Failure to Meet Performance Testing Requirements*.

F. Performance Test Acceptance Criteria

1. Individual Train Acceptance Criteria.

Acceptance of the performance test for an individual NF unit shall be based on the demonstrated ability of that membrane unit to meet all of the following criteria consistently throughout the seven (7) day test.

- a. Permeate water production of a minimum of 2.00 mgd from each of Membrane units 1 through 7
- b. Meeting required permeate water quality parameter concentration limits or ranges specified in Table 01 77 55-1.
- c. Produce required permeate water production at a transmembrane pressure at or below the maximum transmembrane pressure as stated in Table 01 77 55-2.
- d. Meeting all testing condition functional operating parameters specified in this Section.

G. Failure to Meet Performance Testing Requirements

1. In the event that a Membrane train is unable to pass its Performance Test as a result of membrane performance or the performance of other parts supplied by the CONTRACTOR, the CONTRACTOR will be responsible for correcting these performance deficiencies at no cost to the OWNER. The CONTRACTOR shall be required to repair and/or replace elements and/or parts as necessary to obtain the specified performance. **The CONTRACTOR shall be responsible for all additional costs for labor, materials, equipment, overhead, and profit for unloading of defective membrane elements and re-loading of replacement membrane elements. Repairing or changing the salt rejection by contacting the membranes with chemical treatments will not be acceptable.** The OWNER may require that an entire 7-day performance test on any individual membrane unit be re-started (due to a failure to meet performance requirements) up to three times. After the third failed performance test, the OWNER has the right to deem the membrane unit being tested as not meeting the requirements of the Contract Documents. In the event that the membrane elements cannot meet the Performance Test requirements, the OWNER may, at its sole discretion, take the following actions:
 - a. Terminate the Performance Test and terminate this Contract in accordance with the General Conditions and exercise its options under the terms of the Performance Bond; or,
 - b. Allow the CONTRACTOR to repeat the Performance Test with revised operating conditions or new membrane elements or models at no additional cost to the OWNER; or,
 - c. Accept the original Performance Test results; or,

- d. Take other actions as negotiated with the CONTRACTOR and allowed under the Contract Documents.
- H. Cost for Performance Test Retesting
 - 1. In the event that the membrane units are unable to pass the Performance Test in the time period stipulated in the Contract as a result of membrane performance or the performance of other parts supplied by the CONTRACTOR, the CONTRACTOR will be responsible for all costs associated with the repair and/or replacement of the membranes and/or parts supplied by the CONTRACTOR including labor and supervision associated with removal and replacement of elements and/or interconnectors as required. In addition, the CONTRACTOR shall be subject to Liquidated Damages as stipulated in the Contract.

3.09 MEMBRANE SYSTEM TRAINING

- A. The MEM shall provide a Membrane Technician qualified to give training to the OWNER's staff for three days to instruct the OWNER's personnel on membrane theory and the proper operation, installation, sampling, cleaning, performance data normalization, and maintenance for the membrane system. The training shall be divided into two-hour modules. The training shall be given at three (3) different times each day. One of the training sessions will be in the morning, one in the afternoon, and the other during either the night or early morning shifts, at the discretion of the OWNER. The CONTRACTOR must provide sufficient trainers to accomplish three shifts of training.
- B. The MEM shall provide the services of a qualified Membrane Technician to be present on-site for a minimum of two (2) calendar days to assist with the first membrane unit cleaning procedure, which shall occur immediately after the completion of the second seven (7) day performance test. The cleaning procedure shall be demonstrated on one of the membrane units with old membrane elements, to be selected by the OWNER with CONTRACTOR's concurrence. The cleaning training must be provided in approximately two-hour modules during three (3) separate shifts. The shifts will consist of one in the morning, one in the afternoon and one during non-regular working hours. The cleaning procedure demonstration shall be recorded by the CONTRACTOR, and the digital file (in MP4 format) shall be delivered to the OWNER for future reference.
- C. Thirty days prior to loading membranes, the MEM shall supply the OWNER with three (3) copies of its standard computer software for calculating and generating reports of normalized operating data for each membrane train. The MEM shall include instruction for the OWNER's personnel in the proper operation and use of the membrane system normalization software.
- D. After all units are running, the MEM shall give each shift of operators a two-hour refresher course on membrane performance data normalization and reporting.

3.10 PROJECT CLOSEOUT

- A. The CONTRACTOR, prior to requesting final payment, shall obtain and submit the following items to the ENGINEER for transmittal to the OWNER:
 - 1. Written guarantees and warranty, where required.
 - 2. Releases from all parties who are entitled to claims against the subject project pursuant to the provisions of law.

END OF SECTION

SECTION 46 63 23

MEMBRANE SYSTEM EQUIPMENT AND INSTALLATION

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Furnish all designs, materials, labor, equipment and incidentals required for the replacement of the membrane pressure vessels and membrane elements in the OWNER's seven existing nanofiltration (NF) units including the procurement of pressure vessels, piping, and associated equipment and replacement membrane elements, removal of existing pressure vessels and membrane elements and installation of new pressure vessels and membrane elements. This work shall include shop drawing preparation, procurement, installation, and testing. The seven existing 2.0 mgd NF membrane treatment units are described for reference purposes in Section 01 77 55 and shown on the Drawings provided in the Technical Data.

While the CONTRACTOR is responsible for all equipment, materials, and work under this Contract, certain services must be provided by the specified Membrane Element Manufacturer (MEM). Wherever in these specifications equipment or services are specified to be provided by the "MEM" (rather than "CONTRACTOR"), they shall be provided directly by qualified employee(s) of the MEM.

- B. The membrane pressure vessels and accessories shall be provided by CONTRACTOR. The membrane elements will be a hybrid configuration of Hydranautics ESNA1-LF-LD and ESNA1-LF2-LD membranes. These membranes shall be furnished under this Contract by the MEM. The membrane loading and performance test (described later in this section) will be conducted immediately following completion of the pressure vessel replacement work. The MEM shall be responsible for the performance of the membranes and monitoring the results of the Performance Test of each unit. The CONTRACTOR shall be responsible for rectifying any defects associated with the modification of the membrane units and loading of the membrane elements.
- C. The CONTRACTOR-provided equipment and services under this contract shall generally consist of the following:
1. Preparation of detailed shop drawings and detailed design of membrane unit modifications.
 2. Procurement and delivery of 378 replacement membrane pressure vessels and all necessary accessories for the OWNER's seven (7) NF units.
 3. Disassembly, removal, and off-site disposal of the existing pressure vessels and membrane elements and reinstallation of the new pressure vessels in place of the existing pressure vessels.
 4. Manufacture and installation of new permeate connections.
 5. Flushing of the membrane units after the modifications have been completed and cleaning and disinfection of the vessels and membrane unit.
 6. Bacteriological sampling and clearance of each NF unit immediately prior to membrane loading.
 7. Loading of new membrane elements in the new pressure vessels.
 8. Start-up and testing of each membrane unit.

9. The above improvements shall be planned, scheduled, and executed so that no more than one NF unit will be out of service at any given time.
10. Correction of any defects associated with the membrane unit modification or membrane element installation.
11. Operation and maintenance training manuals for the equipment used in the membrane unit modifications.

1.02 DEFINITIONS

- A. MEM – The Membrane Element Manufacturer (MEM) is responsible for manufacturing and supplying the membrane elements. The MEM shall be Hydranautics, and shall be responsible for all services specified herein to be provided by the MEM.
- B. Selected available record drawings of the existing NF system are provided as Technical Data and are bound into this document for the CONTRACTOR's convenience.

1.03 RELATED WORK

- A. Section 01 78 23: Operation and Maintenance Data
- B. Section 01 77 55: Membrane System Performance Warranty
- C. Section 46 63 11: Membrane Elements and MEM's Services

1.04 DESCRIPTION OF THE EXISTING MEMBRANE SYSTEM

- A. The OWNER intends to have its seven existing 2.0 mgd NF membrane units modified as specified herein. This section summarizes the features of the existing membrane units and the projected performance after membrane and vessels replacement. The overall configuration for the membrane system is summarized in Section 01 77 55.
- B. The pretreatment system consists of cartridge filters and the dosing of antiscalant and sulfuric acid.
- C. Membrane system design criteria are specified in Paragraph 2.01 of this Section. Membrane unit configuration is specified in Section 01 77 55.
- D. Permeate water from the membrane units is directed to a degasification system for post-membrane treatment as shown and specified elsewhere.
- E. Concentrate water from the membrane units is directed to a deep injection well system.

1.05 SUBMITTALS

- A. All materials required to establish compliance with these specifications shall be submitted in accordance with the provisions of Section 01 33 00. It is important that the CONTRACTOR read and understand the provisions of Section 01 33 00, regarding drawing submittals.
- B. Submittals for the membrane system modifications shall include at least the following:

1. Descriptive literature, bulletins, and/or catalogs of the equipment.
2. A bill of materials for all equipment.
3. A list of spare parts recommended by the CONTRACTOR. The documentation of spare parts (submittal) shall be submitted with hardcopies and electronic Excel file format using the electronic Excel file provided by the City, a hardcopy of which is provided in Section 01 99 90.
4. Scaled engineering drawings of the portions of the existing membrane units that will interface with new replacement materials and equipment, giving physical dimensions of the pressure vessels and arrangements of interconnecting piping and accessories. Based on field measurements during development of these specifications, it appears that the specified replacement pressure vessels will be a "like kind" replacement of the existing pressure vessels, except that the existing permeate connections (J-bends) for the individual pressure vessels will need to be replaced. The CONTRACTOR shall make their own field-verification of all dimensions of the existing vessels and interfacing piping, structural supports, nozzles, accessories, etc. as necessary to ensure compatibility of the new pressure vessels with the existing system and to plan and sequence the pressure vessel replacement and membrane element replacement work in accordance with the contract requirements. Sketches of the proposed pressure vessels interfacing with the existing NF unit structure and piping are provided for the CONTRACTOR's reference at the end of this Section.
5. Resumes of the experienced membrane process and applications engineer employed by the CONTRACTOR who will in responsible charge of the detailed design and shop drawings and the CONTRACTOR's representative that will provide supervision of installation of the system modifications.
6. Corporate experience and resumes of key technical personnel utilized by the CONTRACTOR. Corporate experience information shall include a listing of all low pressure membrane projects completed by the CONTRACTOR within the past five calendar years.
7. Shop drawings and specifications for all purchased equipment.
8. A sample of the permeate connection proposed.

1.06 OPERATION AND MAINTENANCE MANUALS AND TRAINING

- A. Complete operation and maintenance (O&M) manuals for the equipment provided under this contract in accordance with the requirements of Section 01 78 23.

1.07 TOOLS AND SPARE PARTS

- A. All special tools required for normal operation and maintenance of the equipment shall be furnished by the equipment manufacturer.
- B. Spare parts, as specified in this section shall be furnished.

1.08 ENGINEERING AND WARRANTY SERVICES PROVIDED BY THE CONTRACTOR/MEM

- A. The CONTRACTOR shall prepare the portions of the O&M manual submittals pertaining to the membrane unit modifications.

- B. The MEM shall be responsible for the performance of the membrane elements and their ability to meet the stated water quality goals.

1.09 MEMBRANE SYSTEM WARRANTY

- A. The CONTRACTOR shall provide a one-year warranty on materials and workmanship for the equipment provided in accordance with the General Conditions and Supplementary Conditions.

PART 2 - EQUIPMENT AND MATERIALS

2.01 MEMBRANE SYSTEM GENERAL DESIGN CRITERIA

- A. The CONTRACTOR shall provide the services of an experienced membrane process and applications engineer for the design, installation, startup and testing of the membrane system modifications. The CONTRACTOR's membrane process and applications engineer shall have experience with similar size and type of membrane plants and shall be approved by the ENGINEER.
- B. The membrane system equipment covered by these Specifications is intended to incorporate standard membranes and equipment designs with proven abilities as manufactured by reputable firms having long experience in the manufacture of membrane system equipment.
- C. All pressure vessels shall be manufactured by the same manufacturer.
- D. All equipment shall be designed for continuous service at maximum operating pressures.
- E. Provisions shall be made for easy replacement of membrane elements and all other parts. Corresponding parts of multiple units shall be interchangeable.
- F. The membrane system is designed to treat raw water from Biscayne aquifer wells to potable quality. The membrane system design criteria are summarized in Section 01 77 55.

2.02 MEMBRANE SYSTEM CONFIGURATION

- A. The seven (7) 2.0 mgd membrane units are designed to operate at 87% recovery using three stages.
- B. Membrane Unit Configuration. The MEM shall base their bid on the membrane unit configuration as described in Section 01 77 55 and the modifications specified herein.

2.03 MEMBRANES

- A. The membrane elements shall be furnished by the MEM as specified in Section 46 63 11.

2.04 PRESSURE VESSELS

- A. Pressure vessels for the membrane units shall have a diameter and length so as to contain seven (7) standard eight-inch diameter by 40-inch standard length spiral wound elements. Pressure vessels shall be manufactured in the United States. Pressure vessels shall be side entry Model Pro 8-300-SP as manufactured by Bekaert Progressive Composites Inc, or Model 80A30 as manufactured by Code Line Division of Pentair Water Treatment.
- B. Vessels shall have a maximum working pressure of not less than 300 psi at a temperature of not less than 120 degrees F with a minimum operating temperature of not greater than 20 degrees F.
- C. Vessels shall be designed, constructed, inspected and stamped in accordance with the latest edition of the ASME Boiler and Pressure Vessel Code - Section X, Fiberglass - Reinforced Plastic Pressure Vessels.
- D. Vessels shall be complete with end closures, mounting hardware, and membrane element end connectors appropriate for the membrane element being supplied. Vessel shall be designed to allow the use of other makes of membranes by changing end connectors.
- E. Vessels shall be designed to allow membrane elements to be connected to the permeate port at both ends of the vessel so that permeate can be taken from either end of the pressure vessel.
- F. Pressure vessels shall include the following features:
 - 1. Each side-ported feed/concentrate port shall be constructed of 316L stainless steel and shall be designed to interface with a 1-1/2-inch flexible groove-joint coupling. Each side ported feed/concentrate port shall incorporate a flush-face elastomeric seal that seals directly to the inside diameter of the vessel shell so that edge laminate surfaces are not exposed and dead spaces are eliminated. The center-to-center distance between side ports shall be 285 inches.
 - 2. Permeate ports on the permeate manifold end shall be 1-1/4 inch diameter groove-joint with pressure rating of 125 psig. Permeate ports on the other end shall be 1-inch FPT. The CONTRACTOR shall provide all necessary 316 stainless steel fittings, and a 3/8-inch 316 stainless steel ball valve, on each vessel to allow probing of the permeate tube within the vessel.
 - 3. The head seal gland shall be designed to eliminate dead space and to allow the seal surface to be exposed for flushing of the seal. Each permeate port shall be designed with an anti-rotation mechanism so that piping may be easily tightened.
 - 4. The primary means for head retention shall be a 302 stainless steel, three turn, single piece retaining ring. Each head shall contain an integral secondary interlock that requires a specific sequence of events to remove the end closure and shall not require the use of separate components that may become separated from the vessel.

- G. Materials of construction shall be approved for use in pressure vessel construction by the ASME Boiler and Pressure Vessel Code. Materials shall be code certified and lot traceable.
- H. The vessel shall be fabricated from filament wound fiberglass using continuous glass roving impregnated with an elevated cure epoxy resin. Materials shall be lot traceable to vessel serial numbers.
- I. All vessels shall be painted in the factory. Prior to painting, each vessel shall be sanded to promote adhesion of the coating to the shell. Each end bell and body wall shall be free from grinding or sanding marks. The length of the body wall between the end bells shall be straight and smooth, and without any lumpiness that may indicate filament-winding inconsistency. The paint system shall be a two-part poly-urethane enamel, Devco Devthane 379UVA, or approved equal. The paint system shall be applied in a two-step process. First, a light tack coat shall be applied over the entire vessel followed by a final topcoat. The final paint thickness shall be 5 mils. Paint coatings shall be completely opaque to light.
- J. All vessels shall be made of non-corrosive materials. Metal parts in contact with the process stream shall be stainless steel type 316 or equal as approved by the ENGINEER.
- K. The following spare parts shall be provided:
 1. 6 complete head assemblies – 3 of each permeate port type with finger pull retaining rings.
 2. 20 F/C seals and retaining rings.
 3. 20 seals for head assemblies – permeate port, permeate port adapter, head seal.
 4. 20 perm permeate port retaining rings.
 5. 4 of each permeate ports.
 6. 2 T-pulls or head removal tools.
 7. 4 membrane adapters and 20 PWT seals.
 8. 4 thrust cones.
 9. 28 1.5-inch 316 stainless steel groove-joint couplings with gaskets.
 10. 14 1.25-inch 316 stainless steel groove-joint couplings with gaskets.
 11. 14 Schedule 10 316 stainless steel 1.25-inch diameter groove-joint permeate J-bends.

2.05 MEMBRANE UNIT SUPPORT STRUCTURE

- A. The pressure vessel assemblies shall be adequately supported on the support structure by plastic, contoured saddles or cradles and stainless steel retaining clamps. Three saddles and two support straps are to be provided with each vessel.
- B. In the event that the holes for the vessel straps need to be redrilled or enlarged or if the paint system on the frames is damaged, the frames shall be touch up painted to protect any exposed metal. The touch up paint will be applied with a three part paint system which includes a stripe coat of Series 90-97 by Tnemec, a 1st coat of Series N69 by Tnemec, and a topcoat of Series 73 by Tnemec.

- C. All mounting hardware and bolting for pressure vessels, manifolds, and other membrane unit support structure components shall be 316 stainless steel.

2.06 PROCESS PIPING

- A. All existing permeate J-bends shall be replaced in kind with 1.25-inch diameter Schedule 10 316 stainless steel groove-joint bends. All pipe fabrications shall be pickled and passivated by immersion in acid after fabrication. Alternate methods will not be accepted. All piping welds shall be full penetration welds done by AWS certified welders.
- B. The piping shall be at least Schedule 10, Type 316L (ASTM A-312) stainless steel seamless pipe.
- C. All existing groove-joint couplings and gaskets shall be replaced with the new pressure vessels (three per pressure vessel). Couplings shall be all 316 stainless steel by Victaulic, Piedmont, or equal.

PART 3 - EXECUTION

3.01 COORDINATION OF THE CONTRACTOR WITH THE MEM

- A. The CONTRACTOR and CONTRACTOR shall notify the OWNER, MEM and ENGINEER by certified mail that the CONTRACTOR will be ready to commence loading the new membranes into unit number one 14 days prior to the date that the CONTRACTOR will have completed the installation of the new vessels and all associated piping modifications and will have cleaned and disinfected the vessels so that they will be ready for membrane element loading. The ENGINEER will then coordinate with the OWNER and the CONTRACTOR a date for the Membrane Element Pre-installation meeting.

3.02 CONTRACTOR'S RESPONSIBILITY PERTAINING TO MEMBRANE ELEMENTS

- A. The CONTRACTOR and CONTRACTOR shall be responsible for any damage to the membrane elements associated with the handling of membrane elements during the membrane loading process. If loading and unloading of any membrane elements is necessary due to problems associated with membrane loading, any damage to the membrane elements associated with handling of the membrane elements during these operations will be the responsibility of the CONTRACTOR.
- B. If there is damage to membrane elements as a result of the CONTRACTOR's and CONTRACTOR's handling of the membrane elements as described above, the damaged membranes shall be replaced with new identical membrane elements at the expense of the CONTRACTOR.

3.05 MEMBRANE ELEMENT PRE-INSTALLATION MEETING

- A. Representatives of the CONTRACTOR and MEM shall attend a membrane element pre-installation meeting with the OWNER and ENGINEER to review the procedure for installation of the membrane elements into the membrane units as describe above.

3.06 REMOVAL AND INSTALLATION OF MEMBRANE ELEMENTS

- A. The CONTRACTOR shall provide supervision, labor, tools, construction equipment, incidental material, and necessary services required to remove the existing pressure vessels, install new replacement pressure vessels, and make the NF units ready for installation of the new membrane elements. The CONTRACTOR and MEM shall provide supervision, labor, tools, equipment, and materials to install membrane elements in the new pressure vessels and complete start-up and testing of each NF unit.
- B. The MEM shall provide a representative on site during the membrane installation process to certify that the membrane elements have been installed correctly and that the installation work conforms to the MEM's recommended procedures, instructions, and approved shop drawings. The CONTRACTOR shall provide on-site supervision and labor for the installation of all the membrane elements into the membrane units.
- C. Membranes shall not be installed until a system disinfection flush of the membrane units, pressure vessels, and associated piping has been completed.
- D. Membranes shall not be loaded until it has been demonstrated that membrane unit has been sufficiently cleaned and flushed. The CONTRACTOR shall allow sufficient time for these activities and shall make provisions for disposal of the flush water to acceptable areas, as determined by the ENGINEER and OWNER, during the flushing activities. Temporary connections to the sewer or the deep well shall be provided if necessary.
- E. If the MEM requires that the membranes be loaded in a specific order, the MEM shall provide this information to the CONTRACTOR and shall pack and organize the elements in a manner that is consistent with the loading schedule. The MEM's on-site representative shall assist the CONTRACTOR with coordinating the loading schedule.
- F. In order to prevent bacteriological contamination of the membranes, the CONTRACTOR and MEM shall ensure that unpackaged membrane elements are not placed in direct contact with the ground, floor, standing water, or dirt, and will instruct installers to maintain sanitary and clean conditions.
- G. Prior to loading membranes, the pressure vessels shall be swabbed out and disinfected with clean rags soaked in chlorine solution. All spillage shall be cleaned up immediately to prevent damage and corrosion of adjacent equipment.
- H. All piping, end caps, and membrane interconnectors shall be disinfected by soaking in a hypochlorite solution. Care shall be taken not to contact the membranes with hypochlorite solution because it will damage the membranes.
- I. It is the intention of this Contract to load membranes into one unit at a time and to complete performance testing of the membrane units as described in Paragraph 3.09.
- J. The CONTRACTOR shall use only equipment that may be supported by the existing floor grating system (rated load 330 pounds per square foot) for the work in the membrane process bay, and shall take care to avoid damage to the existing floor grating, flooring, and other surfaces within the building.

- K. The existing pressure vessels and membrane elements will become the property of CONTRACTOR and shall be removed from the site within 15 days of their removal from the membrane units.

3.07 MEMBRANE SYSTEM EQUIPMENT INSTALLATION

- A. The CONTRACTOR shall provide the services of an experienced membrane unit Installation Supervisor on-site to supervise the installation of membrane pressure vessels and associated equipment. The CONTRACTOR shall submit the qualifications of the Installation Supervisor to the ENGINEER for approval.
- B. The duties of the Installation Supervisor shall include the following for each item of membrane system equipment furnished. These are subject to all limitations and requirements directed by the ENGINEER or specified elsewhere.
 - 1. Give all necessary instructions for proper unloading and installation and testing of the membrane pressure vessel, piping modifications and associated equipment.
 - 2. Be present at the work at all times necessary for proper supervision.
 - 3. Coordinate with the MEM in the supervision of membrane element loading.

3.08 STARTUP AND TESTING

- A. Prior to initiation of the specified startup and testing activities, a coordination meeting shall be held by the CONTRACTOR with the OWNER, OWNER'S operators and the ENGINEER and the MEM. The OWNER and ENGINEER shall be notified of the meeting at least ten (10) calendar days in advance. The CONTRACTOR shall coordinate with the MEM and shall submit a detailed startup and testing plan to be submitted at least 30 days prior to the Startup Coordination Meeting. This plan shall be submitted in writing to the OWNER and ENGINEER and shall clearly indicate anticipated flows, duration of flows, nature of the content of the produced streams, the piping and handling arrangements for the produced stream, the intermediate storage structure for the produced streams, and the ultimate disposal point for each produced stream. The Test Plan shall outline the sequence for preservative flushing, bacteriological clearance, startup, and Performance Testing of all units. The test plan shall include the test procedures, sequences and schedule, operational checks, any required changes to alarm setpoints, checklists, and data log sheets. OWNER and ENGINEER shall review and approve the plan prior to initiation of the removal of the existing membrane elements.
- B. Disinfection and Flushing: Prior to loading membranes, the pressure vessels shall be swabbed out and disinfected with clean rags soaked in chlorine solution. The CONTRACTOR shall provide temporary piping to flush each unit as required. Flushing shall be accomplished by flowing feed water through the pumps and feed piping through empty pressure vessels, exiting through the concentrate and permeate lines. Flushing shall continue until all air pockets have been removed from piping and pressure vessels and no chlorine can be detected. The CONTRACTOR shall provide temporary piping from each NF unit combined permeate piping to allow the membrane preservative solution to be flushed to waste upon startup of the unit immediately following loading of the new membranes. Permeate shall be flushed in accordance with the MEM's recommended guidelines. Disposal of the flushing water shall be to the sewer, the deepwell or to another disposal point agreed to by the OWNER.

- C. Functional Testing. Prior to loading membranes, the CONTRACTOR shall conduct a functional test of each unit. The unit shall be operated in both the normal operating mode and the cleaning configurations for both sections of the first stage and the second stage. This testing is to confirm that the valves and connections are functioning properly and that there are no obstructions or restrictions in flow that would adversely impact the operation of the unit or performance testing.
- D. It is the intent of the OWNER to utilize the permeate water during the 7-day performance test periods to satisfy distribution system demand.
- E. Leak Testing. All new piping and equipment shall be leak tested by the CONTRACTOR and witnessed by the ENGINEER. After installation of the membranes, the membrane units shall be started and the pressure to the membrane units shall be increased in increments to allow identification and repair of leaks prior to reaching normal system operating pressure. All trapped air shall be removed from piping and pressure vessels prior to reaching normal operating pressure.

3.09 MEMBRANE PERFORMANCE TESTING

- A. Performance testing of the membrane system shall be scheduled by the OWNER and MEM. Substantial Completion for the membrane system will be contingent upon successful completion of the performance testing of all membrane units. Substantial Completion for the CONTRACTOR will be contingent upon successful completion of the performance testing of all membrane units in terms of the functional operation of the equipment and repairs provided by the CONTRACTOR and the correction of any membrane installation problems. The CONTRACTOR will be allowed to submit an application for payment for Partial Utilization of each membrane unit upon successful completion of the first three days of operation of the membrane unit during the Performance Test for that unit.
- B. Services during the performance test. The CONTRACTOR shall provide the following services with respect to the Performance Test of each unit:
 1. Supervision, labor, tools, construction equipment, incidental material, and necessary services required for the initial installation of the membrane elements.
 2. Have a representative present for the startup and initial three days of operation of each membrane unit.
 3. Repair all leaks and correct any defects with respect to work performed by the CONTRACTOR.
 4. Provide supervision, labor, tools, construction equipment, incidental material, and necessary services for unloading and reloading membrane elements in any vessels that appear to have leaks at "O"-rings or other problems associated with the installation of the membranes in the pressure vessels.
 5. During the performance test, the CONTRACTOR should be prepared to perform the work outlined above within 24 hrs of receiving notice from the ENGINEER.
- C. To the maximum extent possible, it is intended that all seven membrane units shall be tested continuously for seven (7) consecutive days, 24-hours per day. Depending on the

City's water supply needs, it may be necessary to shutdown and restart membrane units as required by system demands. The sequence of testing shall be as follows: The 7-day performance test for the first unit shall be commenced upon approval of the testing plan by ENGINEER. Testing of subsequent units shall not commence until the 7-day test of the preceding unit has been satisfactorily completed.

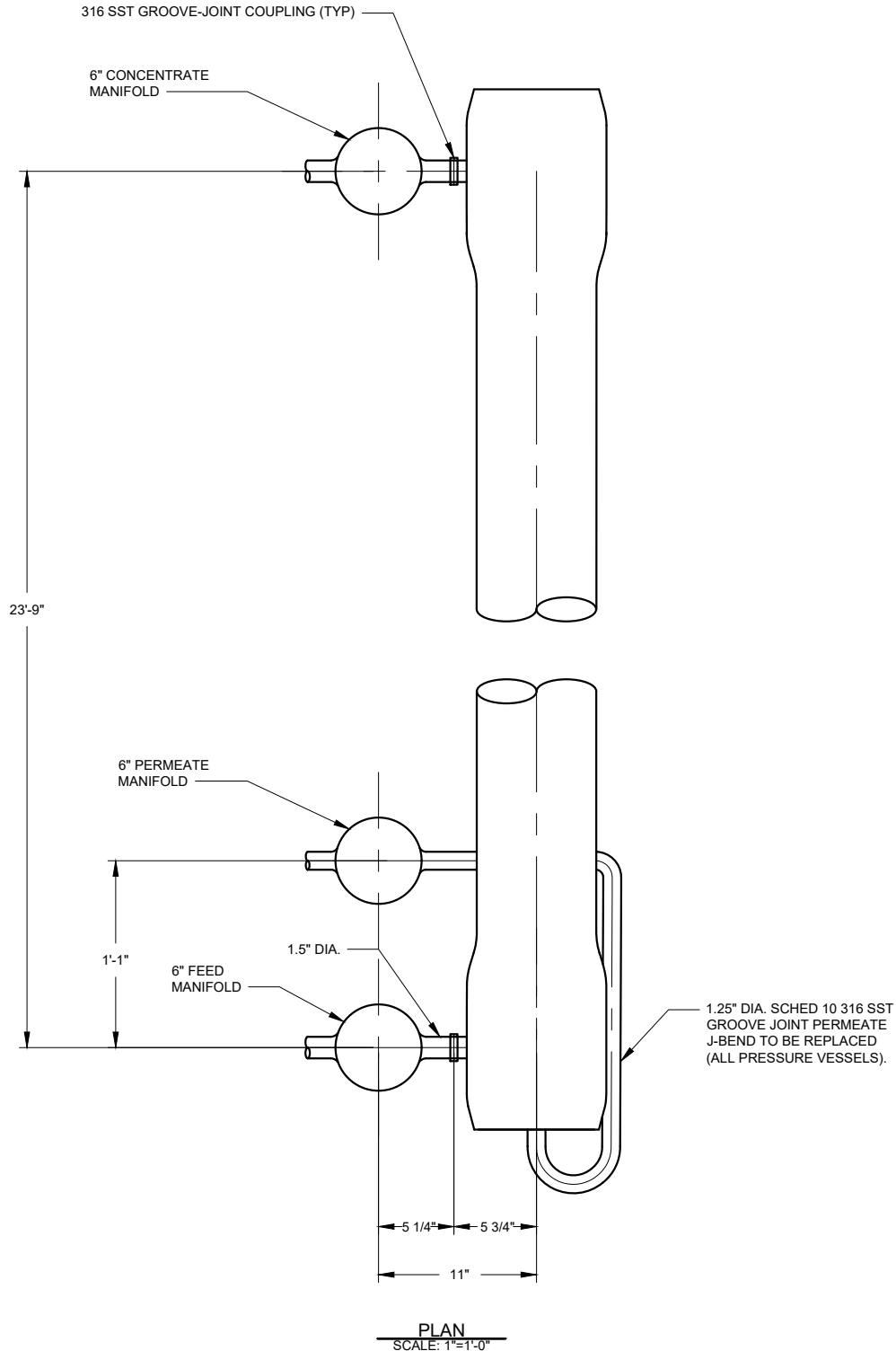
3.10 MEMBRANE SYSTEM TRAINING

- A. The CONTRACTOR shall provide the services of a qualified technical representative for two four-hour training sessions to instruct the OWNER's personnel on proper operation and maintenance of the modified membrane system (one session for operation and one session for maintenance). The CONTRACTOR shall also instruct the OWNER's personnel on the maintenance of the pressure vessels and equipment provided under this contract. Training and manufacturer's services shall also include a total of three days of the pressure vessel manufacturer's field service manager's time for final inspection of installation, and Owner training addressing normal installation, assembly, disassembly, and maintenance procedures, troubleshooting, leak testing, etc. for the pressure vessels. Training sessions shall be videotaped by the CONTRACTOR, and the tape delivered to the Owner for future reference.

3.11 PROJECT CLOSEOUT

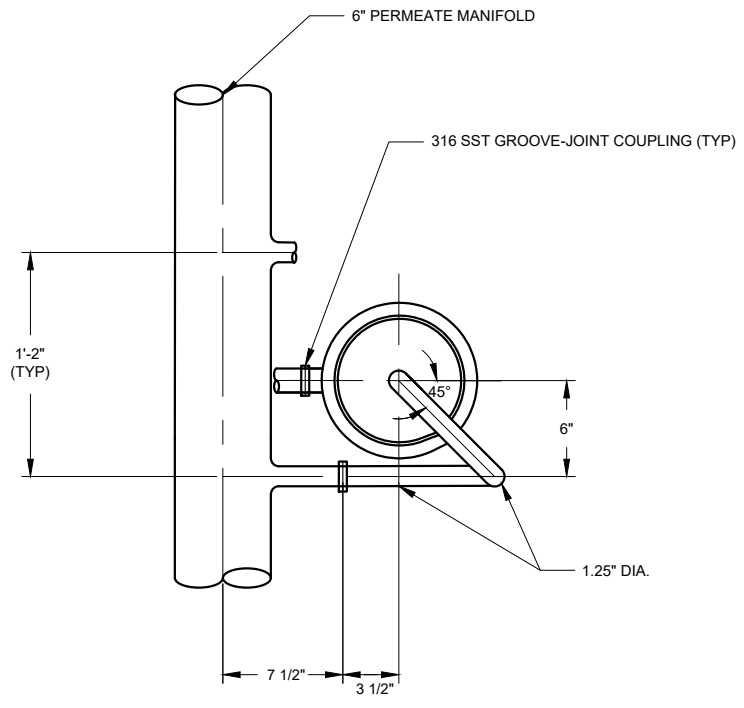
- A. The CONTRACTOR, prior to requesting final payment, shall obtain and submit the following items to the ENGINEER for transmittal to the OWNER:
 - 1. Written materials and workmanship warranty, where required.
 - 2. Releases from all parties who are entitled to claims against the subject project pursuant to the provisions of law.

NOTE: DIMENSIONS ARE PROVIDED FOR PRICING PURPOSES ONLY. CONTRACTOR SHALL FIELD-VERIFY ALL DIMENSIONS AND THE CONFIGURATION OF THE EXISTING PIPING AND NF UNIT STRUCTURE AS NECESSARY TO SELECT PRESSURE VESSELS AND FABRICATE REPLACEMENT PERMEATE J-BENDS TO BE COMPATIBLE WITH THE EXISTING NF UNIT CONFIGURATION. CONTRACTOR SHALL SUBMIT DIMENSIONED LAYOUT DRAWINGS BASED ON FIELD MEASUREMENTS TO ENGINEER FOR APPROVAL PRIOR TO RELEASING PRESSURE VESSELS AND J-BENDS.

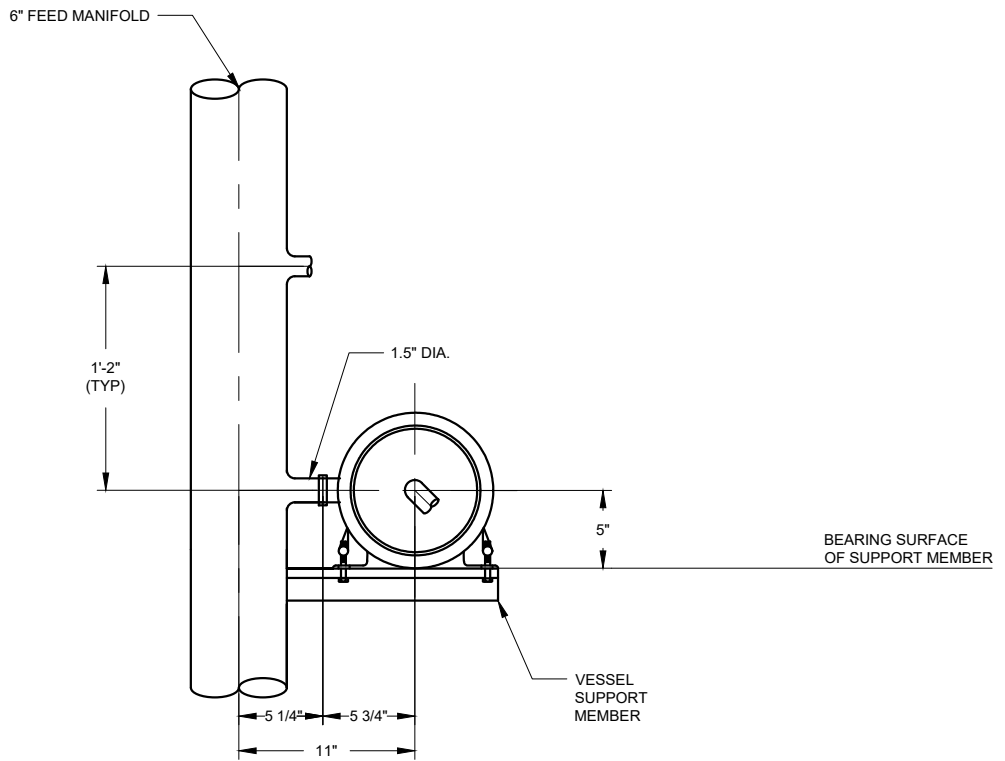


File: \\MCC\BIC Public\Shared\Project Files\Brown and Caldwell\Hollywood\18.06 Hollywood Membrane Element Replacement\Design\Drawings\CAD\Figure 1.dwg

NOTE: DIMENSIONS ARE PROVIDED FOR PRICING PURPOSES ONLY. CONTRACTOR SHALL FIELD-VERIFY ALL DIMENSIONS AND THE CONFIGURATION OF THE EXISTING PIPING AND NF UNIT STRUCTURE AS NECESSARY TO SELECT PRESSURE VESSELS AND FABRICATE REPLACEMENT PERMEATE J-BENDS TO BE COMPATIBLE WITH THE EXISTING NF UNIT CONFIGURATION. CONTRACTOR SHALL SUBMIT DIMENSIONED LAYOUT DRAWINGS BASED ON FIELD MEASUREMENTS TO ENGINEER FOR APPROVAL PRIOR TO RELEASING PRESSURE VESSELS AND J-BENDS.



END VIEW WITH PERMEATE MANIFOLD
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END VIEW WITH FEED MANIFOLD
SCALE: 1"=1'-0"

File: \\MCC\BIC Public\Shared\Project Files\Brown and Caldwell\Hollywood\18-06 Hollywood Membrane Element Replacement\Design\Drawings\CAD\Figure 2.dwg

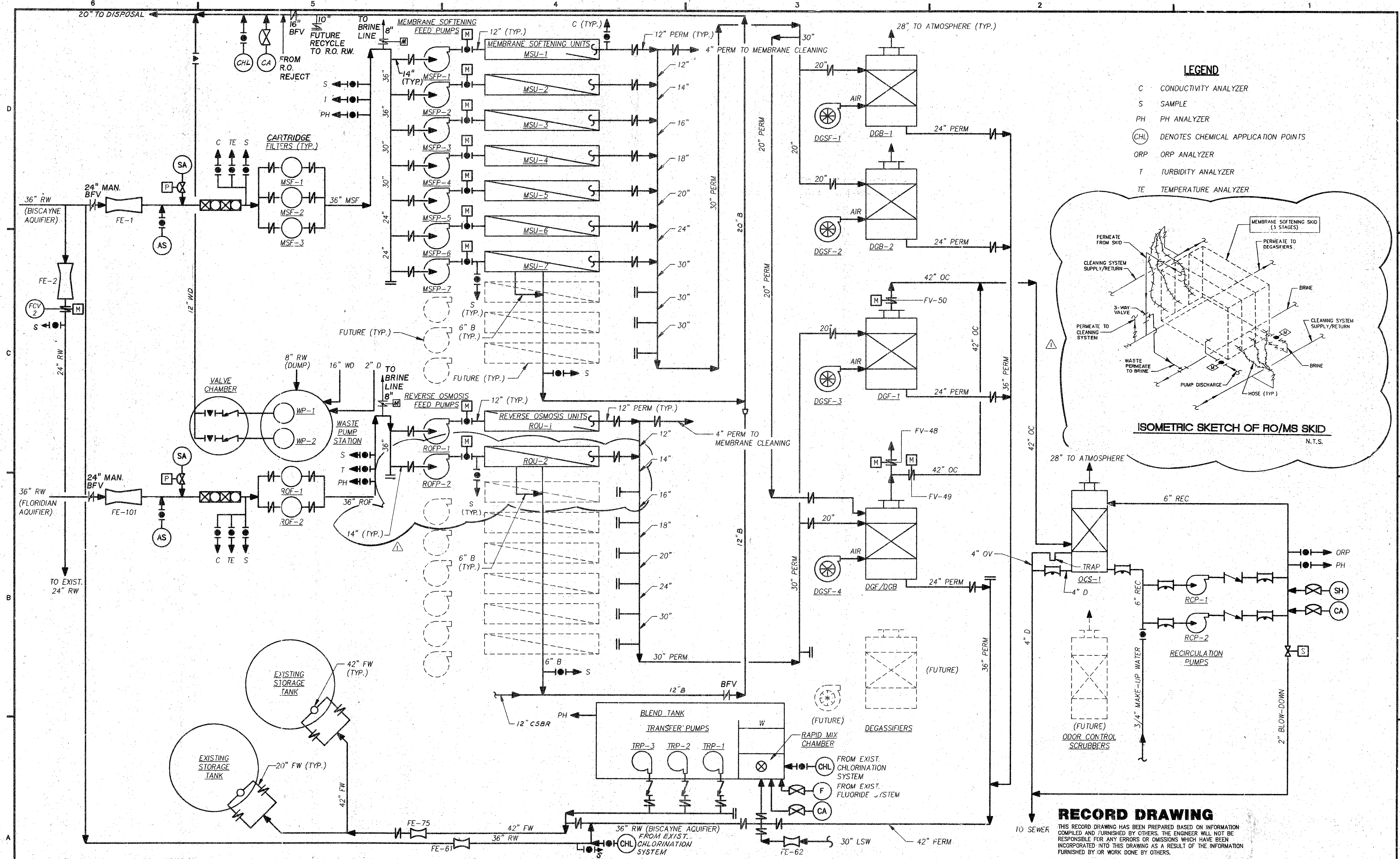
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TECHNICAL DATA

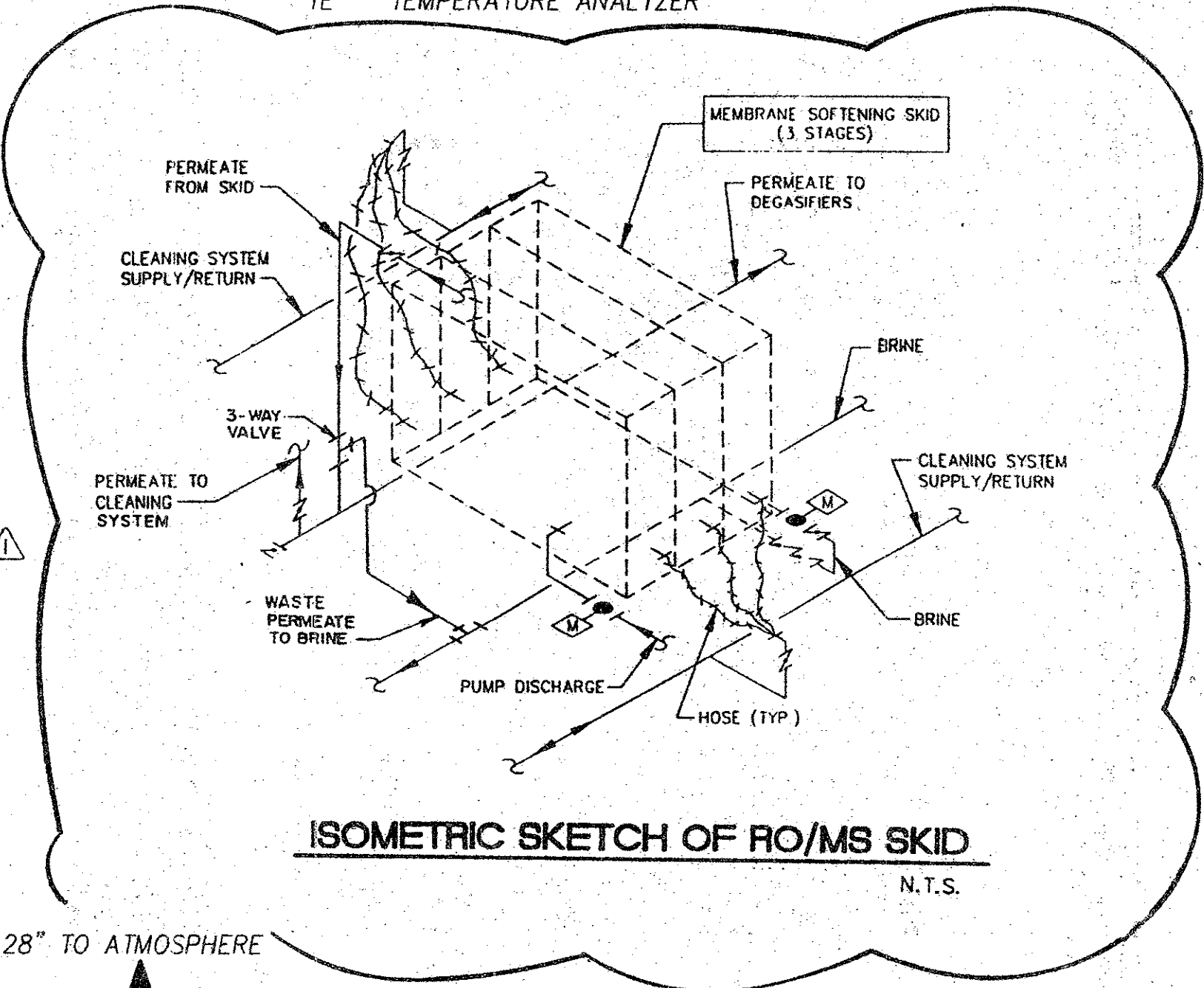
The documents following this page are bound into this document for the BIDDER's/CONTRACTOR's convenience. These documents constitute technical data, and are not Contract Documents.

Selected record drawings from the City of Hollywood Water Treatment Plant Upgrade Phase I, Metcalf & Eddy, December 8, 1995.

Photographs of typical existing NF unit.



- LEGEND**
- C CONDUCTIVITY ANALYZER
 - S SAMPLE
 - PH PH ANALYZER
 - CHL DENOTES CHEMICAL APPLICATION POINTS
 - ORP ORP ANALYZER
 - T TURBIDITY ANALYZER
 - TE TEMPERATURE ANALYZER



RECORD DRAWING

THIS RECORD DRAWING HAS BEEN PREPARED BASED ON INFORMATION COMPILED AND FURNISHED BY OTHERS. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THIS DRAWING AS A RESULT OF THE INFORMATION FURNISHED BY OR WORK DONE BY OTHERS.

12/08/95	KJH	RECORD DRAWING
10-20-93	GAP	CONFORMED DRAWINGS
5131M9		REVISIONS

DRAWN BY <i>S. DTE</i>
DEPT. CHECK <i>F. BAILEY</i>
PROJ. CHECK

M&E METCALF & EDDY

REG. PROF. ENGR. _____ DATE _____

REG. PROF. ENGR. _____ DATE _____

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

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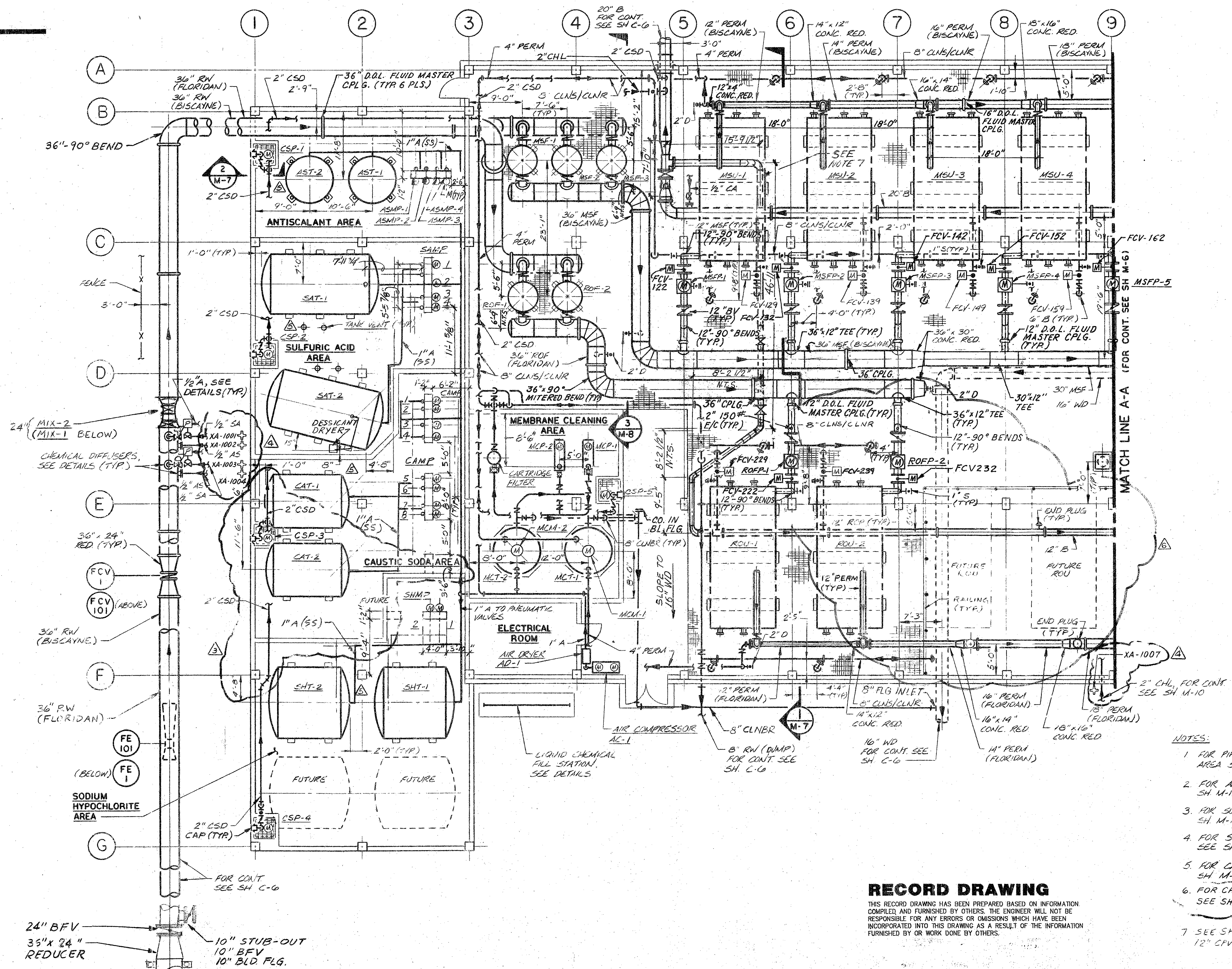
CITY OF HOLLYWOOD, FLORIDA
WATER TREATMENT PLANT UPGRADE
PHASE I

PROCESS FLOW DIAGRAM

MECHANICAL

005131

M-4



- NOTES:
1. FOR PIPING SCHEMATIC IN MEMBRANE CLEANING AREA SEE SH. M-8.
 2. FOR ANTISCALANT SYSTEM SCHEMATIC SEE SH. M-13.
 3. FOR SULFURIC ACID SYSTEM SCHEMATIC SEE SH. M-14.
 4. FOR SODIUM HYPOCHLORITE SYSTEM SCHEMATIC SEE SH. M-15.
 5. FOR CAUSTIC SODA SYSTEM SCHEMATIC SEE SH. M-16.
 6. FOR CHLORINATION SYSTEM SCHEMATIC SEE SH. M-17.
 7. SEE SHEET M-7, SECT. ELEV. A-13 FOR 12" CPVC CONCENTRATE.

RECORD DRAWING

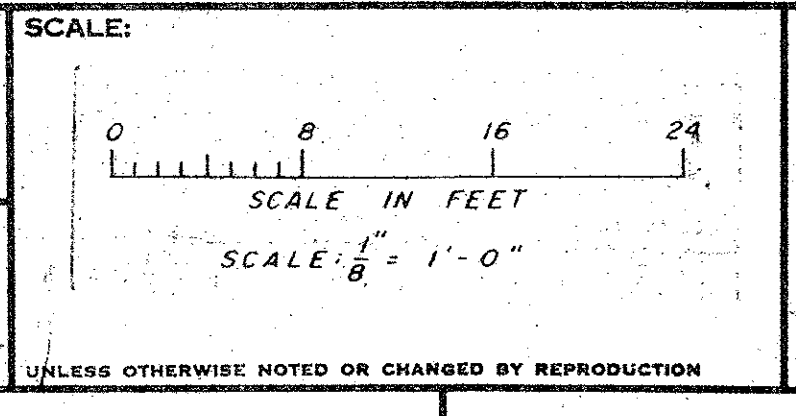
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NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTION
9/12/95	KJH			RECORD DRAWING
10-20-93	GAP			CONFORMED DRAWINGS
6/18/93	JEM	FuB		INCORPORATE REVIEW COMMENTS
6/16/93	SRG	FuB		CHEMICAL TANKS MODIFICATIONS
4/14/93	DFS	FuB		CHEMICAL AREA MODIFICATIONS

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DEPT. CHECK F BAILEY
PROJ. CHECK

M&E METCALF & EDDY

REG. PROF. ENGR. _____ DATE _____

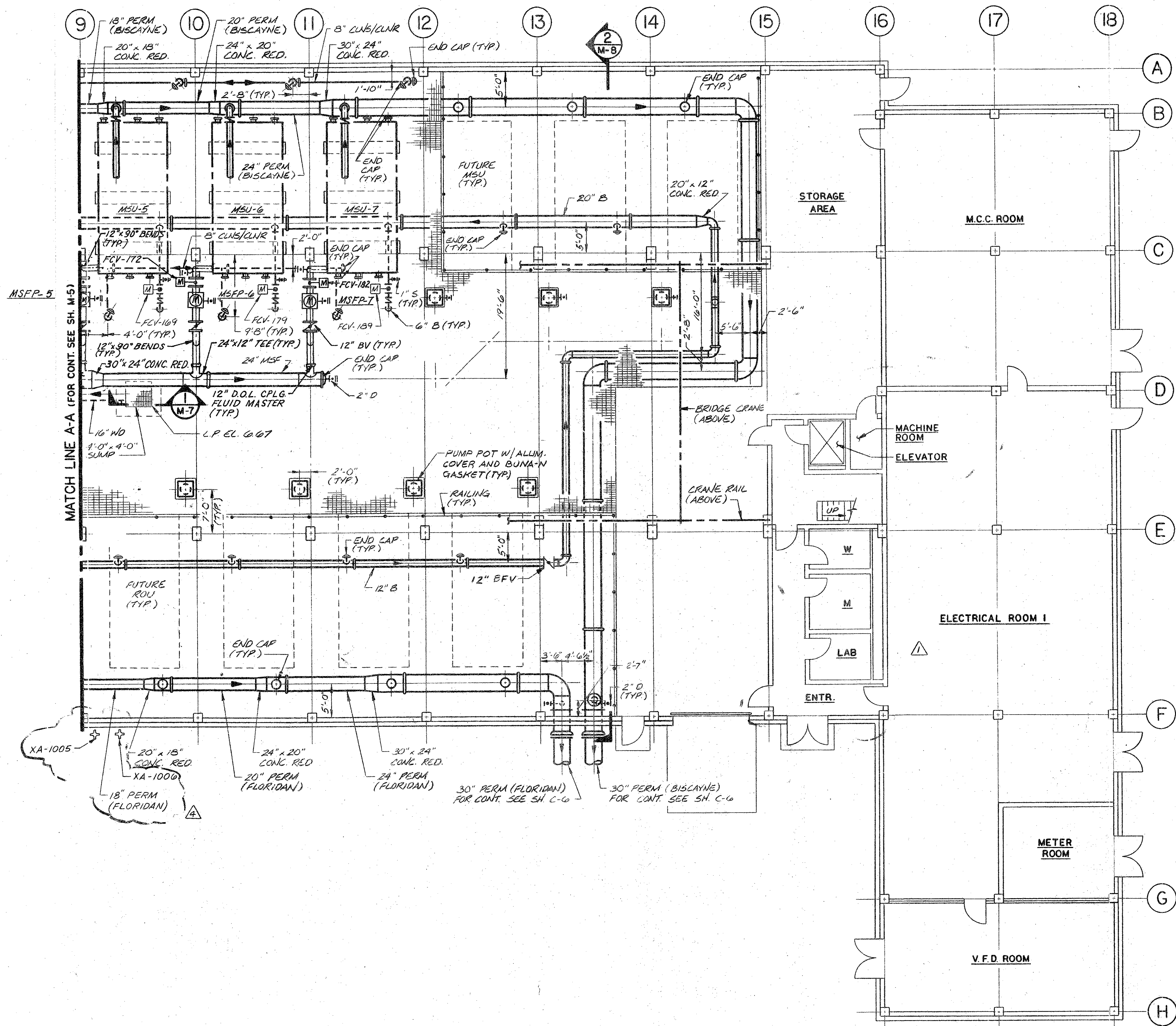


CITY OF HOLLYWOOD, FLORIDA
WATER TREATMENT PLANT UPGRADE
PHASE I

OPERATIONS BUILDING PLAN I

MECHANICAL

JOB	005131
FILE NO.	
SHEET	M-5

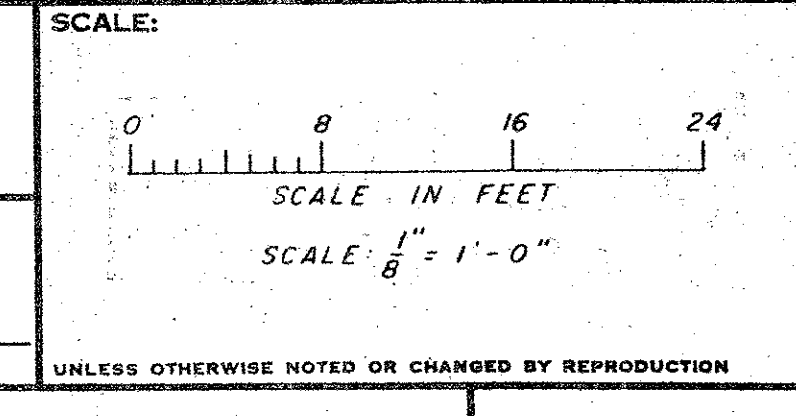


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NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTION
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	6/18/93	J.E.M.	F.W.B.	INCORPORATE REVIEW COMMENTS
	3/2/93	S.A.C.	F.W.B.	INCREASED HANDICAPPED ACCESS

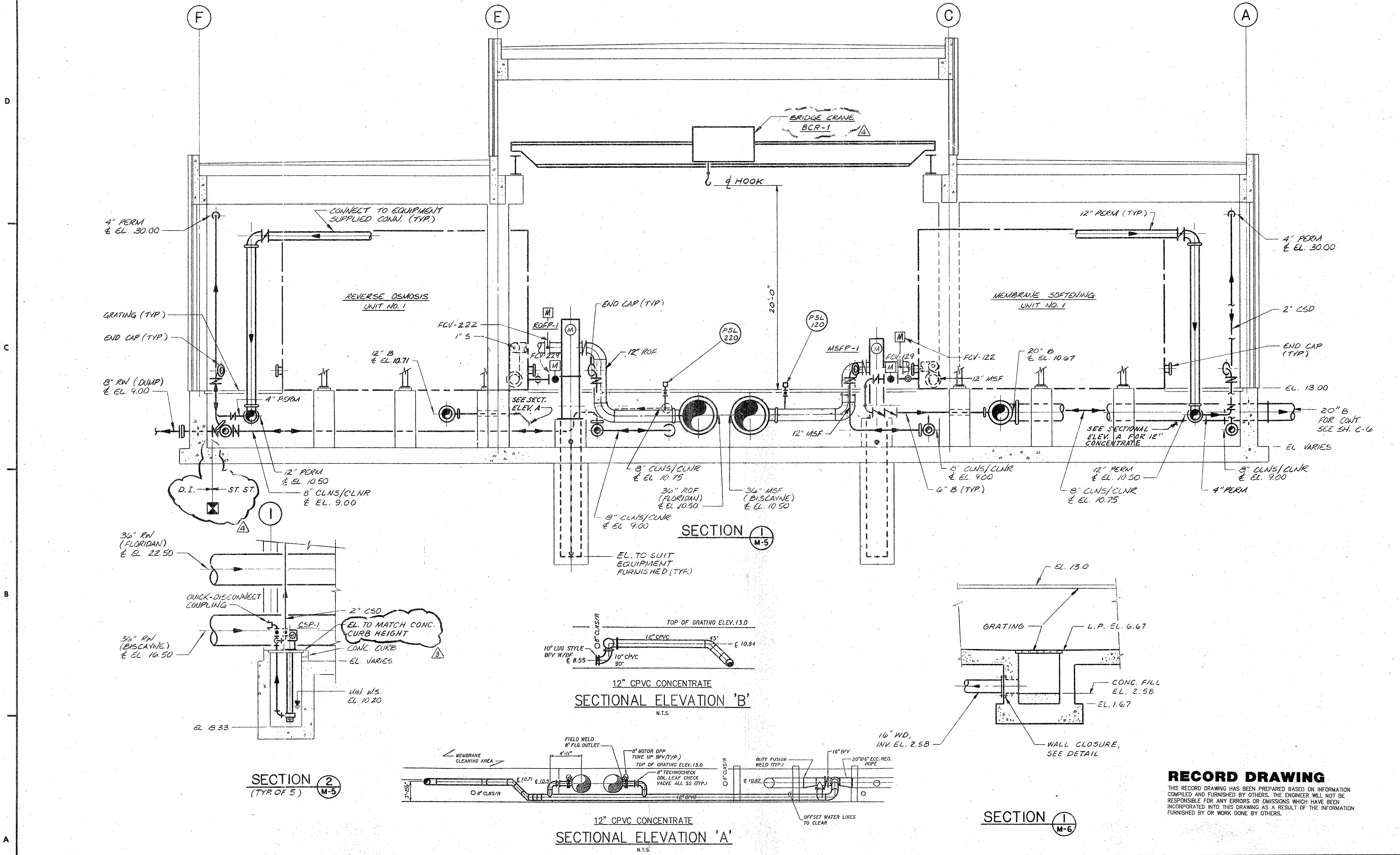
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M&E METCALF & EDDY
 REG. PROF. ENGR. _____ DATE _____



CITY OF HOLLYWOOD, FLORIDA
 WATER TREATMENT PLANT UPGRADE
 PHASE I
OPERATIONS BUILDING PLAN II
 MECHANICAL

JOB NO. 005131
FILE NO. _____
SHEET M-6



RECORD DRAWING
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NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS	DESCRIPTION
	12/08/95	K.J.H.		RECORD DRAWING	
	6/18/93	JEM	F.W.B.	INCORPORATE REVIEW COMMENTS	
	4/14/93	SAC	F.W.B.	CHEMICAL AREA MODIFICATIONS	

DRAWN BY
S. COOK

DEPT. CHECK
F. LALEY

PROJ. CHECK

M&E METCALF & EDDY

REG. PROF. ENGR.

DATE

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CITY OF HOLLYWOOD, FLORIDA
 WATER TREATMENT PLANT UPGRADE
 PHASE I

OPERATIONS BUILDING SECTIONS I

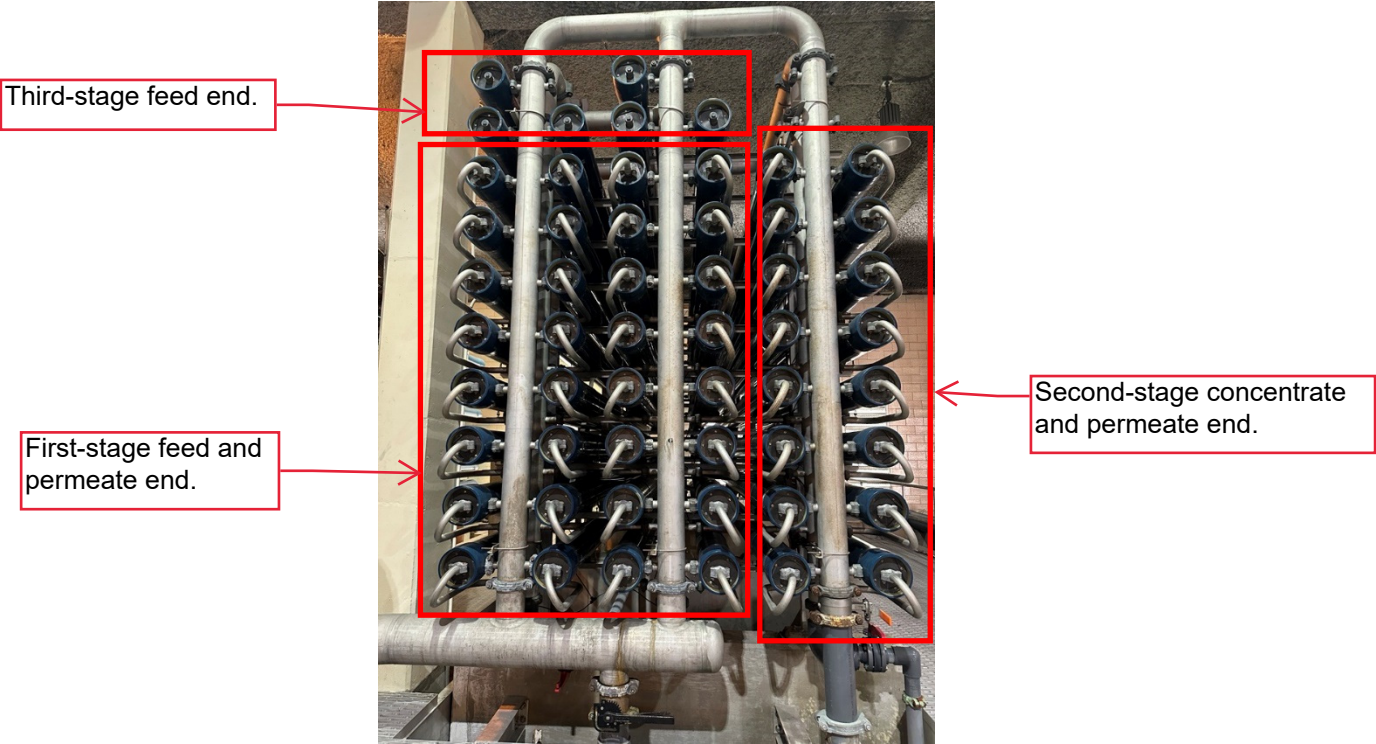
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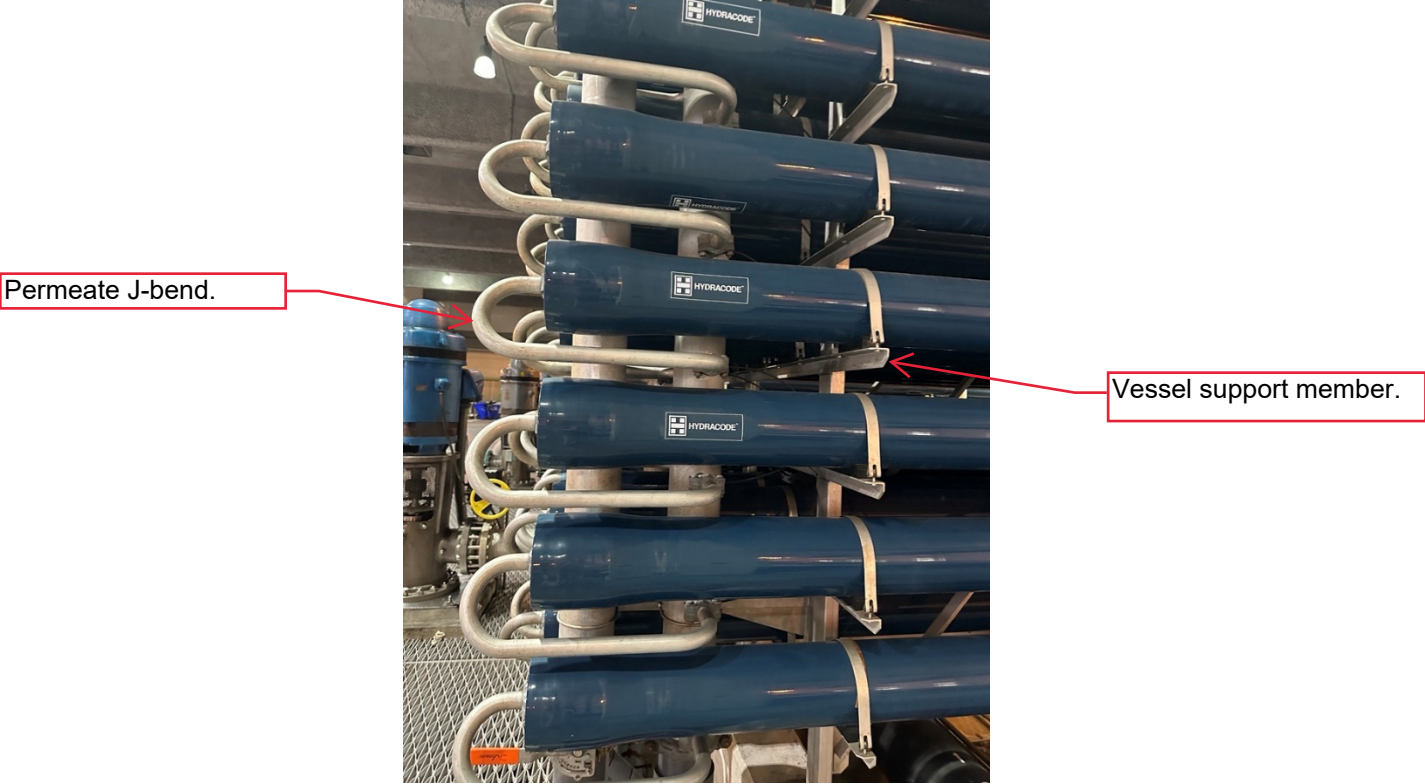
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SHEET: M-7

Photographs of Typical Existing NF Unit



Front End View



Side View Showing Permeate J-Bends and Vessel Support Member



Back End View

SECTION 01 77 55
MEMBRANE SYSTEM PERFORMANCE WARRANTY

PART 1 - GENERAL

1.01 THE REQUIREMENT

- A. Membrane System Performance.
- B. Technical Services.
- C. Membrane Element Replacement.
- D. Workmanship and Materials.
- E. Administration of Warranty.

1.02 RELATED WORK

- A. Section 46 63 11: Membrane Elements and MEM's Services.

1.03 SUBMITTAL REQUIREMENTS

- A. Membrane process projections from the Membrane Element Manufacturer (MEM) for membrane ages 0 through 3 years shall be submitted upon execution of the Contract.
- B. This warranty shall be submitted as part of the Contract.

1.04 DEFINITIONS

- A. ARRAY. The arrangement of pressure vessels and membrane elements in a membrane unit or train, described by the number of vessels in the first stage and the number of vessels in the second stage (and third stage if applicable) (e.g. 4:2 means 4 vessels in the first stage and 2 vessels in the second stage) and the number of membrane elements in each pressure vessel.
- B. CAPACITY. The total flow of permeate produced by any one of the membrane units in a 24-hour period at the standard conditions specified in this Warranty. The capacity shall be normalized to the standard conditions according to the MEM's standard normalization software available as of the date of Award or similar normalization software submitted by the MEM and approved by the OWNER and ENGINEER. Calculation procedures used in this software should be consistent with procedures used in the latest revision of ASTM D4516 "Standard Practice for Standardizing Reverse Osmosis Performance Data" and industry standards.

Addendum no.2 : Additions; ~~Deletions~~

REPLACEMENT OF NANOFILTRATION
PROCESS PRESSURE VESSELS AND
MEMBRANE ELEMENTS

MEMBRANE SYSTEM PERFORMANCE WARRANTY

- C. FEED PRESSURE. The pressure measured downstream of the feed inlet valve.
- D. FEED TEMPERATURE. Temperature of feed water measured at the inlet manifold to the membranes. This temperature is to be used for normalization of membrane performance.
- E. FLUX. The average rate of permeate, in gallons permeated across one square foot of the installed membrane surface in one day, with units of GFD (gallons per square foot per day). Average flux for a membrane train or unit shall be calculated as the total unit permeate flow divided by the total membrane area installed in all stages of the unit. Average flux for a single stage shall be calculated as the total stage permeate flow divided by the total membrane area installed in that stage.
- F. FOULING ALLOWANCE. An allowance for flux decline and the associated increase in the transmembrane pressure which is required to maintain the specified capacity and to overcome the anticipated fouling of the membrane elements over and above the initial transmembrane pressure when the membrane elements are new and operating at design pressure, temperature, and recovery rate.
- G. MEMBRANE ELEMENT. A standard 8-inch diameter, 40-inch length, spiral wound membrane unit with an average active area of 400 square feet.
- H. MEMBRANE ELEMENT REPLACEMENT. Refers to replacement of the installed membrane elements with new elements. Membrane replacement does not include the addition of membranes to the system (i.e., membrane replacement does not increase the number of elements in a membrane unit) or chemically treating the membranes in order to modify the salt rejection.
- I. MEMBRANE UNIT. An individual control block containing an array of membranes that can be started or stopped individually.
- J. PERMEATE. The purified water which passes through the membrane itself and exits through the membrane product tube. The combined permeate from a unit is the purified water from all vessels and all stages of the membrane unit as it exits the unit through the permeate header. "Permeate" is distinguished from "product water" or "finished water" which may have been blended with raw or lime softened water or received additional treatment.
- K. PROCESS DESIGN. The process design referred to in this Section is the array of vessels and elements supplied under this Contract, the required operating pressure, system recovery, flux, salt rejection, system pressure drops, etc., required to produce the specified capacity at the specified permeate quality from the specified raw water quality, considering the feed temperature, membrane age, etc.
- L. RECOVERY. The ratio of permeate flow produced divided by the amount of feed water used to produce the permeate.

Addendum no.2 : Additions; ~~Deletions~~

REPLACEMENT OF NANOFILTRATION
PROCESS PRESSURE VESSELS AND
MEMBRANE ELEMENTS

MEMBRANE SYSTEM PERFORMANCE WARRANTY

- M. STAGE. A group of pressure vessels operating in parallel with the same quality feed water, also referred to as a bank.
- N. TERM OF WARRANTY. The duration of the warranties for each membrane unit and its installed membrane elements as defined in the section entitled MEMBRANE PERFORMANCE AND MEMBRANE ELEMENT REPLACEMENT of this Warranty. The term of warranty also applies to membrane performance.
- O. TOTAL (COMBINED) PERMEATE PRESSURE. The pressure of the combined permeate from all stages at the exit of the pressure vessels containing the membranes as measured upstream of the check valves and isolation butterfly valve on the permeate header at the same elevation as the feed pressure measurement. A function of the individual membrane plant piping arrangement.
- P. TRANSMEMBRANE PRESSURE for the individual membrane unit is defined as the difference in pressure between the membrane unit feed stream measured at the pressure tap located downstream of the automated valve on the membrane feed pump discharge header and the total (combined) permeate stream pressure measured at the pressure tap upstream of the train total permeate isolation valve at the same elevation as the feed pressure.

1.05 MEMBRANE SYSTEM WARRANTIES

A. MEMBRANE PERFORMANCE AND MEMBRANE ELEMENT REPLACEMENT

The Membrane Element Manufacturer (MEM) warrants for thirty-six months from the date of successful Performance Acceptance Test completion that each membrane unit will be capable of producing water at the quality specified in Table 01 77 55-1 and the quantity specified in Table 01 77 55-2

The performance is based on the feed water analysis and temperature provided in Table 01 77 55-1 and operating conditions described in Table 0 1741-2. In the event that actual feed water conditions differ from these values, the performance criteria specified in the section entitled MEMBRANE ELEMENT AND SYSTEM PERFORMANCE REQUIREMENTS of this Warranty shall be correspondingly adjusted using the latest version of the MEM's membrane process performance normalization software available as of the date of Award or similar normalization software submitted by the MEM and approved by the OWNER and ENGINEER. Calculation procedures used in this software should be consistent with procedures used in the latest revision of ASTM D4516 "Standard Practice for Standardizing Reverse Osmosis Performance Data" and industry standards.

The MEM agrees to the membrane element replacement conditions described herein in the event that the membrane elements fail to meet the performance requirements. In the event that the membrane elements in any treatment unit fail to meet the specified performance requirements during the thirty-six-month term of the warranty after the completion of the Performance Acceptance Test for that unit, and the performance cannot be restored by normal chemical cleaning, the MEM shall remove

Addendum no.2 : Additions; ~~Deletions~~

REPLACEMENT OF NANOFILTRATION
PROCESS PRESSURE VESSELS AND
MEMBRANE ELEMENTS

MEMBRANE SYSTEM PERFORMANCE WARRANTY

the failed membrane elements and replace them with new elements, ~~at no cost to the OWNER.~~ The cost of replacement membrane elements shall be based on the unit price listed in this Contract, discounted based on the age of the membrane elements relative to the three-year warranty period (e.g., replacements for membrane elements that have a one-year service life prior to out-of-warranty performance would be priced at a 66.6% discount). Treating the membranes with any chemicals to change the rejection or flux rates of the membranes is not acceptable.

The above warranty is contingent upon the OWNER operating the plant in accordance with the provisions of the section entitled SYSTEM OPERATION AND MAINTENANCE of this Warranty.

1.06 WATER QUALITY

- A. The membrane elements furnished by the MEM shall be warranted to produce the specified permeate quality and quantity from the projected membrane raw water listed below in Table 01 77 55-1.

1.07 MEMBRANE ELEMENT AND SYSTEM PERFORMANCE REQUIREMENTS

- A. The system performance requirements are summarized in Tables 01 77 55-1 and 01 77 55-2.
- B. The membrane elements furnished by the MEM for Membrane Units 1 through 7 are warranted to produce a capacity of 2.00 million gallons of permeate per unit per 24-hour day of operation. All membrane unit capacities shall be measured while producing the specified permeate quality and operating at the specified transmembrane pressure, feed temperature, recovery and with the raw water specified in Table 01 77 55-1.
- C. The permeate flow rate for each unit shall be determined by the MEM's standard normalization software available as of the date of Award or similar normalization software submitted by the MEM and approved by the OWNER and ENGINEER. Calculation procedures used in this software should be consistent with procedures used in the latest revision of ASTM 04516 "Standard Practice for Standardizing Reverse Osmosis Performance Data" and industry standards.
- D. Membrane permeate parameters listed above for which no value is indicated in the table, except pH, must meet Federal and State regulations for drinking water.

Addendum no.2 : Additions; Deletions

REPLACEMENT OF NANOFILTRATION
PROCESS PRESSURE VESSELS AND
MEMBRANE ELEMENTS

MEMBRANE SYSTEM PERFORMANCE WARRANTY

Table 01 77 55-1 Projected and Required Water Quality

Parameter	Unit	Projected Raw Water	Required Permeate
Bicarbonate ^(a) , ion	mg/L	322.1	25 to 75
Barium	mg/L	0.02	
Carbonate ^(a) , ion	mg/L	0.36	
Calcium	mg/L	94.4	
Chloride	mg/L	41.0	
Color	CU		<3.0
Carbon dioxide	mg/L	29.23	
Fluoride	mg/L	0.3	
Hydrogen Sulfide	mg/L		
Iron (Dissolved)	mg/L	0.7	<0.15
Magnesium	mg/L	5.1	
Nitrate	mg/L as NO ₃		
pH (non-acidified)	--	7.20	
Potassium	mg/L	3.4	
Silica	mg/L as SiO ₂	7.60	
Silt Density Index (Post Cartridge Filter) (15 min. @30 psi)	--		
Sodium	mg/L	45.0	
Strontium	mg/L	1.0	
Sulfate	mg/L	32.0	
Temperature	°C	26.5	
Total Dissolved Solids ^(b)	mg/L	553	<200
Total Hardness	mg/L as CaCO ₃	256.9	Minimum: 20
Total Organic Carbon	mg/L as C		<1.0
Total Trihalomethane ^(c) Formation Potential	mg/L		<0.040
Haloacetic Acid Formation Potential ^(d)	mg/L		<0.030

(a) At natural pH of well water, approximate pH = 7.2.

(b) TDS as sum of ions.

(c) At formation conditions of pH 8.5, chlorine dose of 6.0 mg/L, water temperature of 24° C, and 72 hours contact time.

(d) Total formation potential for the five haloacetic acids regulated under the Disinfectants/Disinfection By-Products Rule and at the conditions referenced for Total Trihalomethane Formation Potential.

Addendum no.2 : Additions; Deletions

REPLACEMENT OF NANOFILTRATION
PROCESS PRESSURE VESSELS AND
MEMBRANE ELEMENTS

MEMBRANE SYSTEM PERFORMANCE WARRANTY

Table 01 77 55-2 Membrane System Design Criteria

Parameter	Membrane Units 1-7
Total Permeate Capacity (mgd)	14
Number of Units	7
Permeate Capacity per Unit (mgd)	2.00
Design Recovery Rate (%)	87%
Maximum Transmembrane Pressure* During Performance Test (psi)	80
Membrane Element Diameter – Nominal (inches)	8
Element Length (inches)	40
Effective Membrane Area per Element (square feet)	400
Maximum Average Permeate Flux Rate per Unit (gfd)	13.7
Maximum Average Stage-One Permeate Water Flux (gfd)	14.8
Number of Membrane Elements per Pressure Vessel	7
Number of Stages per Unit	3
Number of Pressure Vessels per Unit	54
Number of First-Stage Pressure Vessels per Unit	32
Number of Second-Stage Pressure Vessels per Unit	16
Number of Third-Stage Pressure Vessels per Unit**	6
Number of Membrane Elements per Unit**	366

*Transmembrane Pressure is defined in the section entitled DEFINITIONS of this Warranty and is the feed pressure minus the total permeate pressure, both measured at same elevation. Permeate pressure at this plant varies between 20 and 23 psig.

**The existing units have spacers in positions 1 and 2 of the third-stage pressure vessels, so each third-stage vessel has only five elements installed.

- E. The membrane elements shall be warranted to produce the specified capacity of permeate with average flux rates not to exceed the values stated in Table 01 77 55-2. These average flux rates shall be calculated on the basis of 400 square feet per 8-inch by 40-inch long element. In addition to maximum average flux rates for the entire membrane unit, Table 01 77 55-2 also specifies a maximum average flux rate for the first stage. The first stage flux rate can be adjusted by applying a back-pressure of up to 6 psig to the first stage only as long as the overall unit transmembrane pressure specified in Table 01 77 55-2 is not exceeded.

- F. The membrane elements furnished by the MEM shall be warranted to produce the specified permeate quantity and quality at a transmembrane pressure not to exceed that specified in Table 01 77 55-2 during the seven-day performance test. In addition, the membrane elements furnished by the MEM shall be warranted to produce the specified permeate quantity and quality at a transmembrane pressure not to exceed the value specified in Table 01 77 55-2 over the life of the warranty period.

- G. The performance requirements will not apply if excessive or abnormal fouling has occurred on the membrane elements.

Addendum no.2 : Additions; ~~Deletions~~

REPLACEMENT OF NANOFILTRATION
 PROCESS PRESSURE VESSELS AND
 MEMBRANE ELEMENTS

MEMBRANE SYSTEM PERFORMANCE WARRANTY

1.08 SYSTEM OPERATION AND MAINTENANCE

- A. The OWNER agrees to operate the membrane softening system in accordance with the MEM's operating and maintenance instructions. The OWNER further agrees to provide a continuous supply of clean raw water to the system with water quality similar to that indicated above and the following additional operating guidelines (to be filled in by the MEM):

Maximum cleaning solution temperature: _____ degrees F
Maximum feed water SDI: <4.0 (based on 15 minutes)
Maximum feed water pH: _____
Minimum feed water pH: _____
Maximum cleaning solution pH: _____
Minimum cleaning solution pH: _____
Maximum cleaning solution flow pressure drop across the pressure vessel: ____
psi
Maximum flow of cleaning solution: 60 gpm/vessel

- B. The OWNER agrees to clean the membranes in strict conformance with the MEM's instructions regarding methods, cleaning agents, and frequency.
- C. The OWNER agrees to calculate the normalized system performance on a monthly basis using the MEM's standard normalization software available as of the date of Award or similar normalization software submitted by the MEM and approved by the OWNER and ENGINEER. The OWNER agrees to provide the MEM with monthly performance analysis reports using the MEM's normalization software.

1.09 ADMINISTRATION OF WARRANTY

- A. The OWNER agrees to notify the MEM in writing of a warranty claim for a performance or workmanship deficiency in accordance with the terms of this WARRANTY. The deficiency will be described in detail and supported by operational and water analysis data wherever possible.
- B. The MEM agrees to acknowledge receipt of the warranty claim within seven (7) calendar days of receiving the claim, and describe what action the MEM is planning to take.
- C. The MEM agrees to repair or replace membrane elements to restore performance within forty-five (45) calendar days of receipt of the warranty claim if membrane element performance or workmanship is found to have caused Warranty deficiency. For replacement of greater than 500 membrane elements, MEM and OWNER shall mutually agree upon a delivery schedule, not to exceed 90 days.
- D. The MEM shall have the right to request that the OWNER have the conductivity meter, flow meters and pressure gauges on the membrane unit associated with the warranty claim calibrated.

Addendum no.2 : Additions; ~~Deletions~~

REPLACEMENT OF NANOFILTRATION
PROCESS PRESSURE VESSELS AND
MEMBRANE ELEMENTS

MEMBRANE SYSTEM PERFORMANCE WARRANTY

- E. Special tests required to determine the performance deficiency will be done at the MEM's sole expense.
- F. All efforts, labor, expenses, etc., to prove that the membrane elements are fouled shall be borne by the MEM.

END OF SECTION

Addendum no.2 : Additions; Deletions

REPLACEMENT OF NANOFILTRATION
PROCESS PRESSURE VESSELS AND
MEMBRANE ELEMENTS

MEMBRANE SYSTEM PERFORMANCE WARRANTY

SECTION 46 63 23

MEMBRANE SYSTEM EQUIPMENT AND INSTALLATION

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Furnish all designs, materials, labor, equipment and incidentals required for the replacement of the membrane pressure vessels and membrane elements in the OWNER's seven existing nanofiltration (NF) units including the procurement of pressure vessels, piping, and associated equipment and replacement membrane elements, removal of existing pressure vessels and membrane elements and installation of new pressure vessels and membrane elements. This work shall include shop drawing preparation, procurement, installation, and testing. The seven existing 2.0 mgd NF membrane treatment units are described for reference purposes in Section 01 77 55 and shown on the Drawings provided in the Technical Data.

While the CONTRACTOR is responsible for all equipment, materials, and work under this Contract, certain services must be provided by the specified Membrane Element Manufacturer (MEM). Wherever in these specifications equipment or services are specified to be provided by the "MEM" (rather than "CONTRACTOR"), they shall be provided directly by qualified employee(s) of the MEM.

- B. The membrane pressure vessels and accessories shall be provided by CONTRACTOR. The membrane elements will be a hybrid configuration of Hydranautics ESNA1-LF-LD and ESNA1-LF2-LD membranes. These membranes shall be furnished under this Contract by the MEM. The membrane loading and performance test (described later in this section) will be conducted immediately following completion of the pressure vessel replacement work. The MEM shall be responsible for the performance of the membranes and monitoring the results of the Performance Test of each unit. The CONTRACTOR shall be responsible for rectifying any defects associated with the modification of the membrane units and loading of the membrane elements.
- C. The CONTRACTOR-provided equipment and services under this contract shall generally consist of the following:
1. Preparation of detailed shop drawings and detailed design of membrane unit modifications.
 2. Procurement and delivery of 378 replacement membrane pressure vessels and all necessary accessories for the OWNER's seven (7) NF units.
 3. Disassembly, removal, and off-site disposal of the existing pressure vessels and membrane elements and reinstallation of the new pressure vessels in place of the existing pressure vessels.
 4. Manufacture and installation of new permeate connections.
 5. Flushing of the membrane units after the modifications have been completed and cleaning and disinfection of the vessels and membrane unit.
 6. Bacteriological sampling and clearance of each NF unit immediately prior to membrane loading.
 7. Loading of new membrane elements in the new pressure vessels.

Addendum no.2 : Additions; ~~Deletions~~

8. Start-up and testing of each membrane unit.
9. The above improvements shall be planned, scheduled, and executed so that no more than one NF unit will be out of service at any given time.
10. Correction of any defects associated with the membrane unit modification or membrane element installation.
11. Operation and maintenance training manuals for the equipment used in the membrane unit modifications.

1.02 DEFINITIONS

- A. MEM – The Membrane Element Manufacturer (MEM) is responsible for manufacturing and supplying the membrane elements. The MEM shall be Hydranautics, and shall be responsible for all services specified herein to be provided by the MEM.
- B. Selected available record drawings of the existing NF system are provided as Technical Data and are bound into this document for the CONTRACTOR's convenience.

1.03 RELATED WORK

- A. Section 01 78 23: Operation and Maintenance Data
- B. Section 01 77 55: Membrane System Performance Warranty
- C. Section 46 63 11: Membrane Elements and MEM's Services

1.04 DESCRIPTION OF THE EXISTING MEMBRANE SYSTEM

- A. The OWNER intends to have its seven existing 2.0 mgd NF membrane units modified as specified herein. This section summarizes the features of the existing membrane units and the projected performance after membrane and vessels replacement. The overall configuration for the membrane system is summarized in Section 01 77 55.
- B. The pretreatment system consists of cartridge filters and the dosing of antiscalant and sulfuric acid.
- C. Membrane system design criteria are specified in Paragraph 2.01 of this Section. Membrane unit configuration is specified in Section 01 77 55.
- D. Permeate water from the membrane units is directed to a degasification system for post-membrane treatment as shown and specified elsewhere.
- E. Concentrate water from the membrane units is directed to a deep injection well system.

1.05 SUBMITTALS

- A. All materials required to establish compliance with these specifications shall be submitted in accordance with the provisions of Section 01 33 00. It is important that the CONTRACTOR read and understand the provisions of Section 01 33 00, regarding drawing submittals.

Addendum no.2 : Additions; ~~Deletions~~

B. Submittals for the membrane system modifications shall include at least the following:

1. Descriptive literature, bulletins, and/or catalogs of the equipment.
2. A bill of materials for all equipment.
3. A list of spare parts recommended by the CONTRACTOR. The documentation of spare parts (submittal) shall be submitted with hardcopies and electronic Excel file format using the electronic Excel file provided by the City, a hardcopy of which is provided in Section 01 99 90.
4. Scaled engineering drawings of the portions of the existing membrane units that will interface with new replacement materials and equipment, giving physical dimensions of the pressure vessels and arrangements of interconnecting piping and accessories. Based on field measurements during development of these specifications, it appears that the specified replacement pressure vessels will be a "like kind" replacement of the existing pressure vessels, except that the existing permeate connections (J-bends) for the individual pressure vessels will need to be replaced. The CONTRACTOR shall make their own field-verification of all dimensions of the existing vessels and interfacing piping, structural supports, nozzles, accessories, etc. as necessary to ensure compatibility of the new pressure vessels with the existing system and to plan and sequence the pressure vessel replacement and membrane element replacement work in accordance with the contract requirements. Sketches of the proposed pressure vessels interfacing with the existing NF unit structure and piping are provided for the CONTRACTOR's reference at the end of this Section.
5. Resumes of the experienced membrane process and applications engineer employed by the CONTRACTOR who will in responsible charge of the detailed design and shop drawings and the CONTRACTOR's representative that will provide supervision of installation of the system modifications.
6. Corporate experience and resumes of key technical personnel utilized by the CONTRACTOR. Corporate experience information shall include a listing of all low pressure membrane projects completed by the CONTRACTOR within the past five calendar years.
7. Shop drawings and specifications for all purchased equipment.
8. A sample of the permeate connection proposed.

1.06 OPERATION AND MAINTENANCE MANUALS AND TRAINING

- A. Complete operation and maintenance (O&M) manuals for the equipment provided under this contract in accordance with the requirements of Section 01 78 23.

1.07 TOOLS AND SPARE PARTS

- A. All special tools required for normal operation and maintenance of the equipment shall be furnished by the equipment manufacturer.
- B. Spare parts, as specified in this section shall be furnished.

Addendum no.2 : Additions; ~~Deletions~~

1.08 ENGINEERING AND WARRANTY SERVICES PROVIDED BY THE CONTRACTOR/MEM

- A. The CONTRACTOR shall prepare the portions of the O&M manual submittals pertaining to the membrane unit modifications.
- B. The MEM shall be responsible for the performance of the membrane elements and their ability to meet the stated water quality goals.

1.09 MEMBRANE SYSTEM WARRANTY

- A. The CONTRACTOR shall provide a one-year warranty on materials and workmanship for the equipment provided in accordance with the General Conditions and Supplementary Conditions.

PART 2 - EQUIPMENT AND MATERIALS

2.01 MEMBRANE SYSTEM GENERAL DESIGN CRITERIA

- A. The CONTRACTOR shall provide the services of an experienced membrane process and applications engineer for the design, installation, startup and testing of the membrane system modifications. The CONTRACTOR's membrane process and applications engineer shall have experience with similar size and type of membrane plants and shall be approved by the ENGINEER.
- B. The membrane system equipment covered by these Specifications is intended to incorporate standard membranes and equipment designs with proven abilities as manufactured by reputable firms having long experience in the manufacture of membrane system equipment.
- C. All pressure vessels shall be manufactured by the same manufacturer.
- D. All equipment shall be designed for continuous service at maximum operating pressures.
- E. Provisions shall be made for easy replacement of membrane elements and all other parts. Corresponding parts of multiple units shall be interchangeable.
- F. The membrane system is designed to treat raw water from Biscayne aquifer wells to potable quality. The membrane system design criteria are summarized in Section 01 77 55.

2.02 MEMBRANE SYSTEM CONFIGURATION

- A. The seven (7) 2.0 mgd membrane units are designed to operate at 87% recovery using three stages.
- B. Membrane Unit Configuration. The MEM shall base their bid on the membrane unit configuration as described in Section 01 77 55 and the modifications specified herein.

Addendum no.2 : Additions; ~~Deletions~~

2.03 MEMBRANES

- A. The membrane elements shall be furnished by the MEM as specified in Section 46 63 11.

2.04 PRESSURE VESSELS

- A. Pressure vessels for the membrane units shall have a diameter and length so as to contain seven (7) standard eight-inch diameter by 40-inch standard length spiral wound elements. Pressure vessels shall be manufactured in the United States. Pressure vessels shall be side entry Model Pro 8-300-SP as manufactured by Bekaert Progressive Composites Inc, or Model 80A30 as manufactured by Code Line Division of Pentair Water Treatment.
- B. Vessels shall have a maximum working pressure of not less than 300 psi at a temperature of not less than 120 degrees F with a minimum operating temperature of not greater than 20 degrees F.
- C. Vessels shall be designed, constructed, inspected and stamped in accordance with the latest edition of the ASME Boiler and Pressure Vessel Code - Section X, Fiberglass - Reinforced Plastic Pressure Vessels.
- D. Vessels shall be complete with end closures, mounting hardware, and membrane element end connectors appropriate for the membrane element being supplied. Vessel shall be designed to allow the use of other makes of membranes by changing end connectors.
- E. Vessels shall be designed to allow membrane elements to be connected to the permeate port at both ends of the vessel so that permeate can be taken from either end of the pressure vessel.
- F. Pressure vessels shall include the following features:
 - 1. Each side-ported feed/concentrate port shall be constructed of 316L stainless steel and shall be designed to interface with a 1-1/2-inch flexible groove-joint coupling. Each side ported feed/concentrate port shall incorporate a flush-face elastomeric seal that seals directly to the inside diameter of the vessel shell so that edge laminate surfaces are not exposed and dead spaces are eliminated. The center-to-center distance between side ports shall be 285 inches.
 - 2. Permeate ports on the permeate manifold end shall be 1-1/4 inch diameter groove-joint with pressure rating of 125 psig. Permeate ports on the other end shall be 1-inch FPT. The CONTRACTOR shall provide all necessary 316 stainless steel fittings, and a 3/8-inch 316 stainless steel ball valve, on each vessel to allow probing of the permeate tube within the vessel.
 - 3. The head seal gland shall be designed to eliminate dead space and to allow the seal surface to be exposed for flushing of the seal. Each permeate port shall be designed with an anti-rotation mechanism so that piping may be easily tightened.

Addendum no.2 : Additions; ~~Deletions~~

4. The primary means for head retention shall be a 302 stainless steel, three turn, single piece retaining ring. Each head shall contain an integral secondary interlock that requires a specific sequence of events to remove the end closure and shall not require the use of separate components that may become separated from the vessel.
- G. Materials of construction shall be approved for use in pressure vessel construction by the ASME Boiler and Pressure Vessel Code. Materials shall be code certified and lot traceable.
- H. The vessel shall be fabricated from filament wound fiberglass using continuous glass roving impregnated with an elevated cure epoxy resin. Materials shall be lot traceable to vessel serial numbers.
- I. All vessels shall be painted in the factory. Prior to painting, each vessel shall be sanded to promote adhesion of the coating to the shell. Each end bell and body wall shall be free from grinding or sanding marks. The length of the body wall between the end bells shall be straight and smooth, and without any lumpiness that may indicate filament-winding inconsistency. The paint system shall be a two-part poly-urethane enamel, Devco Devthane 379UVA, or approved equal. The paint system shall be applied in a two-step process. First, a light tack coat shall be applied over the entire vessel followed by a final topcoat. The final paint thickness shall be 5 mils. Paint coatings shall be completely opaque to light.
- J. All vessels shall be made of non-corrosive materials. Metal parts in contact with the process stream shall be stainless steel type 316 or equal as approved by the ENGINEER.
- K. The following spare parts shall be provided:
1. 6 complete head assemblies – 3 of each permeate port type with finger pull retaining rings.
 2. 20 F/C seals and retaining rings.
 3. 20 seals for head assemblies – permeate port, permeate port adapter, head seal.
 4. 20 perm permeate port retaining rings.
 5. 4 of each permeate ports.
 6. 2 T-pulls or head removal tools.
 7. 4 membrane adapters and 20 PWT seals.
 8. 4 thrust cones.
 9. 28 1.5-inch 316 stainless steel groove-joint couplings with gaskets.
 10. ~~28~~ 14 1.25-inch 316 stainless steel groove-joint couplings with gaskets.
 11. 14 Schedule 10 316 stainless steel 1.25-inch diameter groove-joint permeate J-bends.

2.05 MEMBRANE UNIT SUPPORT STRUCTURE

- A. The pressure vessel assemblies shall be adequately supported on the support structure by plastic, contoured saddles or cradles and stainless steel retaining clamps. Three saddles and two support straps are to be provided with each vessel.

Addendum no.2 : Additions; ~~Deletions~~

- B. In the event that the holes for the vessel straps need to be redrilled or enlarged or if the paint system on the frames is damaged, the frames shall be touch up painted to protect any exposed metal. The touch up paint will be applied with a three part paint system which includes a stripe coat of Series 90-97 by Tnemec, a 1st coat of Series N69 by Tnemec, and a topcoat of Series 73 by Tnemec.
- C. All mounting hardware and bolting for pressure vessels, manifolds, and other membrane unit support structure components shall be 316 stainless steel.

2.06 PROCESS PIPING

- A. All existing permeate J-bends shall be replaced in kind with 1.25-inch diameter Schedule 10 316 stainless steel groove-joint bends. All pipe fabrications shall be pickled and passivated by immersion in acid after fabrication. Alternate methods will not be accepted. All piping welds shall be full penetration welds done by AWS certified welders.
- B. The piping shall be at least Schedule 10, Type 316L (ASTM A-312) stainless steel seamless pipe.
- C. All existing groove-joint couplings and gaskets shall be replaced with the new pressure vessels (~~three~~four per pressure vessel). Couplings shall be all 316 stainless steel by Victaulic, Piedmont, or equal.

PART 3 - EXECUTION

3.01 COORDINATION OF THE CONTRACTOR WITH THE MEM

- A. The CONTRACTOR and CONTRACTOR shall notify the OWNER, MEM and ENGINEER by certified mail that the CONTRACTOR will be ready to commence loading the new membranes into unit number one 14 days prior to the date that the CONTRACTOR will have completed the installation of the new vessels and all associated piping modifications and will have cleaned and disinfected the vessels so that they will be ready for membrane element loading. The ENGINEER will then coordinate with the OWNER and the CONTRACTOR a date for the Membrane Element Pre-installation meeting.

3.02 CONTRACTOR'S RESPONSIBILITY PERTAINING TO MEMBRANE ELEMENTS

- A. The CONTRACTOR and CONTRACTOR shall be responsible for any damage to the membrane elements associated with the handling of membrane elements during the membrane loading process. If loading and unloading of any membrane elements is necessary due to problems associated with membrane loading, any damage to the membrane elements associated with handling of the membrane elements during these operations will be the responsibility of the CONTRACTOR.
- B. If there is damage to membrane elements as a result of the CONTRACTOR's and CONTRACTOR's handling of the membrane elements as described above, the damaged membranes shall be replaced with new identical membrane elements at the expense of the CONTRACTOR.

Addendum no.2 : Additions; ~~Deletions~~

3.05 MEMBRANE ELEMENT PRE-INSTALLATION MEETING

- A. Representatives of the CONTRACTOR and MEM shall attend a membrane element pre-installation meeting with the OWNER and ENGINEER to review the procedure for installation of the membrane elements into the membrane units as describe above.

3.06 REMOVAL AND INSTALLATION OF MEMBRANE ELEMENTS

- A. The CONTRACTOR shall provide supervision, labor, tools, construction equipment, incidental material, and necessary services required to remove the existing pressure vessels, install new replacement pressure vessels, and make the NF units ready for installation of the new membrane elements. The CONTRACTOR and MEM shall provide supervision, labor, tools, equipment, and materials to install membrane elements in the new pressure vessels and complete start-up and testing of each NF unit.
- B. The MEM shall provide a representative on site during the membrane installation process to certify that the membrane elements have been installed correctly and that the installation work conforms to the MEM's recommended procedures, instructions, and approved shop drawings. The CONTRACTOR shall provide on-site supervision and labor for the installation of all the membrane elements into the membrane units.
- C. Membranes shall not be installed until a system disinfection flush of the membrane units, pressure vessels, and associated piping has been completed.
- D. Membranes shall not be loaded until it has been demonstrated that membrane unit has been sufficiently cleaned and flushed. The CONTRACTOR shall allow sufficient time for these activities and shall make provisions for disposal of the flush water to acceptable areas, as determined by the ENGINEER and OWNER, during the flushing activities. Temporary connections to the sewer or the deep well shall be provided if necessary.
- E. If the MEM requires that the membranes be loaded in a specific order, the MEM shall provide this information to the CONTRACTOR and shall pack and organize the elements in a manner that is consistent with the loading schedule. The MEM's on-site representative shall assist the CONTRACTOR with coordinating the loading schedule.
- F. In order to prevent bacteriological contamination of the membranes, the CONTRACTOR and MEM shall ensure that unpackaged membrane elements are not placed in direct contact with the ground, floor, standing water, or dirt, and will instruct installers to maintain sanitary and clean conditions.
- G. Prior to loading membranes, the pressure vessels shall be swabbed out and disinfected with clean rags soaked in chlorine solution. All spillage shall be cleaned up immediately to prevent damage and corrosion of adjacent equipment.
- H. All piping, end caps, and membrane interconnectors shall be disinfected by soaking in a hypochlorite solution. Care shall be taken not to contact the membranes with hypochlorite solution because it will damage the membranes.

Addendum no.2 : Additions; ~~Deletions~~

- I. It is the intention of this Contract to load membranes into one unit at a time and to complete performance testing of the membrane units as described in Paragraph 3.09.
- J. The CONTRACTOR shall use only equipment that may be supported by the existing floor grating system (rated load 330 pounds per square foot) for the work in the membrane process bay, and shall take care to avoid damage to the existing floor grating, flooring, and other surfaces within the building.
- K. The existing pressure vessels and membrane elements will become the property of CONTRACTOR and shall be removed from the site within 15 days of their removal from the membrane units.

3.07 MEMBRANE SYSTEM EQUIPMENT INSTALLATION

- A. The CONTRACTOR shall provide the services of an experienced membrane unit Installation Supervisor on-site to supervise the installation of membrane pressure vessels and associated equipment. The CONTRACTOR shall submit the qualifications of the Installation Supervisor to the ENGINEER for approval.
- B. The duties of the Installation Supervisor shall include the following for each item of membrane system equipment furnished. These are subject to all limitations and requirements directed by the ENGINEER or specified elsewhere.
 - 1. Give all necessary instructions for proper unloading and installation and testing of the membrane pressure vessel, piping modifications and associated equipment.
 - 2. Be present at the work at all times necessary for proper supervision.
 - 3. Coordinate with the MEM in the supervision of membrane element loading.

3.08 STARTUP AND TESTING

- A. Prior to initiation of the specified startup and testing activities, a coordination meeting shall be held by the CONTRACTOR with the OWNER, OWNER'S operators and the ENGINEER and the MEM. The OWNER and ENGINEER shall be notified of the meeting at least ten (10) calendar days in advance. The CONTRACTOR shall coordinate with the MEM and shall submit a detailed startup and testing plan to be submitted at least 30 days prior to the Startup Coordination Meeting. This plan shall be submitted in writing to the OWNER and ENGINEER and shall clearly indicate anticipated flows, duration of flows, nature of the content of the produced streams, the piping and handling arrangements for the produced stream, the intermediate storage structure for the produced streams, and the ultimate disposal point for each produced stream. The Test Plan shall outline the sequence for preservative flushing, bacteriological clearance, startup, and Performance Testing of all units. The test plan shall include the test procedures, sequences and schedule, operational checks, any required changes to alarm setpoints, checklists, and data log sheets. OWNER and ENGINEER shall review and approve the plan prior to initiation of the removal of the existing membrane elements.
- B. Disinfection and Flushing: Prior to loading membranes, the pressure vessels shall be swabbed out and disinfected with clean rags soaked in chlorine solution. The CONTRACTOR shall provide temporary piping to flush each unit as required. Flushing

Addendum no.2 : Additions; ~~Deletions~~

shall be accomplished by flowing feed water through the pumps and feed piping through empty pressure vessels, exiting through the concentrate and permeate lines. Flushing shall continue until all air pockets have been removed from piping and pressure vessels and no chlorine can be detected. The CONTRACTOR shall provide temporary piping from each NF unit combined permeate piping to allow the membrane preservative solution to be flushed to waste upon startup of the unit immediately following loading of the new membranes. Permeate shall be flushed in accordance with the MEM's recommended guidelines. Disposal of the flushing water shall be to the sewer, the deepwell or to another disposal point agreed to by the OWNER.

- C. Functional Testing. Prior to loading membranes, the CONTRACTOR shall conduct a functional test of each unit. The unit shall be operated in both the normal operating mode and the cleaning configurations for both sections of the first stage and the second stage. This testing is to confirm that the valves and connections are functioning properly and that there are no obstructions or restrictions in flow that would adversely impact the operation of the unit or performance testing.
- D. It is the intent of the OWNER to utilize the permeate water during the 7-day performance test periods to satisfy distribution system demand.
- E. Leak Testing. All new piping and equipment shall be leak tested by the CONTRACTOR and witnessed by the ENGINEER. After installation of the membranes, the membrane units shall be started and the pressure to the membrane units shall be increased in increments to allow identification and repair of leaks prior to reaching normal system operating pressure. All trapped air shall be removed from piping and pressure vessels prior to reaching normal operating pressure.

3.09 MEMBRANE PERFORMANCE TESTING

- A. Performance testing of the membrane system shall be scheduled by the OWNER and MEM. Substantial Completion for the membrane system will be contingent upon successful completion of the performance testing of all membrane units. Substantial Completion for the CONTRACTOR will be contingent upon successful completion of the performance testing of all membrane units in terms of the functional operation of the equipment and repairs provided by the CONTRACTOR and the correction of any membrane installation problems. The CONTRACTOR will be allowed to submit an application for payment for Partial Utilization of each membrane unit upon successful completion of the first three days of operation of the membrane unit during the Performance Test for that unit.
- B. Services during the performance test. The CONTRACTOR shall provide the following services with respect to the Performance Test of each unit:
 - 1. Supervision, labor, tools, construction equipment, incidental material, and necessary services required for the initial installation of the membrane elements.
 - 2. Have a representative present for the startup and initial three days of operation of each membrane unit.

Addendum no.2 : Additions; ~~Deletions~~

3. Repair all leaks and correct any defects with respect to work performed by the CONTRACTOR.
 4. Provide supervision, labor, tools, construction equipment, incidental material, and necessary services for unloading and reloading membrane elements in any vessels that appear to have leaks at “O”-rings or other problems associated with the installation of the membranes in the pressure vessels.
 5. During the performance test, the CONTRACTOR should be prepared to perform the work outlined above within 24 hrs of receiving notice from the ENGINEER.
- C. To the maximum extent possible, it is intended that all seven membrane units shall be tested continuously for seven (7) consecutive days, 24-hours per day. Depending on the City’s water supply needs, it may be necessary to shutdown and restart membrane units as required by system demands. The sequence of testing shall be as follows: The 7-day performance test for the first unit shall be commenced upon approval of the testing plan by ENGINEER. Testing of subsequent units shall not commence until the 7-day test of the preceding unit has been satisfactorily completed.

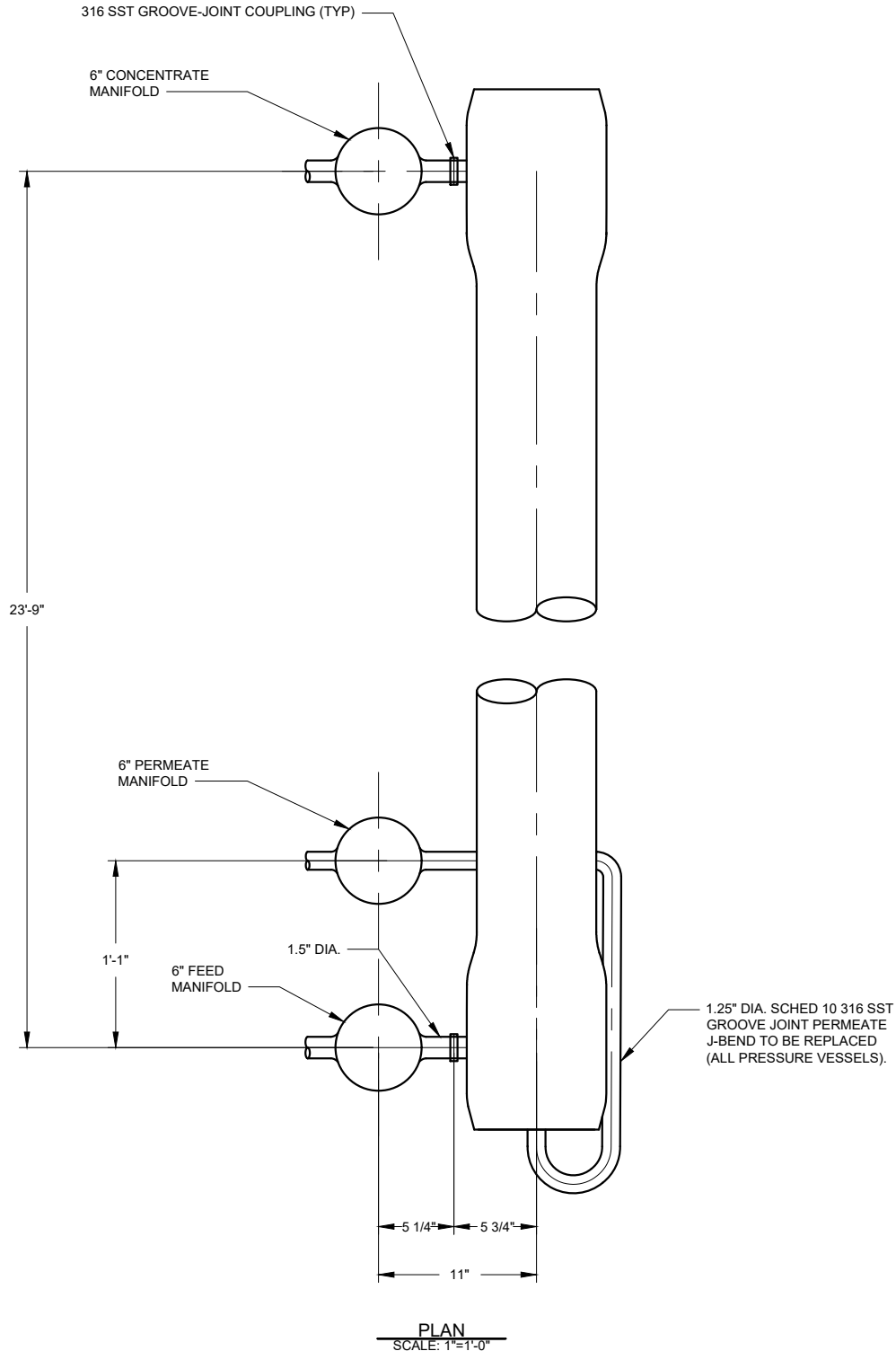
3.10 MEMBRANE SYSTEM TRAINING

- A. The CONTRACTOR shall provide the services of a qualified technical representative for two four-hour training sessions to instruct the OWNER’s personnel on proper operation and maintenance of the modified membrane system (one session for operation and one session for maintenance). The CONTRACTOR shall also instruct the OWNER’s personnel on the maintenance of the pressure vessels and equipment provided under this contract. Training and manufacturer’s services shall also include a total of three days of the pressure vessel manufacturer’s field service manager’s time for final inspection of installation, and Owner training addressing normal installation, assembly, disassembly, and maintenance procedures, troubleshooting, leak testing, etc. for the pressure vessels. Training sessions shall be videotaped by the CONTRACTOR, and the tape delivered to the Owner for future reference.

3.11 PROJECT CLOSEOUT

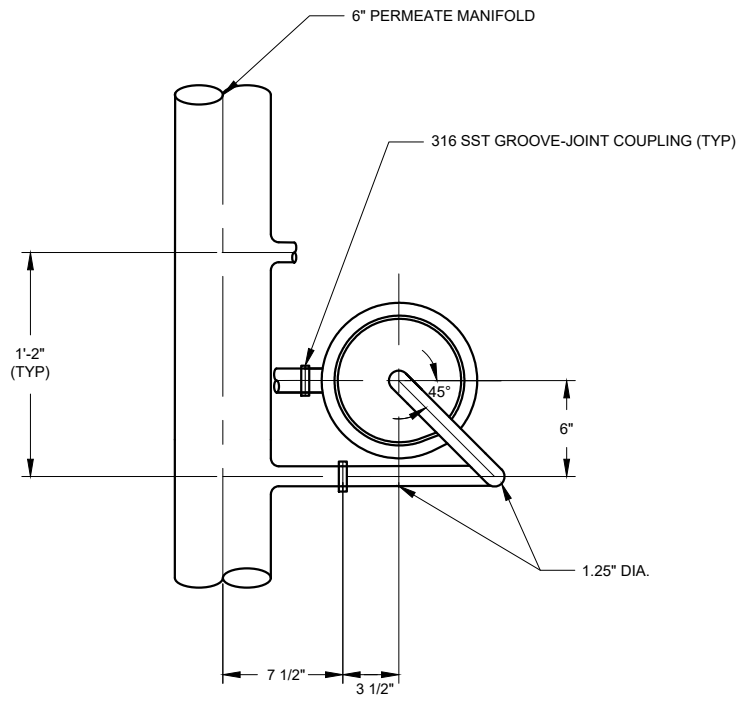
- A. The CONTRACTOR, prior to requesting final payment, shall obtain and submit the following items to the ENGINEER for transmittal to the OWNER:
1. Written materials and workmanship warranty, where required.
 2. Releases from all parties who are entitled to claims against the subject project pursuant to the provisions of law.

NOTE: DIMENSIONS ARE PROVIDED FOR PRICING PURPOSES ONLY. CONTRACTOR SHALL FIELD-VERIFY ALL DIMENSIONS AND THE CONFIGURATION OF THE EXISTING PIPING AND NF UNIT STRUCTURE AS NECESSARY TO SELECT PRESSURE VESSELS AND FABRICATE REPLACEMENT PERMEATE J-BENDS TO BE COMPATIBLE WITH THE EXISTING NF UNIT CONFIGURATION. CONTRACTOR SHALL SUBMIT DIMENSIONED LAYOUT DRAWINGS BASED ON FIELD MEASUREMENTS TO ENGINEER FOR APPROVAL PRIOR TO RELEASING PRESSURE VESSELS AND J-BENDS.

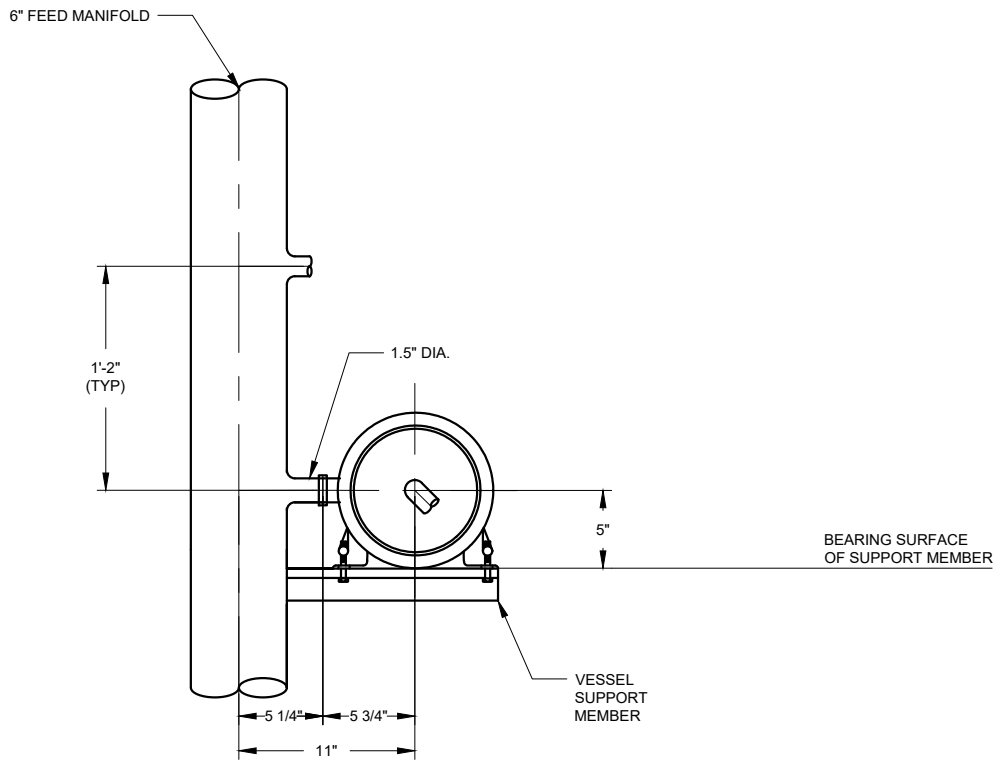


File: \\MCC\BIC Public\Shared\Project Files\Brown and Caldwell\Hollywood\18.06 Hollywood Membrane Element Replacement\Design\Drawings\CAD\Figure 1.dwg

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END VIEW WITH PERMEATE MANIFOLD
SCALE: 1"=1'-0"



END VIEW WITH FEED MANIFOLD
SCALE: 1"=1'-0"

File: \\MCC\B\C\Public\Shared\Project Files\Brown and Caldwell\Hollywood\18-06 Hollywood Membrane Element Replacement\Design\Drawings\CAD\Figure 2.dwg

END OF SECTION