ISSUE DATE: November 18, 2019

NOTICE

REQUEST FOR PROPOSALS

FOR

ENGINEERING SERVICES FOR HAMLIN WATER RECLAMATION FACILITY PHASE 2 IMPROVEMENTS

RFP #Y20-812-TA

The Board of County Commissioners, Orange County, Florida, is accepting sealed Proposals to be received **NO LATER THAN 2:00 P.M. (local time) on December 19, 2019, for ENGINEERING SERVICES FOR HAMLIN WATER RECLAMATION FACILITY PHASE 2 IMPROVEMENTS.**

A Non-Mandatory Pre-Proposal Conference will be held **December 3, 2019**, at **1:30 PM** at the **Utilities Administration Building, 2nd Floor Conference Room, 9150 Curry Ford Road, Orlando, Florida 32825**. Interested Proposers are encouraged to attend.

Proposals will be accepted at:

Orange County Procurement Division
Internal Operations Centre II
400 East South Street, Second Floor
Orlando, Florida 32801
(407) 836-5635

Copies of the Request for Proposals may be obtained from the Orange County Procurement Division at the above address. Copies may also be requested by phone (407) 836-5635.

NOTE: This Request for Proposals is available for downloading from the internet at orangecountyfl.net.

Carrie Mathes, MPA, CFCM, CPPO, C.P.M.
Manager, Procurement Division

NOTICE TO PROPOSERS

To ensure that your Proposal is responsive, you are urged to request clarification or guidance on any issues involving this solicitation before submission of your response. Your point-of-contact for this solicitation is Tracy Attenasio at (407) 836-5696, Tracy.Attenasio@ocfl.net. **You may contact Tracy Attenasio at any time during this process, including during the blackout period.**

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FOR
ENGINEERING SERVICES FOR HAMLIN WATER RECLAMATION FACILITY PHASE 2 IMPROVEMENTS
RFP # Y20-812-TA

PURPOSE:

The Board of County Commissioners, Orange County, Florida, is soliciting Proposals to provide ENGINEERING SERVICES FOR HAMLIN WATER RECLAMATION FACILITY PHASE 2 IMPROVEMENTS.

INSTRUCTIONS TO PROPOSERS:

Firms or companies desiring to provide services, as described herein, shall submit one (1) Proposal (clearly marked), nine (9) copies (a total of 10 Proposals) and one (1) electronic copy on a USB drive for document management purposes not later than 2:00 P.M. local time, December 19, 2019, to:

Orange County Procurement Division
Internal Operations Centre II
400 E. South Street, 2nd Floor
Orlando, Florida 32801

If your response contains any information deemed confidential, in accordance with Chapter 119 of the Florida Statutes, provide an additional USB drive with a redacted version of your response labeled REDACTED. Electronic copy shall be in Microsoft Word or Adobe – the most recent software version.

Respondents are cautioned that they are responsible for delivery to the specific location cited above. Therefore, if your Proposal is delivered by an express mail carrier or by any other means, it is your responsibility to ensure delivery to the above address. This office will not be responsible for deliveries made to any place other than the specified address.

A Non-Mandatory Pre-Proposal Conference will be conducted on December 3, 2019 at 1:30 P.M, Utilities Administration Building, 2nd Floor Conference Room, 9150 Curry Ford Road, Orlando, Florida 32825. All interested parties are urged to attend.

1. The time and date for receipt of proposals will be strictly observed. The County shall not be responsible for late deliveries or mail delays. The time/date stamp clock in the Procurement Division shall serve as the official authority to determine timeliness of the Proposal.

2. **The decision to refuse to consider a proposal that was received beyond the date/time established in the solicitation shall not be the basis for a protest pursuant to the Orange County (Procurement Ordinance).**

3. Proposals received after the specified time and date shall be returned unopened. The decision to refuse to consider a proposal that was received beyond the date/time established in the solicitation shall not be the basis for a protest pursuant to the Orange County (Procurement Ordinance). All proposals will be opened publicly and the names of all Proposers shall be read aloud.

4. Proposers must submit ONLY the attached forms, lettered A through P, in the same order as presented herein. Failure to submit all forms may result in disqualification of your Proposal. **However, failure to submit forms B, C, D, E, F, H and J may negatively impact the evaluation of the Proposal.** This shall also apply to Form K if the Proposer is submitting as a Joint Venture.

   The County shall not be responsible for re-calculation or interpretations of information provided on any form.

   NOTE: These forms are periodically edited. Proposers must use the forms as they appear herein for this project. Form G is not used.

5. Modification or alteration of the documents contained in this solicitation or the contract resulting from this solicitation shall only be made upon receipt of prior written consent of the County.

6. The submission of GSA Forms 254 or 255 are not acceptable. The submission of these forms shall result in disqualification of your Proposal as non-responsive.

7. Proposers are instructed NOT to include pictures, drawings, graphs, dividers or table of contents. Submittal of pictures, drawings, graphs, dividers and/or table of contents may result in disqualification of your Proposal as non-responsive. Do not use a cover or binder. Use one (1) staple in UPPER left-hand corner only.

8. With respect to Forms D, E, F and H, no sideways printing on pages will be permitted. Also with respect to Forms D, E, F and H, print must be no smaller than 12 point when using a computer, or must be 10 pitch when using a typewriter.

9. Faxed Proposals shall be rejected as non-responsive, regardless of where the fax is received.

10. Proposers must indicate on their proposal envelope the following:

    Request for Proposals Number Y20-812-TA
    Date of Opening - December 19, 2019
    Name of Proposer
    Return Address of the Proposer

11. Proposers shall not contact any member of the Orange County Procurement Committee or any staff (except as provided below) regarding this Proposal until such time as a contract is awarded. All inquiries pertaining to this Request for Proposal must be directed through the Procurement Division.

12. Questions concerning this Request for Proposals must be directed to >name, Contracting Agent, Tracy.Attenasio@ocfl.net. Any Proposer who initiates any discussions with staff in any manner other than that described above is subject to disqualification from this procurement.

13. Information regarding Procurement Committee scheduling and Board approvals are available by calling the Procurement Division Reception Desk at (407) 836-5635 or by accessing the Procurement Committee schedule at http://apps.ocfl.net/OrangeBids/Procurement/default.asp. Also, an email notice of the Procurement Committee meeting will be sent to all Proposers.

14. Technical concerns/questions shall be submitted in writing, no later than 4:00 p.m. on December 6, 2019 to:

Tracy Attenasio, Contracting Agent
Procurement Division
400 E. South Street, 2nd Floor
Orlando, Florida 32801
Tracy.Attenasio@ocfl.net

You may contact Tracy Attenasio at any time during this process, including during the black out period.

15. ORAL INTERPRETATION

No oral interpretation of this Request for Proposals shall be considered binding. The County shall be bound by information and statements only when such statements are written and executed under the authority of the Manager of the Procurement Division.

16. DRUG FREE WORKPLACE

The Drug Free Workplace Form (Form L) is attached and shall be completed and submitted with your proposal.

17. DRAFT CONTRACT

The contract that the County intends to use for award is enclosed for reference. Any exceptions to this standard contract must be clearly indicated by return of the standard contract with the Proposal, with exceptions clearly noted. The County has the right to require the selected Proposer to sign the attached contract or to negotiate revisions to the contract language prior to execution of the contract, at its discretion.

18. WITHDRAWAL OF PROPOSAL

Any proposal may be withdrawn until the date and time set above for the submission of the proposals. Any proposals not so withdrawn shall constitute an irrevocable offer, for a period of one hundred and twenty (120) days, to provide to the County the services set forth in this Request for Proposals, or until one or more of the proposals have been awarded.

19. SOLICITATION CANCELLATIONS

Orange County reserves the right, and the Manager of the Procurement Division has absolute and sole discretion, to cancel a solicitation at any time prior to approval of the award by the Board of County Commissioners when such approval is required. The decision to cancel a solicitation cannot be the basis for a protest pursuant to the Orange County Code.

TERMS AND CONDITIONS:

1. A minimum coverage of Professional Liability Insurance in the amount of $1,000,000 (with a deductible permitted not in excess of $100,000) will be required for this project.

2. Selection shall be in accordance with F.S. 287.055 and the County's adopted selection procedures.

3. The County reserves the right to accept or reject any or all Proposals that it may in its sole discretion deem non responsive, to waive technicalities, or to accept the Proposal which, in its sole judgment, is most advantageous and best serves the over-all interests of the County.

4. The County reserves the right to request clarification of information submitted and to request additional information of one or more Proposers after the deadline for receipt of Proposals.

5. Any Proposal may be withdrawn until the date and time set above for the submission of the Proposals.

6. By submission of a Proposal, the Proposer agrees that all costs associated with the preparation of his/her Proposal will be the sole responsibility of the Proposer. The Proposer also agrees that the County bears no responsibility for any costs associated with the preparation of the Proposal and/or any administrative or judicial proceedings resulting from the solicitation process.

7. Proposers must not discriminate against any employee or applicant for employment because of race, religion, color, sex, age or national origin.

8. <u>MINORITY/WOMEN OWNED BUSINESS ENTERPRISE:</u>

A. Proposers must address how they intend to comply with the Orange County M/WBE Ordinance, No. 94-02 and amended by Ordinance No. 2009-21. The goal of certified minority/women business enterprise is 27% of the contract value for this project. The Ordinance also addresses minority/women group employment levels setting goals to encourage each Proposer to maintain 24% minority and women employee workforce levels in specific categories.

B. All participating M/WBE firms must be **currently certified by Orange County**. The Business Development Division's most recent M/WBE directory is available by e-mail or through the Orange County web site at OrangeCountyfl.net. **Only firms having established offices in the Orlando MSA (Orange, Lake, Seminole and Osceola Counties) are eligible for Orange County certification. All firms must be Orange County certified at time of submittal of the Proposal and must be certified in the area(s) for which they will be used.**

If a firm claims to be certified, but is not listed in the Directory the Proposer should obtain a copy of their Orange County Certificate and/or contact the Business Development Division at (407) 836-7317 for verification of certification.

C. The County has program whereby M/WBE firms designated as graduates can participate in the M/WBE program only on specified projects. All professional service solicitations for which the County has estimated the overall contractual fees to be awarded to the prime in excess of $500,000 are eligible for graduate M/WBE participation. The prime consultant will receive full M/WBE credit for the use of graduate MWBE's that meet all other requirements. The contract solicited through this RFP is estimated to be valued >over >under $500,000 and therefore, graduate M/WBE's are >eligible >ineligible to participate. It is the proposing firm's responsibility to ensure that graduate M/WBE's are not listed in proposals to meet M/WBE participation requirements on projects in which they are not eligible to participate.

D. The County has established a **credit program** whereby Proposers are awarded credits to be applied toward meeting the M/WBE goals on certain County projects. Emphasis will be placed on credits for non-County utilization and first-time M/WBE utilization. Proposers are encouraged to contact the Business Development Division for information on acquiring and applying the credits.

E. Proposers must submit signed Letter of Intent (Form M-1) with their Proposal for all current Orange County certified M/WBE subconsultants identified on Form B. These Letters of Intent must indicate the scope of work to be performed by every M/WBE plus the percentage of the overall contract fees to be contracted to the listed sub-consultant. Letters of Intent must be signed by both the Proposer and the M/WBE subconsultant.

The Consultant **must i**nclude in the subcontract agreement:

i. Prompt Payment Clause to the M/WBE sub consultant to state: "payment will be made to the sub-consultant/suppliers within 72 hours of receipt of payment from the County."
ii. The following statement: "It is the M/WBE's responsibility to submit the required payment verification reports to the prime consultant quarterly and the Final M/WBE payment verification form directly to Business Development Division."
iii. Termination clause to state: "The awarded prime consultant shall not substitute, replace or terminate any M/WBE firm without prior written authorization from the Business Development Manager, nor shall the prime reduce the scope of work or monetary value of the overall contract value or a sub-consultant without written authorization of the Business Development Division Manager."

The M/WBE's failure to submit the required documents could negatively impact their M/WBE certification.

The awarded prime consultant's responsibilities and requirements are itemized below:

i. File copies of all executed subconsultant agreement/contracts between the prime and all M/WBE subconsultants on the project to Orange County Business Development Division one time for the duration of the contract.

iii. The awarded prime consultant shall furnish written documentation evidencing actual dollars paid to each subconsultant utilized by the prime consultant on the project. This includes, but is not limited to: copies of cancelled checks, approved invoices, and signed affidavits certifying the accuracy of payments so that the County may determine actual participation achieved by the prime consultant prior to the issuance of final payment.

iii. The Prime Consultant shall submit an updated quarterly MWBE utilization report, Equal Opportunity Workforce Schedule and M/WBE payment verification forms for all professional service contracts. It is the responsibility of the Prime Consultant to submit the payment verification forms with the referenced reports. The required reports are to be submitted to the Business Development Division no later than the fifth day after end of reporting period. Payment applications, task authorizations and contract renewals may be delayed if these reports are not submitted every quarter in a timely manner until completion of project indicating final report. Failure of the M/WBE to comply with the submittal of the payment verification forms to the Prime consultant could negatively affect their re-certification.

iv. The awarded prime consultant shall not substitute, replace or terminate any M/WBE firm without prior written authorization from the Business Development Manager, nor shall the prime reduce the scope of work or monetary value of a subconsultant without written authorization of the Business Development Division.

v. The prime consultant shall expeditiously advise all M/WBE's and the Business Development Division of all change orders, contract modifications, additions and deletions to any and all contracts issued to the M/WBE firm on their team.

Execution of the contract between Orange County and the Proposer shall be contingent upon the filing of executed contracts between the Proposer and the M/WBE subs listed on Form B and included on Form M-1 with the Business Development Division.

9. The Proposer understands that this RFP does not constitute an agreement or contract with the Proposer.

10. Any Proposer who submits in its Proposal to the County any information that is determined by the County, in its sole opinion, to be substantially inaccurate, misleading, exaggerated, or incorrect may be disqualified from consideration.

11. **SHORTLISTS, PROTESTS AND LOBBYING:** The recommended short list of firms, rank by score, highest to lowest, will be posted for review by interested parties at the Procurement Division and at http://apps.ocfl.net/OrangeBids/AwardsRec/default.asp prior to submission through the appropriate approval process and will remain for a period of five full business days. Failure to file a protest to the Procurement Division Manager by 5:00 PM on the fifth full business day after the posting date shall constitute a waiver of protest proceedings. Additional information relative to protests can be found at the following site:
http://www.orangecountyfl.net/VendorServices/VendorProtestProcedures.aspx

Orange County Lobbyist Regulations General Information

A lobbying blackout period shall commence upon issuance of the solicitation until the Board selects the successful Proposer. For procurements that do not require Board approval, the blackout period commences upon solicitation issuance and concludes upon Contract award. Additional information relative to lobbying can be found at:
http://www.orangecountyfl.net/OpenGovernment/LobbingAtOrangeCounty.aspx

The Board of County Commissioners may void any Contract where the County Mayor, one or more County Commissioners, or a County staff person has been lobbied in violation of the blackout period restrictions of Ordinance No. 2002-15.

12. **ETHICS COMPLIANCE**

The following forms are included in this solicitation and shall be completed and submitted as indicated below:

a. **Orange County Specific Project Expenditure Report -The purpose of this form is to document any expenses incurred by a lobbyist for the purposes described in Section 2-351, Orange County Code.** This form shall be completed and submitted with any bid, proposal or other response to an Orange County solicitation.

The bidder, proposer or responder to the solicitation shall not be awarded a contract unless this form has been completed and submitted. Any questions concerning this form shall be addressed to the contracting agent identified in the applicable solicitation. Also, a listing of the most frequently asked questions concerning this form is attached for your information.

b. **Relationship Disclosure Form – The purpose of this form is to document any relationships between a bidder, proposer or responder to an Orange County solicitation and the Mayor or any other member of the Orange County Board of County Commissioners.** This form shall be completed and submitted with the applicable bid, proposal or response to an Orange County solicitation. No contract award will be made unless this form has been completed and submitted. Any questions concerning this form shall be addressed to the contracting agent identified in the applicable solicitation.

Also, a listing of the most frequently asked questions concerning this form is attached for your information.

13. Joint venture firms must complete and submit with their Proposal the form titled "Information for Determining Joint Venture Eligibility", (Form K) and a copy of the formal written and executed joint venture agreement between all joint venture parties. This joint venture agreement must be executed and indicate the parties' respective roles, responsibilities and levels of participation for the project. **If proposing as a Joint Venture, the Joint Venture shall obtain and maintain all contractually required insurance in the name of the Joint Venture as required by the Contract**. **Individual insurance in the name of the parties to the Joint venture will not be accepted.** Failure to timely submit a completed Form K along with an attached formal written and executed joint venture agreement may result in disqualification of your Proposal.

14. Conflict/Non-Conflict of Interest and Litigation Statement shall be completed and signed. Additional requested information shall be attached, if applicable.

15. **PUBLIC ENTITY CRIME STATEMENT (FS 287.133)**

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 or Proposal 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 contractor, supplier, subcontractor, subconsultant 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 State Statutes Section 287.017 for CATEGORY TWO for a period of 36 months from the date of being placed on the convicted vendor list.

16. **SUBCONSULTANTS**

Proposers shall list **all** proposed subconsultants to be used, regardless of racial or gender grouping. Include names, addresses, phone numbers, type of work subcontracted (discipline, trade or commodity), proposed percentage of work, and the M/WBE or Majority designation (M/WBE or Non-M/WBE). Form B is provided for this information.

Proposers are expressly prohibited from substituting subconsultants projected to perform five percent (5%) or more of the over-all work as stated in the written Proposal. Such substitution, for any reason, after opening of the Proposal, and prior to award by the County shall result in disqualification of the Proposal from further consideration for award, except in extraordinary circumstances. Examples of such circumstances are the subconsultants' firm going out of business; death of the owner of the firm; or the inability of the subconsultant to perform the work specified. Should such an occurrence arise, it must be substantiated, and the subconsultant substitution approved, by the County prior to contract execution.

Requests for substitution of subconsultants who are cumulatively scheduled to perform less than five percent (5%) of the over-all scope of services may be considered only prior to final scoring of Proposals by the Procurement Committee. Such requests for substitution must be in writing accompanied by a written withdrawal from the originally listed subconsultant. Failure to comply with these requirements shall result in disqualification of the Proposal from further consideration for award. The Procurement Committee shall be the sole determinant regarding acceptance/rejection of requested substitutions.

17. Failure of any Proposer to comply with the INSTRUCTIONS TO PROPOSERS and TERMS AND CONDITIONS of this Request for Proposal, unless specifically identified as a mandatory requirement by the word "shall", may render the Proposal non-responsive and ineligible from further consideration.

18. The Proposer warrants that they have not employed or retained any company or person, other than a bona fide employee working solely for the Proposer, to solicit or secure this Contract and that they have not paid or agreed to pay any person, company, corporation, individual or firm other than a bona fide employee working solely for the Proposer any fee, commission, percentage, gift or any other consideration, contingent upon or resulting from the award of this Contract. For the breach or violation of this provision, the County shall have the right to terminate the Agreement at its sole discretion, without liability and to deduct from the Contract price, or otherwise recover, the full amount of such fee, commission, percentage, gift or consideration.

19. **BONUS POINTS FOR HIRING OF DISLOCATED WORKERS**

Proposers may be awarded a maximum of five (5) bonus points for a commitment to hire dislocated workers residing in Orange County, Florida as full-time employees for the duration of the contract. One point will be awarded for each new full-time hire up to and including a maximum of five (5) points.

To be eligible for bonus points, Proposers must complete Form WR – Section I (attached) listing the number of dislocated workers to be hired full-time and submit with the Proposal. Bonus points shall only be awarded once for any one individual hired. Individuals hired may be employed in any position within the firm but must be hired on a full-time basis.

Within five (5) days after the contract award, the Proposer shall contact the Business Development Division Liaison, at (407) 836-5485 to assist with meeting this requirement.

The failure of the CONSULTANT to comply with these hiring commitments after contract award shall be grounds for termination of the contract for default.

During performance of the contract, the Consultant will take appropriate steps to ensure that individuals hired under this program are retained. However, if it becomes necessary to replace an employee, the Consultant shall contact the Business Development Division (BDD) Liaison. At its discretion, the County may periodically request submission of certified payrolls to confirm the employment status of program participants.

20. **BONUS POINTS FOR HIRING REGISTERED SERVICE-DISABLED VETERANS**

Additional point consideration will be available for those proposing to hire certified registered service-disabled veteran business enterprises. Proposers will receive the following point allocation:

A. Registered service-disabled veteran business enterprise proposers competing as a prime consultant shall receive five (5) points;

B. Registered service-disabled veteran business enterprise proposers with registered service-disabled veteran business enterprise sub-consultants on their team shall receive two points for each sub-consultant up to a maximum of ten (10) points;

C. Proposers with registered service-disabled veteran business enterprise sub-consultants on their team shall receive two points for each sub-consultant up to a maximum of ten (10) points.

D. All SDV firms must be Orange County registered at the time of submittal of the proposal and must be registered in the area(s) for which they will be used. If a firm claims to be registered, but is not listed on the County's website, ocfl.net, the Proposer should obtain a copy of their Orange County registration and/or contact the Business Development Division at 407-836-7317 for verification of registration. Only firms having established offices in the Orlando MSA (Orange, Lake, Seminole and Osceola counties) are eligible for Orange County registration.

E. Proposers shall submit signed Letters of Intent (Form M-2) with their proposal for all current Orange County registered subconsultants identified on Form B These letters of Intent must indicate the scope of work to be performed by every registered SDV plus the percentage of the overall contract fees to be contracted to the listed subcontractor. Letters of Intent must be signed by both the Proposer and the SDV subconsultant.

F. The Consultant's responsibilities and requirements are itemized below:

1. Incorporate a 72-hour prompt payment assurance provision and payment schedule in all contracts between the prime and sub-Consultant.

2. File copies of all executed subcontractor agreement/contracts

between the prime and all SDV subconsultants on the project to Orange County Business Development Division.

3. The Consultant shall furnish written documentation evidencing actual dollars paid to each subconsultant utilized by the prime Consultant on the project. This will include, but not limited to: copies of cancelled checks, approved invoices, and signed affidavits certifying the accuracy of payments so that the County may determine actual participation achieved by the prime Consultant prior to the issuance of final payment.

4. The Consultant shall submit an "Equal Opportunity Workforce Schedule" report for all professional service contracts. The required reports are to be submitted to the Business Development Division no later than the fifth day after end of reporting period.

5. The Consultant shall not substitute, replace or terminate any SDV firm without prior written authorization of the Business Development Division, nor shall the Consultant reduce the scope of work or monetary value of a subconsultant without written authorization of the Business Development Division. The Consultant shall notify the Business Development Division of any additional awards to the SDV firm on the Consultant's team and the addition of any new SDV firm to the Consultant's team on that project.

6. The Consultant shall expeditiously advise all SDV's and the Business Development Division of all change orders, contract modifications, additions and deletions to any and all contracts issued to the SDV firm(s) on their team.

Execution of the contract between Orange County and the Proposer shall be contingent upon the filing of executed contracts between the Proposer and the SDV subs listed on Form B and included on Form M-2 with the Business Development Division.

Proposers are expressly prohibited from substituting subconsultants projected to perform five percent (5%) or more of the overall work as stated in the written Proposal. Such substitution, for any reason, after opening of the Proposal, and prior to award by the County, shall result in disqualification of the Proposal from further consideration for award, except in extraordinary circumstances. Examples of such circumstances are the subconsultants' firm going out of business; death of the owner of the firm; or the inability of the sub-Consultant to perform the work specified. Should such an occurrence arise, it must be substantiated, and the sub- substitution approved, by the County prior to contact execution.

Requests for substitution of subconsultants who are cumulatively scheduled to perform less than five percent (5%) of the over-all scope of services may be considered only prior to final scoring of Proposals by the Procurement Committee. Such requests for substitution must be in writing accompanied by a written withdrawal from the originally listed subconsultant. Failure to comply with these requirements shall result in disqualification of the Proposal from further consideration for award. The Procurement Committee shall be the sole determinant regarding acceptance/rejection of requested substitutions.

The proposer understands that this RFP does not constitute an agreement or contract with the Proposers.

Any Proposers who submits a Proposal to the County with any information that is determined by the County, in its sole opinion, to be substantially inaccurate, misleading, exaggerated, or incorrect may be disqualified from consideration.

When considering two (2) or more proposals, or replies for the procurement of commodities or contractual services, where at least one is from a registered service-disabled veteran business enterprise but which are otherwise equal with respect to all relevant considerations, including price, quality, and service, the Procurement Division Manager shall award such procurement or contract to the registered service-disabled veteran business enterprise.

If a registered SDV, entitled to the vendor preference and one (1) or more other M/WBE businesses also entitled to this preference, or another vendor preference provided by the Orange County Code, submits bids, proposals, or replies for the procurement of goods or services which are otherwise equal with respect to all relevant considerations, including price, quality and service, then the Procurement Division Manager will award the procurement or contract to the business having the smallest net worth.

The Proposer shall contact the Business Development Division Liaison at 407-836-8363 for any questions and/or concerns as it relates to Registered Service-Disabled Veterans.

21. CONTRACT AWARD CRITERIA

The County will award a single contract for this requirement.

22. KEY PERSONNEL

The Project Manager and Project Engineer must be two different individuals. The Project Manager must be currently employed by the Prime Consultant, and both must be a Professional Engineer registered in the State of Florida.

23. REFERENCE CHECKS

The contact person listed as a reference shall be someone who has personal knowledge of the Proposer's performance during the referenced project. Contact

persons must have been informed that they are being used as a reference and that the County may be calling or emailing them. More than one person can be listed but all must have knowledge of the project.

DO NOT list principals or officers who will not be able to answer specific questions regarding the project. Failure of references listed to respond to the County's inquiries may negatively impact the rating of the Proposal. The reference shall be the owner or a representative of the owner. An owner's representative is defined as a firm or individual hired by the owner to oversee the design or construction oversight services performed by the prime consultant. Consultants or Consultants who provided services under the referenced project (contract) shall not be accepted as references unless they were hired as the owner's representative for the referenced project (contract).

24. **VERIFICATION OF EMPLOYMENT STATUS**

Prior to the employment of any person under this contract, the Consultant shall utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the Consultant during the contract term, and an express requirement that Consultant include in such subcontracts the requirement that subconsultants performing work or providing services pursuant to the state contract utilize the E-Verify system to verify the employment eligibility of all new employees hired by the subconsultant during the contract term. For more information on this process, please refer to United States Citizenship and Immigration Service site at:
http://www.uscis.gov/portal/site/uscis.

Only those employees determined eligible to work within the United States shall be employed under this contract.

By submission of a bid in response to this solicitation, the Consultant affirms that all employees in the above categories shall undergo e-verification before placement on this contract. The Consultant shall commit to comply with this requirement by completing the E-Verification certification, attached to this solicitation.

25. **WEIGHTED CRITERIA**

The following criteria and weights shall be utilized in the evaluation of the Proposals:

Criteria	Weight
Similar Projects Completed by the Proposed Project Manager (Form D)	15
Similar Projects Completed by the Proposed Project Engineer (Form E)	10
Skills and Experience of the Project Team	15

(Form F)	
M/WBE Participation (Form B, J, K, M)	15
Location (Form C)	10
Volume of Work Previously Awarded by the County	5
Approach, Understanding, Scope Response (Form H)	30
TOTAL	100

26. **SIMILAR PROJECTS**

"Similar Projects" for the purposes of this Request for Proposals has been defined as:

Project Type A: A new domestic wastewater treatment facility or improvements to an existing domestic wastewater treatment facility resulting in a permitted wastewater treatment capacity increase of 1.5 Million Gallons Per Day (MGD) Annual Average Daily Flow (AADF) or greater. The facility must be located within the state of Florida.

Project Type B: Improvements to an existing domestic wastewater treatment facility located within the 48 contiguous United States of America providing a new wastewater treatment unit process. The capacity of the domestic wastewater treatment facility must be 1.5 MGD AADF or greater. The new unit process does not require an increase in permitted capacity. Acceptable unit processes are screening of raw wastewater, grit removal, activated sludge treatment basin, secondary clarifiers, filters, disinfection and sludge dewatering.

The Project Manager and Project Engineer shall submit no more than three projects **each**.

Each project shall illustrate the following elements have been completed:

1. Preliminary Design Services
2. Final Design Services
3. Permitting Services
4. General Construction Phase Services (Construction must be substantially complete to demonstrate this element).

The following criteria shall apply:

a. For the Project Manager: Element 2 is a mandatory element. The project will receive consideration **for one (1) point** if all **four (4) elements** were successfully completed. The project will receive consideration for **(1/2) half point if three (3) elements** were successfully completed. The project will receive zero (0) points if element No. 2, Final Design Services, is not included. The project will receive zero (0) points if three (3) elements were not successfully completed.

b. For the Project Engineer: Element 2 is a mandatory element. The project will receive consideration for **one (1) point if three (3) elements** were successfully completed. The project will receive consideration for **(1/2) half point** if **two (2) elements** were successfully completed. The project will receive zero (0) points if element No. 2, Final Design Services, is not included. The project will receive zero points if three (3) elements were not successfully completed.

c. The Project Manager and Project Engineer may submit the same projects.

d. To receive credit for the Construction Administration Element (Element 4), projects shall have reached Substantial Completion within the twenty (20) years immediately preceding the advertisement date of this RFP. All other elements must have been successfully completed within twenty five (25) years immediately preceding the advertisement date of this RFP.

e. Substantial completion is defined as the owner having beneficial use of the project. The dates of substantial completion must be prior to the advertisement date of the proposals for this RFP.

f. No more than three (3) "Similar Projects" shall be submitted for evaluation of the proposed Project Manager and the proposed Project Engineer. If more than three (3) Similar Projects are submitted, only the first three (3) listed shall be considered for evaluation. An individual shall be considered the Project Manager of a project only if the individual actually performed the day-to-day management of the project and this is verified by the reference contact of the project provided by the proposer.

g. The proposed Project Manager shall submit at least one (1) Project Type A. Project Type B is not mandatory. A score of zero (0) will be assigned for projects submitted that do meet this requirement.

h. The proposed Project Engineer shall submit at least one (1) Project Type A. Project Type B is not mandatory. A score of zero (0) will be assigned for projects submitted that do meet this requirement.

Definitions:

1. **Project Manager:** Individual who managed the project team and administrative elements of the project, was the primary point of contact for the client, directed the production of the planning/design/construction work products, while performing those services from initial design to substantial completion of the project and is verified by the reference contact of the project provided by the Proposer. The Project Manager shall have been a Professional Engineer registered with the State of Florida Department of Business and Professional Regulation prior to the due date of proposals submitted for this RFP.

2. **Project Engineer:** Individual who assisted the Project Manager as the lead technical supervisor of the project planning/design/construction activities as described in the similar project criteria. The position served as the point of contact for the client in the Project Manager's absence. The Project Engineer shall have been a Professional Engineer registered with the State of Florida Department of Business and Professional Regulation prior to the due date of proposals submitted for this RFP.

3. **Substantial Completion**: is defined as the owner having beneficial use of the project or individual phase if the project was constructed in phases. If the

project was phased, not all phases need to be substantially complete. Only the individual relevant project milestone must have been substantially completed.

4. **Successful Completion**: An experience element is considered successfully completed when the owner takes beneficial use or acceptance of finalized documents.

The proposer shall ensure that the basic description of the similar project, including all required performance requirements and/or dimensions are *identified* and that the elements are adequately explained in the text. The description shall document how the particular element was performed in conjunction with the overall project. The mere listing of elements without specific details in the body of the description will negatively impact the scoring for the project. Failure to identify the specific performance requirements and/or dimensions of the project to ensure it meets the similar project description shall negatively impact that project's score.

Note: Determination of a project as similar shall be at the sole discretion of the County.

27. **EXPERIENCE OF THE PROJECT TEAM**

It is the responsibility of the Proposer to verify sub consultants and/or other team member's satisfactory performance on previous Orange County projects

28. **VOLUME OF WORK**

The county shall evaluate information in its "Volume of Work" database to determine the Proposers' scores for the Volume of Work criteria. This information is available on-line at:
http://www.orangecountyfl.net/VendorServices/VolumeofWorkReport.aspx
This database includes only the award amounts specifically attributable to the consultant, either as a prime or as a sub-consultant or as a member of a joint venture under previously awarded contracts, contract amendments, purchase orders, task authorizations, and change orders to those purchase orders and task authorizations. In the case of mergers between two or more firms or a parent subsidiary relationship the combined fee for all companies involved will be considered. Fees will be counted towards the Volume of Work at the time of award (not invoices paid). Total fees under negotiation are based on the budget amount for professional services. The end date for volume of work calculation is the date set for receipt of proposals.

Volume of Work is calculated using the following formula:

CONTRACT PERIOD	TOTAL FEE AWARDED TO PRIME CONSULTANT		FACTOR		ADJUSTED FEE AMOUNT
(1) From October 1, 2018 to April 1, 2020	$	X	1.0	=	$
(2) First Year Past: 10/01/17- 9/30/18	$	X	0.75	=	$
(3) Second Year Past: 10/01/16-09/30/17	$	X	0.50	=	$
(4) Third Year Past: 10/01/15-09/30/16	$	X	0.25	=	$
(5) Total Fees Under Negotiation	$	X	0.90	=	$
	TOTAL FEE CONSIDERED				$

Proposers are cautioned that they are responsible for confirming the accuracy of their volume of work data prior to the time and date set for receipt of proposals.

Points will be awarded as follows:

Firms with no previous work with the County as a prime consultant or sub-consultant during the current fiscal year and previous fiscal years	**5 Points**
Firms with adjusted fees of $1 through $2,000,000	**4 Points**
Firms with adjusted fees of $2,000,001 through $3,000,000	**3 Points**
Firms with adjusted fees of $3,000,001 through $4,000,000	**2 Points**
Firms with adjusted fees of $4,000,001 through $5,000,000	**1 Point**
Firms with adjusted fees exceeding $5,000,000	**0 Points**

When a Joint Venture submits a proposal, the volume of work awarded by the County to each Joint Venture firm will be multiplied by the percentage of participation in the Joint Venture by that firm and those adjusted figures totaled to determine the total dollar amount to be used in the category.

29. **ORAL PRESENTATIONS**

At this time, oral presentations are not contemplated for this procurement.

30. **PROCEDURES AFTER RECEIPT OF PROPOSALS**

a. Proposals will be evaluated, scored and short-listed by a Procurement Committee based on the weighted criteria described herein.

b. After the Procurement Committee completes its evaluation, the evaluation results and the short-listed firms will be posted at the Public Notice Board at the Procurement Division office, 400 E. South St., Second Floor, Orlando, FL 32801 and at http://apps.ocfl.net/OrangeBids/AwardsRec/default.asp. Upon expiration of the period allowed for protests, the item will be scheduled for the consideration at an upcoming Board of County Commissioners' meeting. If oral presentations are required, the short-listed firms will be notified of the presentation procedures and schedule. If oral presentations are not required, the short-list will be provided to the Board for discussion and approval.

31. **COST AND PRICING DATA**

The County will require the selected Consultant to provide the following documentation to support the negotiated fee Proposal as a condition precedent to the execution of the Contract:

a. A certified audited financial statement for the most recently completed fiscal period, or within the last 12 months, clearly showing the costs (not percentage) of direct labor, indirect labor, fringe benefits, general administrative and overhead costs and a statement of profit or operating margin requested. **A detailed general ledger that is reconciled to the statement of direct labor, indirect labor, fringe benefits, general administrative and overhead costs shall be furnished upon request of the County.**

All indirect costs shall be computed in accordance with 48 CFR Federal Acquisition Regulations.

b. A detailed summary of any transactions between organizations under common control that are included in the indirect costs reported in paragraph "a." above.
c. Raw labor rates by labor classification certified as accurate by an officer of the company.
d. Breakdown of the fee by task/labor classification and raw or billable hourly rate/number of hours.
e. Summary of fees for services to be provided by subconsultants.
f. Scope of work and fee Proposal from each sub supporting the above summary, on the subconsultants' letterhead. The scope of work for each sub must support the scope of work of the prime Consultant's contract.
g. Breakeven multiplier statement from each subconsultant (breakeven multiplier includes direct and indirect labor, general administrative and overhead costs) and the profit or operating margin clearly indicated.
h. Project schedule.
i. Breakdown of all out-of-pocket and/or direct expenses.
j. If any costs for local travel are included, there must be compelling reasons for such costs that must be adequately supported with specific justification.

32. **SUPPORTING DOCUMENTATION**

The County will require the selected Consultant to provide the following documentation to support the negotiated Proposal.

a. Scope of service as revised during contract negotiations. Note that changes should serve to clarify the scope and not add or delete from the scope of work as contained in the Request for Proposals.
b. Billable hourly rates for each proposed sub-consultant developed by multiplying the raw labor rates by the breakeven multiplier. This information must be certified by an officer of the firm. Breakeven multiplier

includes direct and indirect labor, general administrative and overhead costs. The profit or operating margin must be clearly indicated

c. Valid insurance certificate(s) evidencing contractually required coverage.

33. DEBRIEFING OF PROPOSERS

Not later than thirty (30) days after Board approval of a selection or shortlist, a Proposer may submit a written request to the applicable contracting agent for a debriefing on the evaluation of their proposal. The contracting agent will schedule a meeting with the Proposer for the debriefing. However, at the Proposer's request, the debriefing may be conducted via telephone conference. The debriefing shall include the following minimum information:

a. Key requirements of the solicitation.
b. The overall ranking of all proposals. The significant weaknesses or deficiencies in the proposal in response to the requirements of the solicitation.
c. If requested, an explanation of the score received for each evaluation criteria will be provided, including costs, if applicable.
d. If applicable, a summary of the rationale for award.
e. Responses to any relevant questions of the proposer.

Untimely debriefing requests will also be considered.

34. PROPRIETARY INFORMATION

In accordance with Chapter 119 of the Florida Statutes (Public Records Law), and except as may be provided by other applicable State or Federal Law, all proposers should be aware that formal solicitations and the responses thereto are in the public domain. Requests for confidential treatment will not supersede the County's legal obligation to provide records to the public consistent with public records law. Proposers must cite specific, applicable legal grounds to support a request for confidential treatment, of any portion of a proposal. Requests by proposers to keep entire proposals confidential are generally not supported by public records laws. At a minimum, the County will disclose the successful proposer's name, the substance of the bid/proposal, and the price.

If the proposer requests confidential treatment, bidder/proposer must submit an additional copy of the proposal with the proposed confidential information redacted. This copy must include a general description of the information redacted, and shall only be redacted in the least expansive manner necessary to effectuate the requested exemption(s). In a separate attachment, proposer shall supply a listing of the provisions identified by section number for which it seeks confidential treatment and identify the statutory basis under Florida law, including a detailed justification for exempting the information from public disclosure.

Proposer shall hold harmless and indemnify the County for all claims, actions, suits, judgments, fines, costs or damages the County may incur as a result of

proposer's request for confidential treatment of its proposal. Proposer agrees and understands that the County may make copies of, and distribute, the proposal without any requested redactions, to facilitate evaluation. Proposer warrants that such copying will not violate the rights of any third party.

35. **DEVELOPMENT OR ASSISTANCE IN DEVELOPMENT OF SPECIFICATIONS/REQUIREMENTS/STATEMENTS OF WORK**

Firms and/or individuals that assisted in the development or drafting of the specifications, requirements, statements of work, or solicitation documents contained herein are excluded from competing for this solicitation.

This shall not be applicable to firms and/or individuals providing responses to a publicly posted Request for Information (RFI) associated with a solicitation.

Scope of Work
Southwest Water Reclamation Facility Construction

PROJECT DESCRIPTION

The County will select one consultant under this solicitation to perform engineering services for the Hamlin Water Reclamation Facility (HWRF) Phase II Construction. The project involves the construction of an expansion to HWRF that will increase the capacity from 5.0 million gallons per day (MGD) annual average daily flow (AADF) to 10 MGD AADF. Anticipated improvements include construction of new facilities such as screening, grit removal, aeration basins, secondary clarification, sludge pumping, tertiary filtration, disinfection, effluent pumping and storage, solids handling, biosolids treatment, instrumentation and controls, buildings, odor control, stormwater management systems, roadways, effluent disposal systems, rapid infiltration basins, wetland systems, power generation, energy recovery, energy conservation improvements, force mains, reclaimed water mains and any other facility improvements required. The Southwest (now known as Hamlin) Water Reclamation Facility Preliminary Engineering Report dated October 2015 is attached.

The specific assignments to be performed by the Consultant under this solicitation shall include the following elements:

- Refine project goals and objectives with assistance from Orange County Utilities (OCU) and from other OCU consultants.
- Develop construction documents for all proposed improvements.
- Prepare and submit permits.
- Provide bidding and construction services.
- Prepare electronic operations and maintenance (O&M) manuals.
- Provide all additional engineering and consulting services related to the implementation of the project including but not limited to survey, geotechnical, environmental, value engineering, security, energy evaluations, energy recovery, alternative evaluations, hurricane protection, site security and architectural elements.

BACKGROUND

The HWRF will be an advanced wastewater treatment (AWT) facility located in the Horizons West area with multiple biological treatment trains and an initial total permitted capacity of 5.0 MGD AADF. Two additional treatment trains of 2.5 MGD each will be constructed. The flow can split two ways downstream of the grit removal units, where treatment continues via anoxic/aeration activated sludge processes, clarification, filtration and disinfection through chlorination. Effluent will be reused in the local OCU reclaimed water service area and at Water Conserv II. The effluent limits will remain at 5:5:3:1.

Waste activated sludge from all trains will be dewatered. The dewatered cake will be transported by a third party contractor to SWRF where it will be further treated in Phase I. Centrifuges have been contemplated for the Phase II project. The selected Consultant shall provide recommendations to the County as to the specific method of dewatering and disposal during the preliminary design process.

SCOPE OF PROFESSIONAL SERVICES

Services that may be required for this project are outlined in the following paragraphs.

1.0 Preliminary Design

A. Conduct workshops with OCU to further define project requirements.

B. Provide supplemental data and services, as needed, in support of the project including modeling, geotechnical, surveying, environmental assessment and testing services, energy conservation/recovery analyses, hurricane protection evaluation, security assessments, fuel tank coordination, architectural considerations, site, roadway, stormwater and drainage improvements, and other specialty engineering services, as needed.

C. Review the layout proposed for the facility, operational data, studies, reports, agreements, and drawings pertaining to the project(s).

D. Conduct pilot testing, operational testing, laboratory and full-scale testing, and computer modeling as needed to evaluate new facilities and determine feasibility of proposed construction.

E. Coordinate with other municipalities, consultants, and regulatory agencies.

F. Prepare a draft preliminary design report consisting of written descriptions of the project, design criteria, preliminary drawings, site layouts, outline of equipment to be specified, probable total project costs, project schedules, construction phasing, and operational issues during construction. Incorporate OCU comments into the final preliminary design document.

2.0 Final Design and Permitting

A. Complete construction drawings that result in a functional, operable facility in accordance with the requirements of applicable codes, standards and requirements of all agencies having jurisdiction over the project.

B. Provide right-of-way maps, easements, and legal descriptions for all land acquisitions.

C. Conduct and document engineering evaluations of construction materials, construction methods, and selection of equipment.

D. Prepare geotechnical reports and provide supplemental reports and studies to more closely define the conditions for the construction of future facilities.

E. Submit construction drawings to OCU at 60%, 90%, and 100% levels. After OCU review of each submittal, the Consultant shall meet with OCU. The Consultant shall document all review comments before proceeding to the next completion level.

F. Prepare all documents, design calculations, plans, maps, drawings, specifications and applications required or needed to obtain the approval of all permits required for construction and operation of the facilities. Prepare plans and specifications for public

bidding of the project. Coordinate with the Orange County Procurement Department and OCU to incorporate front-end documents into the bid set.

G. Submit a detailed construction cost estimate, signed and sealed, based on approved construction drawings and technical specifications.

H. Assist OCU in the implementation of value engineering.

I. Prepare public notices as required and participate in public presentations regarding the projects.

J. Assist with OCU with permitting, including, but not limited to FDEP permitting, Orange County Building Department permitting and ecological permitting.

3.0 Bidding Services

A. Coordinate the award of the construction project, including, but not limited to preparation of bid documents and addenda in accordance with County requirements. One or more construction contracts are anticipated.

B. Attend pre-bid conference, prepare meeting minutes and answer bidder questions.

C. Evaluate bids, prepare recommendation of award and produce conformed documents.

4.0 Construction Services

A. Consultant shall provide general engineering services during construction.

B. Conduct pre-construction meetings with the Contractors, owner and other affected parties prior to beginning construction. Provide agenda, pre-construction booklet, and minutes of the meeting. Prepare and distribute conformed contract documents to all parties.

C. Consultant may be requested to provide a full-time resident project representative (RPR) and assistant to perform site inspections, certify work, inspect deliveries, conduct monthly progress meetings, and prepare meeting minutes.

D. Review shop drawings, submittals, material samples, laboratory samples, shop reports, and test reports submitted by the Contractor for compliance with the design requirements and recommended acceptance or denial to OCU.

E. Review contract change orders. Provide technical assistance in claims negotiations and dispute resolution.

F. Evaluate requests for use of substitute materials and equipment proposed by the Contractor.

G. Provide clarifications and interpretations of the contract documents.

H. Make recommendations to resolve field conflicts encountered during construction.

I. Attend monthly progress meetings with the Contractor and OCU and provide minutes of

the meetings.

J. Review and monitor Contractor's construction schedule and advise OCU as to progress and problems affecting such progress.

K. Observe and review results of performance and other tests and inspections executed, as required by the contract, by the Contractor and provide written opinions to the County's representative.

L. Collect and verify all as-built information from field representatives and Contractor as needed to prepare record drawings. Provide signed and sealed hard copies, reproducible copies, and electronic copies of the record drawings to OCU in an electronic format acceptable to OCU.

M. Conduct substantial and final inspections of completed facilities. Provide OCU with a punch list of outstanding items.

N. Provide project certifications to all regulatory agencies.

O. Assist OCU as needed to ensure successful completion of the project.

P. Work within the Contract Manager or eBuilder software environment for the entire length of construction.

5.0 Operations Manual and Plant Start-Up

A. Provide electronic operations and maintenance manuals in accordance with County standards, including, but not limited to, manufacturer's information, warranties, certificates, spare parts, and other documentation necessary to start, operate, and maintain the facility.

B. Develop a detailed start-up plan. Coordinate all start-up activities including manufacturer services and training. Provide a complete set of records that meet OCU requirements for the project including spare parts, warranties, and approvals needed for operation.

ARCADIS Design & Consultancy for natural and built assets

ORANGE COUNTY UTILITIES

PRELIMINARY ENGINEERING REPORT

Hamlin Reclamation Facility Phase 1

April 2019

In collaboration with:

Alliance Design and Construction

Antillian Engineering Associates

Barnes, Ferland and Associates

Electrical Design Associates

EPIC Engineering and Consulting Group

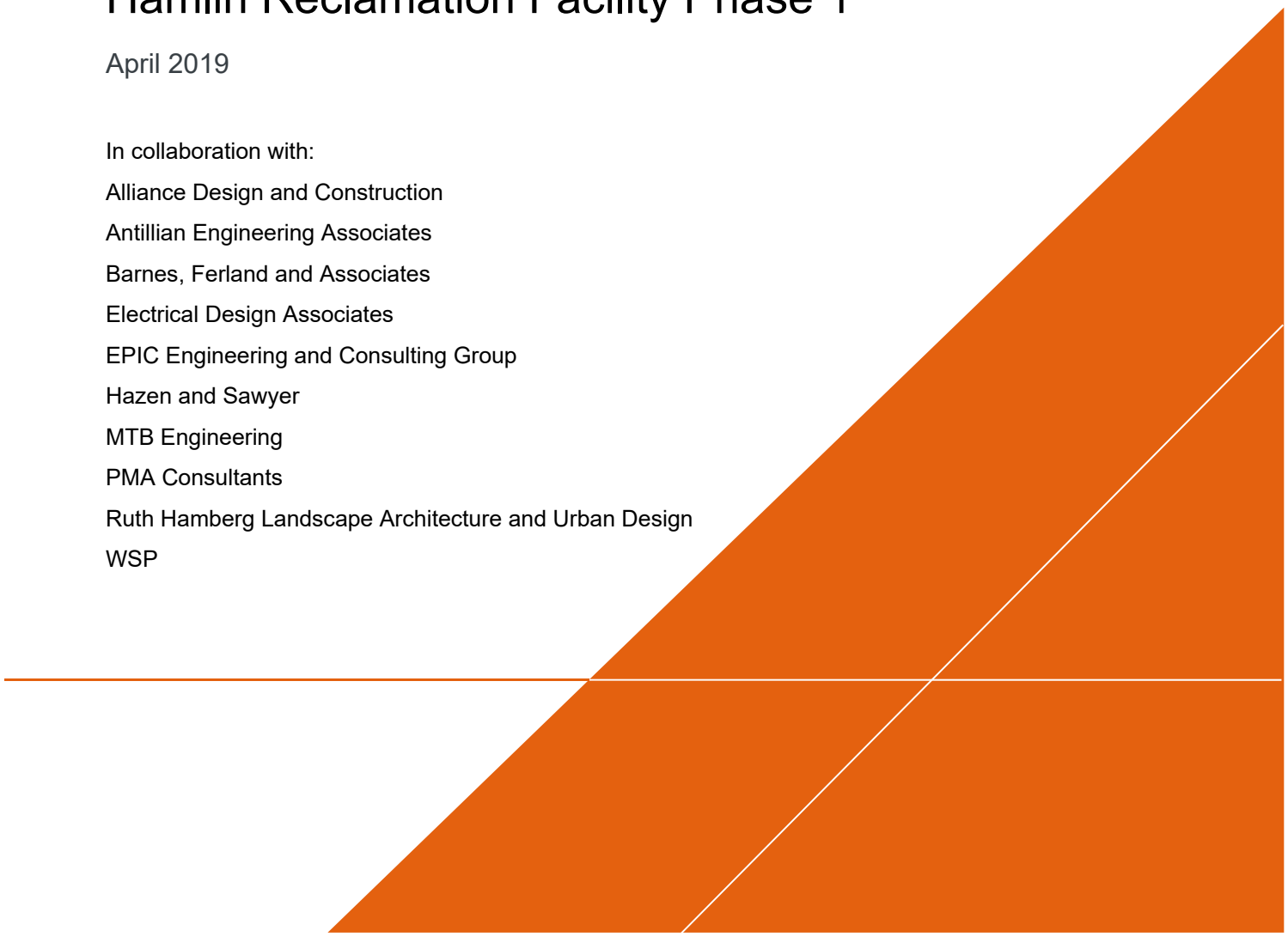
Hazen and Sawyer

MTB Engineering

PMA Consultants

Ruth Hamberg Landscape Architecture and Urban Design

WSP



PRELIMINARY ENGINEERING REPORT

Hamlin Reclamation Facility Phase 1

Prepared for:

Orange County Utilities

Ifetayo Venner
Vice President

Prepared by:

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Our Ref.:

09001007.0000

Date:

April 2019

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APPENDICES

ACRONYMS AND ABBREVIATIONS

AC	Alternating Current
AER	Aerobic
AADF	Annual Average Daily Flow
AABC	Associated Air Balance Council
ACFM	Actual Cubic Feet Per Minute
ach	Air changes per hour
ACI	American Concrete Institute
Al	Aluminum
ACGIH	American Conference of Governmental Industrial Hygienists
AISC	American Institute of Steel Construction
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute
ASHRAE	American Society of Heating, Refrigeration, and Air Conditioning Engineers
ASCE	American Society of Civil Engineers
ASTM	American Society of Testing and Materials
BFP	Belt Filter Press
BNR	Biological Nutrient Removal
cBOD	Carbonaceous Biochemical Oxygen Demand
$cBOD_5$	Carbonaceous Biochemical Oxygen Demand, 5 Day
CISPI	Cast Iron Soil Pipe Institute
CCT	Chlorine Contact Tank
CTM	Closed Transition Mode
CT	Contact Time
CF	Cubic Feet
CFD	Computation Fluid Dynamics
cfm	Cubic Feet per Minute
COD	Chemical Oxygen Demand
CPVC	Chlorinated Polyvinyl Chloride
CMU	Concrete Masonry Unit

ºC	Degrees Celsius
ºF	Degrees Fahrenheit
DC	Direct Current
DO	Dissolved Oxygen
D/T	Dilutions to threshold
DWV	Drain Waste Vent
EO	Electrically Operated
EBPR	Enhanced Biological Phosphorus Removal
EPA	Environmental Protection Agency
EPDM	Ethylene Propylene Diene Monomer
EPR	Ethylene Propylene Rubber
EWRF	Eastern Water Reclamation Facility
FRP	Fiber Reinforced Polyester
F.A.C.	Florida Administrative Code
FBC	Florida Building Code
FBCEC	Florida Building Code Energy Conservation
FDEP	Florida Department of Environmental Protection
FEMA	Federal Emergency Management Agency
FLAC	Florida Accessibility Code
FWC	Florida Fish and Wildlife Conservation Commission
ft	Foot
gal	Gallon
GBT	Gravity Belt Thickener
gpd	Gallons per Day
gph	Gallons per Hour
gpm	Gallons per Minute
GST	Grounds Storage Tank
HDPE	High Density Polyethylene
Hertz	Hz
HMI	Human Machine Interface
H_2S	Hydrogen Sulfide

HP	Horsepower
HVAC	Heating, Ventilation, and Air Conditioning
I/O	Inputs/Outputs
IBC	Intermediate Bulk Containers
IEEE	Institute of Electrical and Electronic Engineers
IGBT	Insulated Gate Bipolar Transistor
kV	Kilovolt
kW	Kilowatt
lb	Pound
lb/hr	Pounds per Hour
LEED	Leadership in Energy and Environmental Design
LED	Light Emitting Diode
LF	Linear Feet
LLDPE	Linear Low-Density Polyethylene
MDF	Maximum Daily Flow
MERV	Minimum Efficiency Reporting Value
MG	Million Gallons
MGD	Million Gallons per Day
mL	Milliliter
mg/L	Milligrams per Liter
MLSS	Mixed Liquor Suspended Solids
mm	Millimeter
MMF	Maximum Monthly Flow
mph	Miles per Hour
MCC	Motor Control Center
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NPDES	National Pollutant Discharge Elimination System
NPW	Net Present Worth
NRCY	Nitrified Recycle

NAD	North American Datum
NAVD	North American Vertical Datum
NSA	Northwest Service Area
NWRF	Northwest Water Reclamation Facility
OTM	Open Transition Mode
O&M	Operations and Maintenance
OCPD	Orange County Planning Division
OCU	Orange County Utilities
P	Phosphorus
PAR	Public Access Reuse
PC	Personal Computer
PEMB	Pre-engineered Metal Building
PER	Preliminary Engineering Report
PHF	Peak Hourly Flow
PICS	Process Instrumentation and Control System
PID	Proportional-Integral-Derivative
PLC	Programmable Logic Controller
ppd	Pounds per Day
ppm	Parts per Million
psf	Pounds per Square Foot
psi	Pounds per Square Inch
psig	Pounds per Square Inch - Gage
PVC	Polyvinyl Chloride
PVF	Polyvinyl Fluoride
PS	Product Standard
PWM	Pulse Width-Modulated
RAS	Return Activated Sludge
Reaer	Reaeration
RIB	Rapid Infiltration Basins
RSC	Reduced Sulphur compound
SCADA	Supervisory Control and Data Acquisition

SCFM	Standard Cubic Feet per Minute
SCR	Silicon-Controlled Rectifier
SCS	Soil Conservation Service
SF	Square foot
SHT	Sludge Holding Tank
SLR	Solids Loading Rate
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SOR	Surface Overflow Rate
SPD	Surge Protection Devices
SR	State Road
s.s.	Stainless Steel
SS	Suspended Solids
SSA	South Service Area
SU	Standard Units
SFWMD	South Florida Water Management District
SWG	Swing
SWRF	South Water Reclamation Facility
SWSA	Southwest Service Area
HWRF	Southwest Water Reclamation Facility
TDH	Total Dynamic Head
THD	Total Harmonic Distortion
TKN	Total Kjeldahl Nitrogen
TM	Technical Memorandum
TN	Total Nitrogen
TP	Total Phosphorus
TRC	Total Residual Chlorine
TS	Total Solids
TSS	Total Suspended Solids
UL	Underwriters Laboratories
UPS	Uninterruptible Power Supplies
USDA	United States Department of Agriculture

V	Volt
VFD	Variable Frequency Drive
VOC	Volatile Organic Compound
VSS	Volatile Suspended Solids
WAS	Waste Activated Sludge
W.C.	Water Column
WCII	Water Conserv II
WRF	Water Reclamation Facility
WQTV	Water Quality Treatment Volume
XLHDPE	Cross-linked High Density Polyethylene

EXECUTIVE SUMMARY

Background

OCU is proposing to construct a new HWRF to treat an initial total permitted capacity of 5.0 MGD AADF. The site is located in the southwest section of Orange County on a parcel of land within the area known as RIB Site 6 within the WCII RIB disposal system.

The initial phase (Phase 1) of the construction is expected to be 5.0 MGD AADF. This will be followed by two additional phases: Phase 2 where the HWRF will be expanded to 10.0 MGD AADF and Phase 3 where the HWRF will be expanded to an ultimate build-out capacity of 15.0 MGD AADF. The site is master planned to allow for this expansion.

The HWRF will include the following major processes:

Preliminary Treatment

In Phase 1, two hydraulically cleaned mechanical band screens will be installed; each with a maximum capacity of 15 MGD. A bypass channel with a manually cleaned screen will also be provided for emergency purposes. Screenings removed from the influent wastewater will be discharged from the top of the screen and conveyed to a washer-compactor for removal of organics and compaction prior to discharge to a dumpster. In Phase 2, no additional screens will be added. In Phase 3, an additional channel with one mechanical band screen with a maximum capacity of 15 MGD will be added.

In Phase 1, two Headcell™ grit removal units will be provided at the HWRF. Each of the expandable Headcell™ grit removal units will be fitted with eight 12-feet diameter trays with provisions for expanding the units to hold twelve 12-feet diameter trays in subsequent phases. A bypass of the grit removal system will be provided. Settled grit will be pumped from the underflow collection chamber to the grit washer/classifier unit. In Phase 2, the two existing Headcell™ grit removal units and bypass (installed in Phase 1) will accommodate the Phase 2 PHF of 30 MGD with Class 1 reliability. In Phase 3, four additional trays will be installed in each of the Headcell™ grit removal units to increase the capacity of each unit from 15 MGD to 22.5 MGD, respectively. The modifications will accommodate the Phase 3 PHF of 45 MGD.

The odor control system will consist of a biotrickling filter followed by a polishing stage of activated carbon in a dual-stage odor control unit.

Biological Nutrient Removal

Biological nutrient removal will be acocmplished by a 5-Stage Bardenpho process with provisions for supplemental carbon and metal salt addition. Two, parallel 2.5 MGD AADF Activated Sludge Treatment Trains will be constructed during Phase 1. Four additional trains will be added in both Phases 2 and 3, for a total of 6 to reach the ultimate build-out capacity of 15 MGD AADF. The Activated Sludge Tratment Train system will consist of anaerobic, anaerobic/anoxic swing, first anoxic, 1st anoxic/aerobic swing, aerobic, aerobic/2nd anoxic swing, 2nd anoxic, and reaeration zones.

Aeration in aerobic, 1st anoxic/aerobic, and reaeration zones will be provided through fine bubble porous membrane disc diffusers. Mechanical "non-ragging" mixers will be provided in all zones without aeration (anaerobic, anoxic, and swing zones) in order to maintain the mixed liquor solids in suspension.

Process air blowers will be used to supply air to the diffusers in the activated sludge treatment trains. OCU has elected to install multistage centrifugal blowers similar to those being installed at the EWRF and existing at SWR. In Phase 1, three small (150 HP) blowers, one medium (300 HP) blower, and one large (700 HP) blower will be installed. The blowers will be constant speed with inlet valve control to cover the entire range of flow rates. One additional large blower will be added at Phase 2 and again at Phase 3 for an ultimate total of three small blowers, one medium blower, and three large blowers. At the maximum day flow at Phase 3, a large blower can be taken out of service and the three small blowers, one medium blower and two large blowers will be able to meet air flow requirements.

Nitrified mixed liquor from the end of the aerobic (or aerobic/2nd anoxic swing) zones is pumped to the first anoxic zone. There carbon from the influent wastewater is utilized to convert nitrates produced in the aerobic zone to nitrogen gas in the anoxic zone. The NRCY/IR pump station will be located outside of the activated sludge treatment trains. Each treatment train will have an external duplex pump station and metering station. The metering station will allow for increased control and monitoring of the NRCY flow. End-suction horizontal non-clog pumps with VFDs are the proposed type of pump to be used in the pump station.

Clarifiers

Three 100-foot diameter clarifiers will be constructed in Phase 1. One additional clarifier will be constructed in Phase 2 and two additional will be constructed in Phase 3, for a total of 6 clarifiers at build-out. Each clarifier will also include an a spiral blade mechanism (center-drive), energy dissipating inlet, density current baffle and sludge blanket level monitoring. A weir cleaning system will also be added.

A single, double disc, positive displacement pump will collect scum from the from the clarifier surface, with each clarifier having a dedicated scum pump. Scum will be sent to the solids holding tanks.

RAS/WAS Pump Station

Settled sludge from the secondary clarifiers will be pumped as RAS to the effluent end of the pre-treatment structure or as WAS to the SHTs. Non-clog centrifugal type units will be installed. Sludge will be withdrawn directly from each clarifier. Three RAS pumps will be provided for each pair of clarifiers, with two operating (one per clarifier) and one common stand-by. For the WAS pump, two units will be provided for each pair of clarifiers with one operating and one stand-by.

Tertiary Filters

Disk filters will be installed downstream of the secondary clarifiers for additional removal of solids prior to chlorination. Filters will be stand-alone enclosed units supplied by the manufacturer. The filter structure will be sized to accommodate the number of filters required for Phase 1 and Phase 2. In Phase 3, an additional structure would be built adjacent to this structure to accommodate the final number of units for full capacity build out. Number of filters (and discs per filter) will vary depending on the manufacturer.

Three units will be provided for all three approved manufacturers in Phase 1. A total of 4-5 filters will be installed at Phase 2 and a total of 7-9 will be installed at buildout in Phase 3.

High Level Disinfection

Effluent from the filters is discharged by gravity to the CCTs for high-level disinfection. The design for the CCTs and hypochlorite feed system will be based on the assumption that the reclaimed water or effluent will contain between 1,000 and 10,000 fecal coliforms per 100 mL, which requires a CT value of at least 40. With a design CT value of 40, the CCTs will require 2.0 mg/L free chlorine residual at PHF with a minimum of 20-minute contact time. At lower flows, the contact time will increase, allowing the required free chlorine residual to be reduced. Nevertheless, a minimum 1.0 mg/L free chlorine residual will be maintained at all times.

The CCTs will be sized to provide sufficient contact volume to treat the PHF with all units online. One CCT will be provided for Phase 1. The CCT will be divided in to two basins to allow for one basin being taken out of service. Each basin will have 3 passes. One similar CCT will be provided during each of the expansions in Phase 2 and Phase 3, respectively, for a total of three CCTs at ultimate Phase 3 build out.

Reject Pond and Return Pump Station

Effluent from HWRF will be used for PAR in the SWSA. The SWSA PAR system will interconnect with the WCII PAR system. Excess reclaimed will be transferred directly to the WCII transmission main and to the RIB Site 6 system. The RIB Site 6 system also services as a secondary location for non-PAR effluent. Although reject storage is not required, for increased operational flexibility, a 5 MG lined reject pond will be constructed. Effluent not meeting PAR standards will be first directed to the reject pond for storage and eventual pumping via a reject return pump station to the pre-treatment structure, downstream of grit removal, for retreatment. Should the reject pond be full or otherwise unavailable flow will be discharged to a dedicated subsection of RIB Site 6. Additional reject storage capacity for future phases can be accommodated west of the GSTs in the form of storage tanks. Diversion to the reject pond will be automatic upstream of the filters based on TSS concentration and downstream of the CCTs based on chlorine residual. The pump station will contain 3, submersible end suction centrifugal pumps.

Effluent Disposal and Reuse

Low-lift vertical pumps will be provided at the end of the CCTs to lift chlorinated water to the GSTs located on the western side of the HWRF site. One, 5 MG GST will be installed in Phase 1 and an additional tank will be added at each phase (Phase 2 and 3) through buildout.

At Phase 1, the pump station will be designed for three, 150 HP pumps (2 duty/ 1 standby). For Phases 2 and 3, two additional 150 HP pumps will be added at each phase.

Reclaimed Water Storage and Reclaimed Water/Non-PAR High Service Pump Station

The HWRF Reclaimed Water/Non-PAR High Service Pump Station will be designed to pump reclaimed water into the SWSA PAR system or the WCII RIB Site 6 system. HWRF reclaimed water would be delivered directly to the western portion of the OCU SWSA for PAR irrigation. Excess wet weather flow and flow not meeting PAR requirements will be pumped from the Reclaimed Water/Non-PAR High Service Pump Station to the RIBs rather than to the PAR systems. The pressure requirement will be variable, but it is anticipated that it could be as high as the 100 psi range. Because this pressure requirement is expected to be similar for both, the same pumps will be used with a control valve system.

The reclaimed water pumps will be vertical turbine pumps with VFDs which will provide flexibility to handle the pressure variations associated with the different RIB connection points and lower flows. For Phase 1, five pumps will be installed: two 250 HP pumps and three (2 duty 1 standby) 500 HP pumps. The firm capacity will be 30 MGD. The two 250 HP pumps will allow for turn down during the low flow conditions at startup and will eventually be replaced with larger pumps. For Phases 2 and 3, a duplicate of this pump station will be built, with ten 500 HP pumps installed at the ultimate Phase 3 build out.

Chemical Feed Systems

Sodium Hypochlorite

Sodium hypochlorite will be provided for high level disinfection based on a target of the product of total chlorine residual and the contact time at PHF being at least 40 mg-min/. Sodium hypochlorite metering will be designed around using a duplex pump skid with dedicated duty pumps for each CCT with a swing stand-by pump for maintenance. The feed pumps will be hydraulically actuated diaphragm metering pumps and designed to provide a dose of 14 mg/L to the CCTs during PHF.

For Phases 1 and 2, two 3000-gallon storage tanks will be provided. The building will be designed to ultimately house three, 6100-gallon storage tanks, and the tank structural pedestals will be designed for larger future tanks. The sodium hypochlorite will be fed to the two mixing zones at the head of the two chambers. Secondary feed points will be the RAS or the filter influent.

Alum

Phosphorus removal can be achieved by chemical precipitation or by EBPR. EBPR is expected to be the primary phosphorus removal mechanism and modelling indicated that targeted effluent phosphorus concentrations could be achieved by EBPR alone. However, since this is a new facility where the influent quality has been estimated based on sampling at other OCU facilities and to provide supplemental phosphorus removal in the event of a disruption to the EBPR process, a backup system of chemical precipitation is recommended. Alum is recommended for use at the HWRF and will be introduced upstream of the clarifiers. In accordance with PAR rule 62-610.460, which requires chemical feed facilities for coagulant, coagulant aids, or polyelectrolytes to enhance pathogen removal at the filters, alum will also be introduced prior to the filters; this will also serve as a back-up feed location for chemical removal of phosphorus.

Due to the unknowns related to the construction of a new WRF such as influent quality and basin performance, the alum metering and storage system will be implemented in phases. The start-up phase will consist of slab on grade with metering skids and IBCs mounted on top of polyethylene secondary containment spill pallets. Once the facility is in operation, chemical needs for supplemental phosphorus removal will be reassessed and a more permanent structure with storage tanks will be installed, if necessary, based on updated design criteria. Space has been allocated on site for such a facility.

Carbon

Based on the results of the treatment process modeling using BioWin™, supplemental carbon is recommended for the HWRF to meet the effluent total nitrogen permit requirements. A supplemental carbon (MicroC™ 2000) feed system consists of product storage and chemical metering skids for pumping the product to the final post anoxic zones as a food source for denitrifying bacteria.

The supplemental carbon metering and storage system will be implemented in phases. The start-up phase will consist of slab on grade with metering skids and IBCs mounted on top of polyethylene secondary containment spill pallets. Once the facility is in operation and denitrification performance can be evaluated, carbon needs for will be reassessed and a more permanent structure with storage tanks will be installed, if necessary, based on updated design criteria. Space has been allocated on site for such a facility.

Sludge Holding Tanks

For Phase 1, OCU intends to thicken solids at the HWRF and transport to SWRF for additional processing. As flows to the WRF increase in future phases, OCU anticipates dewatering solids on site and space has been allocated for a future dewatering building. Four SHTs are proposed in Phase 1: two SHTs for WAS storage prior to thickening and two for thickened sludge storage post gravity belt thickening and prior to truck loading and disposal. All SHTs will have the ability to store WAS. As OCU moves to dewatering of sludge in future phases, there will no longer be a need for thickened sludge storage and all four SHTs would be used for WAS storage. At buildout capacity in Phase 3, there will be 6 SHTs for WAS storage.

The SHTs will be above ground concrete structures with an engineered cover system and activated carbon adsorber single stage odor control system to mitigate potential odors which may impact nearby recreational facilities. The four SHTs will be rectangular with common wall construction. Each storage tank will be 90-feet long by 40-feet wide with a side water depth of 12 feet. Aeration and mixing for the tanks will be provided by wide band coarse bubble diffusers and positive displacement blowers. Six blowers will be provided per pair of tanks. The SHTs will be provided with the option to decant sludge to thicken.

Thickening

Sludge from the WAS SHTs will be pumped to a thickening facility to be thickened via gravity belt thickeners and sent by truck to the SWRF for additional processing and eventual disposal. GBTs were selected as they are used for thickening at other OCU WRFs. As flows to the WRF increase in future phases, OCU anticipates dewatering solids on site and there will no longer be a need for the GBTs.

Therefore, the GBTs are sized to accommodate Phase 1 only. Thickened sludge will be pumped to the thickened sludge SHTs and from pumped to a truck for transport to SWRF.

Two, 3 meter, 350 gpm GBTs (one duty and one standby) will be provided. The GBTs were sized to limit operations to one shift per day during the week. Each GBT has a feed pump, hydraulic drive and washwater booster pump, polymer activation metering unit and polymer storage, and thickened sludge pump.

1 INTRODUCTION

1.1 Background

OCU is proposing to construct a new HWRF to treat an initial total permitted capacity of 5.0 MGD AADF. The site is located in the southwest section of Orange County on a parcel of land within the area known as RIB Site 6 within the WCII RIB disposal system.

The initial phase (Phase 1) of the construction is expected to be 5.0 MGD AADF. This will be followed by two additional phases: Phase 2 where the HWRF will be expanded to 10.0 MGD AADF and Phase 3 where the HWRF will be expanded to an ultimate build-out capacity of 15.0 MGD AADF. As part of this project, the site is being master planned to allow for this expansion. The initial HWRF is expected to include the following major processes and structures:

- Approximately 3,600 lf of 36 inch influent force main in to the WRF
- Preliminary treatment in a pretreatment structure with screening and grit removal, as well as odor control
- BNR with activated sludge basins with diffused aeration
- Blower building with a process air blower system
- Secondary clarifiers and scum collection and pumping system
- RAS and WAS pumping system
- Tertiary filtration
- CCTs
- Effluent transfer pump station
- Reclaimed water storage and pumping system
- Plant drain pump station
- Reject pond and reject return pump station
- Chemical feed systems including alum, carbon, and sodium hypochlorite
- SHTs with odor control
- GBTs
- Administration and maintenance buildings
- Electrical and support buildings
- Electrical equipment and emergency power generator with fuel storage system

Effluent from the WRF will be discharged to the Orange County SWSA Reuse System and/or the Water Conserv II RIB Site 6 system. There is sufficient capacity in the reuse system to accommodate flows form HWRF.

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1.2 Purpose

The purpose of the PER is to summarize the processes and equipment selected, as well as the process design criteria for a Phase 1 design flow of 5 MGD AADF. Future expansions to 10 MGD AADF in Phase 2 and 15 MGD AADF in Phase 3 were also considered during design and development of the site layout.

The PER was initially issued in 2015 and the project was placed on hold as flows in the service area were treated by another utility under and agreement with OCU. Several TMs were prepared during the development of the preliminary design. These are included in Appendix C and are as follows:

TM No. 1 – Influent Wastewater Sampling Plan

TM No. 2 – Environmental Investigation Site Findings

TM No. 3 – Influent Wastewater Characteristics - wastewater characterization including summary of special sampling events and proposed design parameters

TM No. 4 – Reclaimed Water Management Analysis – analysis of wet weather and substandard flow storage

TM No. 5 – Biological Process Alternatives – Alternatives analysis of the Five Stage Bardenpho and Step Feed processes. Selection of the Five Stage Bardenpho process

TM No. 6 – Operations Building and Standard Site Architecture

TM No 7 – Major Process Components

TM No 8 – Site Master Plan

In August 2017, the design for Phase 1 was restarted. The PER was updated to reflect additional unit process incorporated in Phase 1, as well as substantive changes to the design since 2015. Among the substantive process changes was the addition of a reject pond and the delay of a dewatering facility until future phases; sludge will instead be thickened via GBT thickening and trucked to SWRF for further processing and eventual disposal.

Note: The name of the facility was changed from Southwest Water Reclamation Facility to Hamlin Water Reclamation Facility towards the end of the design of Phase 1. Therefore, some older documents developed and finalized prior to this stage may refer to Southwest Water Reclamation Facility, abbreviated as SWWRF.

1.3 Site Description

1.3.1 Location

The HWRF will be located on a 50 acre site within WCII RIB Site 6 at the intersection of Malcolm Road and Mann Road east of State Road 429 in southwest Orange County (Latitude 28°29'12"N, Longitude 81°37'27"W). Refer to Figure 1 for a location map.

1.3.2 Survey / Datum

Refer to Figure 2 for a topographic survey. Horizontal datum shall be Florida State Plane, NAD 83/90, and tied into the Orange County datum. Vertical datum is based on NAVD 88 as derived from Orange County as derived from Orange County benchmark #L-1444-073.

1.3.3 Flood Level

The future location of the HWRF is not located within the 100-year flood zone per FEMA Flood Insurance Rate Maps No. 12095C0375F and 12095C0380F dated 09/25/2009. The site is located in Zone X determined to be outside the 0.2 % annual (once every 500 years) chance floodplain.

Figure 1. Location Map

Figure 2. Topographic Map

1.3.4 Geotechnical Investigation

A preliminary geophysical and geotechnical investigation was conducted by Antillian Engineering Associates, Inc. in June and July of 2013. Antillian subsequently conducted more detailed geotechnical investigations in August and September of 2017. These investigations identified locations with loose soils and the potential for sinkhole formation. The site was master planned to avoid building large and/or critical structures near these anomalies. Further details can be found in the reports entitled "Preliminary Geotechnical Investigation Report Southwest Water Reclamation facility RIB Site 6 at Water Conserv II Orange County, Florida" (November 2013) and "100% Geotechnical Investigation Southwest Water Reclamation Facility Phase 1 Design" (initially issued as Draft February 2017 for the purposes of design and finalized December 2018) included in Appendix D.

1.3.5 Ecological Assessment

A preliminary ecological assessment of the project site was conducted by GAI Consultants (formerly Lotspeich and Associates, Inc) in 2013. The assessment revealed that there were no wetlands contained within the project site but that there was evidence of the presence of sand skinks, gopher tortoises and potentially other species of importance. The assessment did not, however, identify specific locations where these species were present which could change with time. The findings of this assessment are described in TM No. 2 entitled "Environmental Investigation Site Findings" dated March 2014 (Appendix C).

In February 2018, GAI conducted an assessment of the presence of gopher tortoises prior to the start of detailed design and 72 potentially occupied gopher tortoise burrows were observed. The FWC presumes a 50% occupancy rate, or a predicted population of 36 gopher tortoises. A 100% survey will be conducted approximately 90 days prior to the anticipated commencement of construction, followed by the preparation and submittal of an application for a gopher tortoise relocation permit.

In March and April of 2018, GAI conducted a cover board survey to determine the presence of sand skinks within the project site and quantified the occupied habitat to be approximately 8.84 acres. Current regulatory protocol calls for mitigating impacts to occupied habitat at a 2:1 ratio. Therefore 17.8 conservation bank credits will be required. A copy of the "Sand Skink Survey Report" dated May 2018 is included in Appendix C. A Habitat Conservation Plan and Incidental Take Permit was prepared for submittal to FWC and OCU has acquired the required conservation bank credits.

1.4 Regulatory Agencies / Permitting

The FDEP, SFWMD, Orange County, EPA, and FWC regulate the design, construction, and operation of HWRF. Together, each of these agencies ensures the procedures are safe to both humans and the environment through rigorous permitting and compliance procedures. The agencies and their involvement in the completion of this project are summarized in this section. Discussions were held with each agency and early in the final design process.

1.4.1 Florida Department of Environmental Protection

1.4.1.1 Wastewater Facilities

FDEP Form 62-620.910(1) and Form 62-620.910 (2), Wastewater Facility or Activity Permit Application Form 1 and Wastewater Application Form 2A for a Domestic Wastewater Facility Permit, will be submitted. This PER will form the basis for the permit application.

1.4.1.2 Stormwater / Environmental

Pursuant to Chapter 62-330 F.A.C., permit form 62-330.060(1), construction plans and supporting calculations will be prepared and submitted to obtain a permit for the stormwater management system.

1.4.1.3 Fuel Storage

Storage Tank Facility Registration Form 62-761.900 (2) shall be submitted to FDEP by the Contractor at least 30 days prior to installation of the fuel storage tanks.

1.4.2 Florida Fish and Wildlife Conservation Commission

The FWC regulates activities that directly involve fish and wildlife resources. Based on preliminary environmental assessment of the site, threatened or endangered species were identified at the site. Under Chapter 68A-27.005 F.A.C., a permit must be obtained to relocate threatened or endangered species.

1.4.3 Orange County

1.4.3.1 Building Department

Plans and application for an Orange County Building permit will be submitted to the Building Department.

1.4.3.2 Energy Code

Plans and specifications must comply with the Florida Energy Code. Compliance must be certified by completion of the 2017 Florida Energy Efficiency Code for Building Construction.

1.4.4 Environmental Protection Agency

1.4.4.1 Class I Reliability Requirement Summary

Class I Reliability standards are detailed in the EPA technical bulletin, “Design Criteria for Mechanical, Electrical, and Fluid System and Component Reliability”. The Class I Reliability requirements applicable to the HWRF design are summarized in Table 1.

Table 1. Class I Reliability Requirements

Component	Requirement
Mechanically-Cleaned Bar Screens	Provide a backup bar screen. The backup bar screen can be manual.
Grit Removal	No reliability required.
Pumps	Provide backup pump.
Aeration Basins	A backup basin is not required; provide at least two equal volume basins.
Aeration Blowers	Provide sufficient number of units to enable the design oxygen transfer to be maintained with the largest capacity unit out of service.
Air Diffusers	Design such that the largest section of diffusers can be isolated without measurably impairing oxygen transfer capability of the system.
Clarifiers and Filters	With largest unit out of service, remaining unit have 75% of total design flow capacity.
Chemical Flash Mixer	Provide at least two mixing basins or a backup means for adding and mixing chemicals. If only one basin, provide at least two mixing devices and a bypass around the basin.
Disinfectant Contact Basin	With the largest unit out of service, remaining units shall have 50% of total design flow (at peak hour flow).
Backup Power Source	Sufficient to operate all vital components, during peak wastewater flow conditions, together with critical lighting and ventilation.

2 BASIS OF DESIGN

2.1 Wastewater Service Area

The HWRF will serve the OCU SWSA shown in Figure 3.

2.2 Population Service Area

The Horizon West development in southwestern Orange County comprises the majority of the SWSA and is expected to be responsible for majority of the future growth in the service area.

Population projections were based on U.S. Census data for 2010, the most recent year available, as well as the most recent OCPD projections for the service area performed in 2006. In comparing actual 2010 census data to OCPD projections for 2010, growth in the service area is presently occurring at rate between the low to middle range of the 2006 projections. Table 2 summarizes adjusted current and projected population for the service area through 2030 based on the current rate of growth.

Table 2. Population Projections

Year	Population
2015	20,825
2020	27,890
2025	34,956
2030	42,021

2.3 Influent Design Flows and Loads

The design influent flows, peaking factors, concentrations and loadings used for the design of the various components of the HWRF were established and described in detail TM No.3 – Influent Wastewater Characteristics (June 27, 2014; Appendix C) and are summarized in Table 3, Table 4 and Table 5.

Additionally, the average influent flow to the facility at startup is expected to be at least 2.0 MGD AADF. The population and service area characteristics of the SWSA will be similar to the Northwest Service Area with an approximate ratio of 65% residential and 35% commercial developments. In comparison, the service area for the HWRF has approximately 35% residential and 65% commercial developments. I/I is expected to be low with the new facility.

Figure 3. HWRF Service Area

Table 3. Anticipated HWRF Flow and Loading Peaking Factors

Parameter	Flow	cBOD5 Load	COD Load	TSS Load	TKN Load	TP Load
Minimum Day	0.3	-	-	-	-	-
Maximum Month	1.3	1.2	1.2	1.2	1.2	1.2
Maximum Day	1.7	2.0	2.0	-	1.8	
Peak Hour	3.0	-	-	-	-	-

Table 4. Anticipated HWRF Influent Flows

Design Phase	AADF (MGD)	Maximum Month (MGD)	Maximum Day (MGD)	Peak Hour (MGD)
Phase 1	5	6.5	8.5	15
Phase 2	10	13	17	30
Phase 3	15	19.5	25.5	45

Table 5. Anticipated HWRF Influent Concentrations and Loadings

Influent Parameter	Annual Average Concentration (mg/L)	Annual Average Load (ppd)	Maximum Monthly Load (ppd)	Maximum Daily Load (ppd)
Flow (MGD)	5	-	-	-
COD	585	24,400	29,270	48,790
cBOD5	266	11,100	13,310	22,180
TKN	52	2,170	2,600	3,900
TP	6.0	250	300	-
Nitrate-N	0	0	0	0
pH (SU)	7.4	-	-	-
Alkalinity	251	-	-	-
TSS	259	10,800	12,960	-
VSS	233	9,720	11,660	-
Inorganic SS	26	1,080	1,300	-
Calcium	37.5	-	-	-
Magnesium	9.4	-	-	-
DO	0	-	-	-

2.4 Effluent Permit Limits

Phase 1 of the HWRF will discharge effluent to a PAR system and RIBs. The RIBs, specifically WCII Site 6 RIBS, will be used for wet weather and substandard effluent. The reclaimed water quality requirements (Chapter 62-620, F.A.C) are 5 mg/L TSS, 20 mg/L cBOD5, and 12 mg/L (weekly)/10 mg/l (monthly) nitrate-nitrogen with high level disinfection. The majority of the WCII Site 6 RIBs are in the Secondary Protection Zone for Wekiva Springs; however, portions of the WCII Site 6 RIBs are located in the Primary Protection Zone. The Wekiva Wastewater Rule (62-600.550, F.A.C.) states that when land application systems are located in two or more protection zones, the more stringent protection control measures shall apply to the entire application system. These most stringent control measures would require the reclaimed water applied to the RIBs to have annual average TN concentrations below 3 mg/L. However, the existing WCII RIB sites including RIB site 6, are exempt from the Wekiva Wastewater Rule requirements.

Groundwater samples collected in the vicinity of the HWRF site showed nitrate concentrations in the range of 4 mg/L. It is suspected that these elevated nitrate concentrations are correlated to reclaimed water applied to WCII RIB Site 6. To mitigate potential issues and meet potentially more stringent future effluent limits, OCU decided to set effluent goals of the HWRF to be that of an Advanced Wastewater Treatment facility. Key characteristics are shown in Table 6.

Table 6. Expected HWRF Effluent Goals

Parameter (maximum except where noted)	Annual Average (mg/L)	Monthly Average (mg/L)	Weekly Average (mg/L)	Single Sample (mg/L)
cBOD5	5	6.25	7.5	10
TSS	5	6.25	7.5	10
TN	3	3.75	4.5	6
TP	1	1.25	1.5	2
pH (SU), range	-	-	-	6.0-8.5
Fecal Coliform (#/100mL)	-	-75% of values below detection limits	-	25
TRC, minimum	-	-	-	1.0
DO, minimum	-	-	-	5.0
cBOD5	5	6.25	7.5	10
TSS	5	6.25	7.5	10

2.5 Effluent Disposal and Reuse

Effluent from the Phase 1 of the HWRF will be used for PAR. The SWSA PAR system will interconnect with the WCII PAR system. PAR customers in the SWSA are currently served by the WCII reuse distribution system. There is sufficient capacity in the reuse system to accommodate flows from the HWRF.

TM No. 4 entitled “Reclaimed Water Management Analysis” and dated July 11, 2014 (Appendix C) provides a detailed analysis of wet weather reclaimed water management as well as management of substandard effluent. Alternatives for managing wet weather or substandard reclaimed water from HWRF involves integration with existing WCII RIB Site 6. Excess reclaimed water will be transferred directly to the WCII transmission main and to the RIB Site 6 system. Effluent below PAR standards will be diverted to an onsite reject pond and returned to the preliminary treatment structure for retreatment. Should the reject pond be full or otherwise unavailable flow will be discharged to a dedicated subsection of RIB Site 6.

3 DESIGN CRITERIA

3.1 Hydraulic Profile and Site Layout

Raw wastewater will be pumped to the Pretreatment Structure via a 36" force main and will flow by gravity through the facility to the CCTs. Effluent from the CCTs is pumped to the PAR system, RIBs, or in-plant reuse system. The overall site layout with the proposed structures and buildings is shown in Drawing G-01 (Appendix A). The process flow diagram is shown in Drawings G-02 and G-03 (Appendix A).

The hydraulic profile for Phase 1 is shown in Drawings G-04 and G-05 (Appendix A). The hydraulic profile shows the water surface elevations at the design AADF of 5 MGD and the PHF of 15 MGD.

3.2 Preliminary Treatment

Preliminary treatment will consist of a pre-treatment structure with screening and grit removal. Plant recycles will be brought in to the pretreatment effluent splitter box downstream of screening and grit removal. Influent samples will be collected upstream of this splitter box and will therefore not include recycles. The pretreatment structure is designed to accommodate 10 MGD AADF and is expandable to 15 MGD AADF to accommodate the ultimate Phase 3, or build-out, capacity. Equipment will be added in phases as described below. A plan of the proposed structure is shown in Drawings M-01 and M-02, and a plan of the odor control system is shown in Drawing M-03 (Appendix A).

3.2.1 Screens

Mechanical band screens with 5 mm openings will be provided. In an independent study performed by the United Kingdom Water Industry Research between 1998 and 2011 and summarized in the report entitled "National Screen Evaluation Facility, Inlet Screen Comparative Report" (2011)[1], 27 screens by different manufacturers in four typical screen categories were tested. The results of this testing indicated that band screens had the highest screenings capture rate with the lowest risk of carryover or pass through. This is expected to lead to reduced operations staff time spent removing rags from downstream equipment, piping, and channels when compared to other screens. These types of screens are also expected to be installed at the EWRF.

In Phase 1, two mechanical band screens will be installed, each with a maximum capacity of 15 MGD. If one of the mechanical band screens is out of service, the second mechanical band screen in service will provide Class I reliability. A bypass channel with a manually cleaned screen will also be provided for emergency purposes.

In Phase 2, no additional screens will be added. The two mechanical band screens provided in Phase 1 will accommodate the Phase 2 PHF of 30 MGD, and the manually cleaned screen will provide Class 1 reliability. With one mechanical band screen out of service, the second mechanical band screen can accommodate flows up to the 15 MGD, which is 2 MGD more than the maximum month flow of 13 MGD.

[1] United Kingdom Water Industry Research (2011) National Screen Evaluation Facility, Inlet Screen Evaluation Comparative Report

In Phase 3, one mechanical band screen with a maximum capacity of 15 MGD and additional channel will be added. The three installed mechanical band screens will accommodate the Phase 3 PHF of 45 MGD, with the manually cleaned screen providing Class I reliability.

Screenings removed from the influent wastewater will be discharged from the top of the screen and be conveyed to two screenings washer/compactors for removal of organics and compaction prior to discharge to a dumpster. The washer/compactors are currently designed to accommodate Phases 1 and 2 flows. The washer/compactors will have to replaced and upsized to account for Phase 3 build out capacity; additionally, the Phase 3 expansion will likely coincide with the end of life for the equipment. The design criteria for the screening system are listed summarized in Table 7.

Table 7. Screening System Design Criteria

Parameter	Phase 1	Phase 2	Phase 3
Design Criteria			
Startup Flow Rate (AADF)	2 MGD	5 MGD	10 MGD
Design Flow Rate (AADF)	5 MGD	10 MGD	15 MGD
Design Flow Rate (PHF)	15 MGD	30 MGD	45 MGD
Screen Channel			
Mechanical Band Screen			
Number of Channels	2	2	3
Channel Width	1.5 feet	1.5 feet	1.5 feet
Recess Width	4.5 feet	4.5 feet	4.5 feet
Channel Depth	7.5 feet	7.5 feet	7.5 feet
Freeboard	2 feet	2 feet	2 feet
Manual Bar Screen			
Number of Channels	1	1	1
Channel Width	1.5 feet	1.5 feet	1.5 feet
Channel Depth	7.5 feet	7.5 feet	7.5 feet
Screen			
Type	Band Screen	Band Screen	Band Screen
Number of Units	2	2	3
Rated Capacity, each	15 MGD	15 MGD	15 MGD
Opening	5 mm	5 mm	5 mm
Width (max)	3.5 feet	3.5 feet	3.5 feet
HP, each	2	2	2

Parameter	Phase 1	Phase 2	Phase 3
Washer / Compactor			
Type	Screw Auger	Screw Auger	Screw Auger
Number of Units	2	2	2
Design Capacity, each	175 cubic feet per hour	175 cubic feet per hour	230 cubic feet per hour
HP, each	3	3	3

3.2.2 Grit Removal

The effluent from the screening system will flow by gravity to the grit removal system. The purpose of grit removal system is to remove sand and other grit particles from the influent that could cause wear and abrasion of downstream mechanical equipment, fill process tanks reducing effective treatment volume, or block flow channels and piping systems.

Other OCU WRFs have experienced issues with the removal of smaller grit particles and “sugar sand” that are common to Florida collection systems. Discussions with operations staff at the NWRF indicate that grit is particularly an issue for the facilities during line breaks in the collection system; recently installed grit removal equipment has not been successful at removing sufficient quantities of grit. Additionally, the presence of approximately one foot of grit in the downstream reaeration channel of a new biological treatment train, approximately 11 months after the train was placed in to service, indicates that a significant amount of grit is passing through the headworks with the existing grit removal technology. Large amounts of grit in the BNR trains can compromise the efficiency of the biological nutrient removal process, require operator time and/or operations budget to remove the grit, and can compromise aeration transfer efficiency. For these reasons OCU has elected to install a stacked tray grit removal system similar to what is expected to be installed at the EWRF. Experience with other Florida installations, as well as testing performed at other facilities, suggests that this type of grit removal system will provide a better capture of “sugar sand” and other smaller grit particles (McNamara et al (2014), Sober et al (2012), McNamara et al (2014))[2].

OCU has standardized around a stacked tray grit removal unit at their WRFs. There is presently only one type of stacked tray system available, the Eutek Headcell™, which is supplied by Hydro International. Therefore, the grit removal system will be sole sourced.

In Phase 1, two Headcell™ grit removal units will be provided at the HWRF. Each of the Headcell™ grit removal units will be fitted with eight 12-feet diameter trays with provisions for expanding the Headcell™ grit removal units to hold twelve 12-feet diameter trays in subsequent phases. The Headcell™ grit

[2] McNamara et al (2012) Evaluation of Three Full-scale Grit Removal Processes Using CFD Modeling, WEFTEC 2012 Proceedings

McNamara et al (2014) Relative Performance of Grit Removal Systems, WEFTEC 2014 Proceedings

Sober et al (2012) A Side by Side Comparison of Grit Removal Technologies: Mechanically Induced Vortex vs. Stacked Tray, WEFTEC 2012 Proceedings

removal unit is designed to remove at least 95% of all grit particles with a specific gravity of 2.65 and a particle size greater than or equal to 75-microns at 5-MGD AADF with 6-inches of headloss. The performance at 15-MGD with 12-inches of headloss is 95% removal of all grit particles with a specific gravity of 2.65 and a particle size greater than or equal to 106-microns. One Headcell™ grit removal unit will accommodate the Phase 1 PHF of 15 MGD, with the second unit providing redundant capacity. Additionally, a bypass of the grit removal system will be provided.

In Phase 2, the two existing Headcell™ grit removal units and bypass (installed in Phase 1) will accommodate the Phase 2 PHF of 30 MGD with Class 1 reliability. As the Headcell™ unit does not contain moving parts and is not expected to be taken out of service for more than a shift at a time for cleaning every few months, an additional unit or expansion of the existing grit removal units will not be provided in Phase 2. Class 1 reliability does not require a standby grit removal unit if a bypass is provided.

In Phase 3, four additional trays will be installed in each unit to increase the capacity of each unit from 15 MGD to 22.5 MGD, respectively. The modifications will accommodate the Phase 3 PHF of 45 MGD. Additionally, the grit pumps, grit snails, and grit dewatering units will likely have to be replaced in Phase 3, and the Phase 3 expansion will likely coincide with the end of life for the equipment.

Settled grit will be pumped from the underflow collection chamber to the grit washer/classifier unit. The grit dewatering unit will capture and dewater concentrated, washed grit slurry from the grit washer/classifier unit.

Design criteria for the grit removal system are provided in Table 8.

Table 8. Grit Removal System Design Criteria

Parameter	Phase 1	Phase 2	Phase 3
Design Criteria			
Startup Flow Rate (AADF)	2 MGD	5 MGD	10 MGD
Design Flow Rate (AADF)	5 MGD	10 MGD	15 MGD
Design Flow Rate (PHF)	15 MGD	30 MGD	45 MGD
Grit Removal System			
Type	Eutek Headcell™	Eutek Headcell™	Eutek Headcell™
Number of Units	2	2	2
Rated Capacity, each	15 MGD	15 MGD	22.5 MGD
Number of Trays, each	8	8	12
Tray Diameter	12 feet	12 feet	12 feet
Grit Washing / Classifier			
Type	Slurry Cup™	Slurry Cup™	Slurry Cup™

Parameter	Phase 1	Phase 2	Phase 3
Number of Units	2	2	2
Diameter	24 inches	24 inches	32 inches
Design Flow, each	200 gpm	200 gpm	300 gpm
Manufacturer	Hydro International	Hydro International	Hydro International
Grit Dewatering			
Type	Grit Snail™	Grit Snail™	Grit Snail™
Number of Units	2	2	2
Clarifier, each	5 feet long by 5 feet wide	5 feet long by 5 feet wide	5 feet long by 5 feet wide
Belt Width, each	6 inches	6 inches	12 inches
Design Capacity, each	1 cy / hour	1 cy / hour	2 cy / hour
HP, each	0.33	0.33	0.33
Manufacturers	Hydro International	Hydro International	Hydro International
Grit Pump			
Type	Recesses impeller, vortex	Recesses impeller, vortex	Recesses impeller, vortex
Number of Units	3	3	3
Design Flow, each	200 gpm	200 gpm	300 gpm
HP, each	10	10	15

3.2.3 Odor Control

The odor control system will be designed to treat H_2S, volatile organic and other reduced sulfur compounds that are typical of municipal wastewater treatment processes. Odors from a preliminary treatment structure tend to be primarily comprised of H_2S. Odorous air characteristics emitted from preliminary treatment structures are highly dependent on the raw wastewater characteristics, hydraulic residence time in the collection system, septage discharges, turbulence in the structure(s), and sidestream characteristics.

Since actual odor data is not available for HWRF, sampling was conducted at OCU's NWRF (whose wastewater characteristics are expected to be most similar to HWRF) in October 2018 to estimate the expected range of concentrations of odor causing compounds. H_2S concentrations averaged 32 ppm, with a range of 0 to 191 ppm; concentrations of other typical componds were non detectable.

The odor control system will consist of a biotrickling filter followed by a polishing stage of activated carbon in a dual-stage odor control unit. Air will be treated from beneath the channel covers, as well as the exhaust ventilation flows from the Container Room and the Materials Room. The total air volume from

both areas results in a relatively small air flow, therefore, the combined air flow will be ducted to one dual-stage odor control unit.

Consideration was given to isolate screenings and grit containers to exhaust odorous air directly off the top of the containers; however, the room's monorail extends directly over the top of this area making this incompatible for this option.

Ventilation airflow from the Container Room and the Materials Room should keep this space negative in relation to ambient/outdoor pressure. A total of 3,600 cfm will be ducted from these rooms, and a make-up air flow rate of 3,200 cfm will be supplied. Several exhaust pick-up points will extend down to roughly 12 inches above the finished floor(s) to capture heavier than air compounds.

The ventilation air from the Container Room and Materials Room may have a lower level of odorous compounds. It is assumed that the biotrickling filter will acclimate itself to treat most of the compounds sent to it, and the carbon adsorber will adsorb the remaining odors.

All odor control ductwork shall be of round FRP construction. The Container and Materials Room can be rated as Unclassified per NFPA, 820 2016 Edition, Table 6.2.2(a) Row 2. To provide a level of mechanical redundancy, the odor control system will be designed to have two odor control fans ducted in parallel.

The design basis for the odor control system are summarized in Table 9. The service conditions for the major equipment are summarized in Table 10.

Table 9. Pretreatment Structure Odor Control System Basis of Design

Area	Volume or Area	Basis	Air Flow Rate, cfm
Container Room	9700 CF	6 ach	970
Materials Handling Room	23,100 CF	6 ach	2,310
Channels	1,260 SF	½ cfm / SF cover	750
Duct Leakage / Safety Factor		10%	405
Total Odor Control Volume			**4,435**

Table 10. Pretreatment Structure Odor Control System Design Criteria

Parameter	Design Condition
H_2S Concentration to Biotrickling Filter, Minimum	0 ppm
H_2S Concentration to Biotrickling Filter, Average	32 ppm
H_2S Concentration to Biotrickling Filter, Peak	191 ppm
Inlet air temperature	30 - 100°F
Inlet air relative humidity	30 - 100%
Empty Bed Retention Time, Minimum	15 seconds
Biotricking Filter H_2S Removal Efficiency, minimum (%)	99% of H_2S greater than 10 ppm at inlet; Less than or equal to 0.1 ppm all other conditions.
Activated Carbon Bed Depth, Minimum	3 feet
Carbon Bed Face Velocity, Maximum	55 feet/minute

3.3 Plant Recycles and Plant Drain Pump Station

RAS, filter backwash, filtrate (or centrate in future phases), decant from the SHTs, and other plant recycles will be returned to the effluent end of the Pre-treatment Structure, where it mixes with screened and degritted effluent prior to going to the biological nutrient removal process. Flow from the reject pond will be returned upstream of the effluent splitter box, downstream of grit removal; however, this will not typically occur. The Pretreatment Structure Effluent Splitter Box will be sized for Phase 1 and will be expanded again at each subsequent phase. Typical recycles are estimated as shown in Table 11 and Table 12 summarizes the design criteria for the plant drain pump station, which is sized to accommodate Phase 1 to 3.

Table 11. Typical Plant Recycle Flow Rates

Source	Phase 1 Flow Rate (mgd)	Phase 2 Flow Rate (mgd)	Phase 3 Flow Rate (mgd)
Filter Backwash	0.25	0.50	0.75
Filtrate(1)	0.17		
Centrate(2)		0.20	0.30
Decant	0	0.25	0.4
Other Miscellaneous	0.28	0.45	0.6
Total	**0.7**	**1.4**	**2.1**

Notes:

1. Filtrate flow 1 GBT 8 hrs a day, 5 days a week @ 350 gpm (0.5 mgd)
2. Centrate 2-3 Flow 6 hrs day, 4 days a week @ 550 gpm

Table 12. Plant Drain Pump Station Design Criteria

Parameter	Phase 1-3
Type	Submersible End Suction Centrifugal with VFD
Number of Pumps	3 (2 duty / 1 standby)
Capacity (each)	1836 gpm
Head (approx.)	48.8 feet
Motor (each)	34 HP

3.4 Biological Nutrient Removal

Biological nutrient removal will be acocmplished by a 5-Stage Bardenpho process with provisions for supplemental carbon and metal salt addition. This process was selected after an evaluation based on both economic and non-economic factors of two alternatives: Step Feed BNR and the 5-Stage Bardenpho. Details of the evaluation can be found in TM No. 5 “Biological Process Alternatives” dated March 3, 2015 (Appendix C).

Two, parallel 2.5 MGD AADF Activated Sludge Treatment Trains will be constructed during Phase 1. Four additional trains will be added in both Phases 2 and 3, for a total of 6 trains to reach the ultimate build-out capacity of 15 MGD AADF. The Activated Sludge Tratment Train system consists of the following biological zones and related equipment:

- Anaerobic zone (Anaerobic 1 and Anaerobic 2)
- Anaerobic/anoxic swing zone (Swing 1)
- First Anoxic zone (1st Anoxic 1)
- Anoxic/Aerobic swing zone (Swing 2)
- Aerobic zone (Aerobic 1 and Aerobic 2)
- Aerobic/2nd Anoxic swing zone (Swing 3)
- 2nd anoxic zone (2nd Anoxic 1 and 2nd Anoxic 2)
- Re-aeration zone (Reaeration)
- Nitrified Recycle/Internal Recycle (NRCY/IR) Pump Station (from Aerobic to 1st zone)
- Fine bubble diffusers (in Aerobic zones)

- Process air blowers (air to the Aerobic zones)
- Mechanical mixers (for anaerobic, anoxic, and swing zones)
- Metal salt (alum) feed system (as needed prior to secondary clarifiers and prior to filtration, described in Section 3.12.2)
- Supplemental carbon feed system (as needed to 2nd anoxic zone, described in Section 3.12.3)
- Scum collection

Volumes of the various zones derived from process modeling are summarized in Table 13 and a layout of a basin is shown in Drawings M-04 and M-05 (Appendix A).

The sections below summarize the recommendations for the major components of the BNR process and the Activated Sludge Treatment Trains.

Table 13. BNR Process Design Volumes per Zone (Phase 1)

Zone	Process Design Volume, MG
Anaerobic 1	0.15
Anaerobic 2	0.15
Anaerobic/1st Anoxic Swing (Swing 1)	0.15
1st Anoxic 1	0.32
Anoxic/Aerobic Swing (Swing 2)	0.32
Aerobic 1	0.70
Aerobic 2	0.70
Aerobic/2nd Anoxic Swing (Swing 3)	0.73
2nd Anoxic 1	0.34
2nd Anoxic 2	0.34
Reaeration	0.15
Total Volume, Phase 1	**4.0**

3.4.1 Fine Bubble Membrane Diffusers

The oxygen requirements for the BNR trains were determined from BioWin modeling and additional calculations using influent characteristics established in previous Technical Memoranda (Appendix C). The aeration system must provide sufficient DO to meet both $cBOD_5$ removal and nitrification goals under varying loading and temperature conditions. The basis of design for the aeration system is to provide either greater or maintaining:

- DO concentration of 2.0 mg/L at the MMF loading during the summer months (water temperature of 26 °C).
- DO concentration of 1.0 mg/L at the MDF loading at a water temperature of 31°C.

During MMF and MDF summer conditions the aerobic/2nd anoxic swing zone (Swing 3) is operating as an aerobic zone. Modeling indicated that the MDF aeration requirement at a DO concentration of 1.0 mg/L is expected to be greater; therefore, this will dictate the aeration design and blower capacity for the HWRF.

Similar to the OCU's other WRFs, the HWRF will provide aeration through fine bubble porous membrane disc diffusers. The diffusers will be installed on headers mounted one foot above the bottom of the tank in grid formation in the aeration zones, the anoxic/aerobic swing zones, and the reaeration zone. The number of diffusers in each zone was determined based on the oxygen requirements and providing sufficient diffusers to maintain a target airflow of 1.25 to 1.5 SCFM per diffuser at the average condition and 2.5 SCFM per diffuser at the maximum condition. The minimum air flow required for mixing of each aerobic zone is 0.12 scfm per square foot to keep MLSS in suspension. Table 14 summarizes diffuser design criteria.

Table 14. Diffuser Design Criteria

Parameter	Design Condition
Design Criteria for Diffusers	
DO Concentration	2.0 mg/L at MMF, 1.0 mg/L at MDF
AlphaF	1.0
Wastewater Temperature	26 °C at MMF, 31 °C at MDF
Diffuser Operating Range	0.5 – 3 scfm/diffuser
Design airflow per diffuser (AADF)	1.5 scfm/diffuser
Maximum Design Flow per diffuser	3.0 scfm/diffuser
Aeration Basin	
Number Aerobic Zones	3
Number of Swing Anoxic/Aerobic Zones	2
Aeration Basin Zone Dimensions	
Zone Width	30 feet
Zone length	Varies
Zone Side Water Depth	19 feet
Freeboard	24 inches
Diffusers	
Type	Fine bubble porous EPDM(1) membrane disc

Disc Size	9-inch
Minimum Diffuser Submergence	18 feet
Mounting Location	Floor
Tank	**Number of Units per Train**
Swing 2	391
Aerobic 1	1,000
Aerobic 2	600
Swing 3	354
Reaeration	90
Total	**2,435**

Notes:

1. EPDM - ethylene propylene diene monomer

3.4.2 Mechanical Mixers

Mechanical mixers are required in all zones without aeration (anaerobic, anoxic, and swing zones) in order to maintain the mixed liquor solids in suspension. The use of mixers in unaerated zones at other OCU facilities in the past has been challenging due to the tendency of wastewater applications to develop stringy solids called “rags.” This fibrous material can cause equipment to foul, resulting in increases to maintenance costs and added downtime due to mechanical damage and equipment shutdowns;additionally, the fibrous materials can cause mixing impellers to lose their efficiency, vibrate and overload.

OCU completed a mechanical mixer pilot study in 2013 to evaluate non-ragging mixer technology for installation within process basin unaerated zones. Two styles of mechanical mixers were evaluated: 1) hyperboloid mixers, designed without blades to which rags can attach, and 2) non-ragging type vertical turbine blade mixers. Only the mixer manufacturers and model types that passed evaluation through the mixer pilot study are currently permitted by OCU for use at its WRFs in future projects. Further details on the mixers can be found in TM No. 7 “Major Process Components” in Appendix C

Mixers will be located in each of the zones identified in Table 15, below.

Table 15. Aeration Basin Mixers Design Criteria

Zone	No. of Mixers per Tank per Zone	Zone Length (ft)	Zone Width (ft)	Zone SWD (ft)	Zone Volume (CF)	Mixer HP Estimate, each
Anaerobic 1	1	19	30	18	10,250	1.5
Anaerobic 2	1	19			10,250	1.5
Swing 1	1	19			10,250	1.5
1st Anoxic	1	40			21,000	5
Swing 2	1	40			21,000	5
Swing 3	3	90			49,000	2
2nd Anoxic 1	1	42			23,000	5
2nd Anoxic 2	1	43.5			23,000	5

3.4.3 Nitrified Recycle/Internal Recycle Pump Station

As part of the 5-stage Bardenpho process, nitrified mixed liquor from the end of the Aerobic (or Swing 3) zones is pumped to the first anoxic zone. There carbon from the influent wastewater is utilized to convert nitrates produced in the aerobic zone to nitrogen gas in the anoxic zone. The NRCY/IR pump station will be located outside of the activated sludge treatment trains. Locating the pump station, valves, and meter station outside of the activated sludge treatment trains allows for easier access to the equipment for maintenance and rehabilitation. An external NRCY/IR pump station is typical for the OCU WRFs, with the exception of the EWRF step-feed basins.

Each treatment train will have an external duplex pump station and metering station. The metering station will allow for increased control and monitoring of the NRCY flow. End-suction horizontal non-clog pumps with VFDs are the proposed type of pump to be used in the pump station. This type of pump station configuration is currently being employed at the NWRF.

One challenge typical to NRCY pumps is that since the static head on the suction and discharge tend to be similar when pumping internal to the treatment train, almost the entire TDH is from velocity head and minor losses. End-suction horizontal non-clog pumps with VFDs are the preferred pump for NRCY due to their typically low head requirement. The pumps are sized to provide 400% recycle flow on an AADF basis by using two pumps and have the ability to be able to be turned down to the low flow condition with one pump. VFDs are necessary for the NRCY pumps to be able to pace the recycle flow rate with the plant influent flow rate. Each treatment train will have two inlet points and two discharge points; however, only one of each is designed to be used at a given time. Isolation valves for the inlet piping will be located outside of the treatment train. Isolation slide gates will be used to change the discharge location to either the anoxic zone or the anaerobic/anoxic swing zone. Each pump will have suction and discharge isolation valves, suction and discharge dismantling joints, a discharge check valve and a discharge air

release valve. Figure M-06 shows a plan of the NRCY pump station and piping. Table 16, below, presents the design criteria for the NRCY pump station.

Table 16. NRCY Pump Station Design Criteria

Parameter	Design Condition
Pump type	End-suction horizontal non-clog
Number of pumps per basin	2 duty, 0 standby
Influent Flow per train, AADF, Q	1,736 gpm (2.5 MGD)
Maximum NRCY flow rate, per basin (4Q @ AADF)	6,944 gpm (10 MGD), two pumps
Minimum NRCY flow rate, per basin (1.2Q @ AADF)	2,000 gpm (2.88 MGD), one pump
Duty point, each pump	3,500 gpm at 18 feet TDH
Minimum flow at pump turn down, each pump	2,000 gpm at 3 feet TDH
Motor HP, each pump	25 HP
Control description	Pumps supplied with VFDs and flowmeters. NRCY flow rate will be automatically paced in the proportion to influent flow rate. The operator will manually adjust the proportional control factor (% of influent flow).

3.4.4 Scum Collection

A single 125 gpm, 5 HP double disc, positive displacement pump will collect scum from the treatment train surface, with each treatment train having a dedicated scum pump. Scum will be sent to the solids holding tanks.

3.4.5 Process Air Blowers

Process air blowers will be used to supply air to the diffusers in the activated sludge treatment trains. OCU has elected to install multistage centrifugal blowers similar to those being installed at the EWRF and existing at SWRF. Air flow requirements for the blowers were established from the design of the diffusers as outlined in Section 3.4.1. Table 17 below summarizes the total airflow requirements under various conditions for the process air blowers.

Table 17. Process Air Flow Requirements

Parameter	Temperature (°C)	Total Air Flow Required (scfm)			
		Phase 1 Startup (2 MGD)	Phase 1 Design (5 MGD)	Phase 2 (10 MGD)	Phase 3 (15 MGD)
Minimum	20	472 (750)	3,850	7,700	11,550
Average	26	2,128	5,320	10,640	15,960
Maximum Month	31	2,716	6,790	13,580	20,370
Maximum Day	31	3,940	9,850	19,700	29,550

The blowers were designed to ultimately provide the total air flow required (29,550 scfm) at Phase 3, with the largest blower out of service. Additionally, consideration was also given to ensure that the low air flow conditions at startup could be met. For higher flows, a larger blower is recommended as the larger blowers generally provide the most efficient operation. However, at the lower flows, smaller blowers are recommended to provide sufficient turndown capacity to meet the low flows at the minimum conditions.

In Phase 1, three small (150 HP) blowers, one medium (300 HP) blower, and one large (700 HP) blower will be installed. Firm capacity is with the larger blower out of service. The blowers will be constant speed with inlet valve control to cover the entire range of flow rates. Based on the flow data on wastewater in the OCU service area currently being diverted to the Reedy Creek WRF but would be eventually sent to HWRF, the minimum air flows required during startup were determined to be 472 scfm. The smallest blower can turn down to 750 scfm. It was determined that it was not cost effective to add an additional smaller capacity blower to cover the low flows at startup. Additional space and footprint would be required to accommodate the additional blower and the need to operate at these flows is expected to be infrequent and only near startup of the facility. Blowoff of air may be required during the early stages of Phase 1 overnight.

One additional large blower will be added at Phase 2 and again at Phase 3 for an ultimate total of three small blowers, one medium blower, and three large blowers. At the maximum day flow at Phase 3, a large blower can be taken out of service and the three small blowers, one medium blower and two large blowers will be able to meet air flow requirements. This will allow for Class 1 reliability requirements to be met, while allowing flexibility to more efficiently meet the range of air flows required.

Table 18 summarizes the design criteria for the blowers. Drawing M-07 (Appendix A) shows a layout of the proposed Blower Room in the Blower and Main Electrical Building

Table 12. Process Air Blower Design Criteria

Parameter	Design Condition
Design Criteria for Process Air Blowers	
Aeration Criteria	See Table 14
Wastewater Temperature	See Table 17
Minimum Airflow (minimum day at startup, 20 °C)	750 scfm
Maximum Airflow (maximum day at buildout, 31 °C)	29,550 scfm
Blower Discharge Pressure	10.5 psig
Process Air Blowers	
Type	Multistage Centrifugal
Small Blower Range	750 to 1642 scfm; 122 HP
Medium Blower Range	2339 to 4925 scfm; 298 HP
Large Blower Range	5300 to 9850 scfm; 632 HP
Number of Blowers	
Phase 1	5 Total: 3 small, 1 medium, 1 large
Phase 2	6 Total: 3 small, 1 medium, 2 large
Phase 3	7 Total: 3 small, 1 medium, 3 large

3.5 Clarifiers

The secondary clarification process will allow the activated sludge to separate from the effluent. Effluent will then be directed downstream to the filters. Scum will be collected for further processing and settled sludge will either be pumped to the biological process as RAS or pumped to the sludge handling process as WAS.

3.5.1 Clarifiers

Design of the secondary clarifier is based on guidance provided in the “Recommended Standards for Wastewater Facilities” (2004), more commonly known as the Ten States Standards. For an extended aeration or single stage nitrification process, it is recommended that a surface overflow rate of 1000 gallons per day (gpd) per SF not be exceeded at PHF and a solids loading rate of 35 ppd/SF not be exceeded at maximum day flow. Additionally, Class 1 reliability, which requires that 75% of the design (peak hour or maximum day) flow be accommodated with one clarifier out of service, was provided. Table 19 summarizes the basis of design for the clarifiers.

Table 19. Secondary Clarifier Basis of Design

Parameter	Phase 1	Phase 2	Phase 3
Influent			
Design Flow Rate (MDF)	8.5 MGD	17 MGD	25.5 MGD
Design Flow Rate (PHF)	15 MGD	30 MGD	45 MGD
RAS			
Design Flow Rate (all flows)	4.8 MGD	9.6 MGD	14.4 MGD
MLSS			
Design MLSS (MDF, PHF)	3,500 mg/L	3,500 mg/L	3,500 mg/L

Three 100-foot diameter clarifiers will be constructed in Phase 1. One additional clarifier will be constructed in Phase 2 and two additional will be constructed in Phase 3, for a total of 6 clarifiers at build-out. The most recently constructed clarifiers at EWRF have a spiral blade sludge withdrawal mechanism. Since OCU is familiar with this equipment and a spiral blade type unit is suitable for this clarifier diameter, a spiral blade mechanism (center-drive) is recommended for the HWRF.

Table 20 summarizes the design criteria for the clarifiers. Drawing M-08 (Appendix A) shows a plan of the clarifiers.

Table 20. Secondary Clarifier Design Criteria

Parameter	Phase 1	Phase 2	Phase 3
Number of units	3	4	6
SOR (gpd/SF) at PHF	637	955	955
SLR (ppd/SF) at MDF and 3500 mg/L	16.5	24.7	24.7
Diameter (feet)	100		
Side Water Depth (feet)	14		
Type	Circular, Cast-in-Place		
Sludge Withdrawal Mechanism	Spiral Blade		

To be consistent with clarifiers recently constructed at other OCU WRFs, the HWRF each clarifier will also include an energy dissipating inlet, density current baffle and sludge blanket level monitoring. A weir cleaning system will also be added.

3.5.2 Scum Collection

A single 100 gpm, 5 HP double disc, positive displacement pump will collect scum from the from the clarifier surface, with each clarifier having a dedicated scum pump. Scum will be sent to the solids holding tanks.

3.6 RAS / WAS Pumps

Settled sludge from the secondary clarifiers will be pumped as RAS to the effluent end of the pre-treatment structure or as WAS to the SHTs. Typically, non-clog centrifugal type units have been installed at other OCU WRFs. Therefore, since OCU operations staff are familiar with this type of equipment, these will also be installed at the HWRF.

The pumping arrangement for the clarifiers will be consistent with the other RAS and WAS pumping systems recently constructed at OCU WRFs. Sludge will be withdrawn directly from each clarifier. Three RAS pumps will be provided for each pair of clarifiers, with two operating (one per clarifier) and one common stand-by. For the WAS pump, two units will be provided for each pair of clarifiers with one operating and one stand-by. Both the RAS and WAS pumps will be provided with VFD speed control, and total solids concentration will be continuously monitored. In addition, the RAS flow from each clarifier will be metered, as will the WAS flow from each clarifier pair.

Table 21 summarizes the design criteria for the RAS and WAS pumps. Drawing M-09 (Appendix A) shows a plan RAS/WAS pump station.

Table 21. RAS and WAS Pumps Design Criteria

Parameter	Phase 1	Phase 2	Phase 3
RAS			
Flow (at all influent flows), MGD	4.8	9.6	14.4
RAS Concentration (mg/l)	6,800	6,800	6,800
RAS Pumps			
Type	non-clog centrifugal with VFD	non-clog centrifugal with VFD	non-clog centrifugal with VFD
Number			
Operating	3	4	6
Standby	2	2	3
Total	5	6	9
Capacity, gpm	1,740	1,740	1,740
WAS Pumps			
Number			

Parameter	Phase 1	Phase 2	Phase 3
Operating	2	2	3
Standby	2	2	3
Total	4	4	6
Capacity, gpm	193	193	193

Notes:

1. For Phase 1, two RAS pumps (one operating and one standby) and two WAS pumps (one operating and one standby) will be provided at the third clarifier.
2. Since three clarifiers are recommended for Phase 1 (for redundancy), if all clarifiers are in-service, the required capacity per pump will be approximately 1,200 gpm (which is lower than the design). To achieve a lower flow rate for Phase 1, smaller diameter impellers can be installed, and the impeller can be replaced for future phases (to achieve the design flow rate of 1,740 gpm). Alternately, OCU may alternate operation of the clarifiers, so only two units are operating at the same time.

3.7 Filters

Chapter 62-610.450 F.A.C. requires that the reclaimed water or effluent contain no more than 5 mg/L of TSS. The 2011 Facility Plan recommended the installation of disk type filters downstream of the secondary clarifiers for additional removal of solids prior to chlorination. In addition to facilitating compliance with the fecal coliform requirements, filters will also be necessary to consistently achieve TN and TP effluent limits through the removal of nitrogen and phosphorus associated with the solids.

OCU performed full scale, side-by-side pilot testing of three disk filters at the SWRF in 2013. Participation was mandatory for vendors of disk filters to be eligible to bid for future filter installations at any of the OCU WRFs. Based on the results of the testing, three filters were pre-qualified and will be named as approved manufacturers for this project:

- Aqua Aerobic (Aqua Disk)
- Alfa Laval (Iso-Disc)
- Five Star Filtration (Five-Star Disc Filter)

The disk filters will be sized to provide sufficient filter area to treat the PHF and meet the maximum 6.5 gpm/SF hydraulic loading rate with all units online, as recommended based on the results of the pilot testing. Class I reliability, which requires that there be sufficient volume to treat 75% of the peak design (hourly) flow with the largest unit out of service, will also be provided. Filters will be stand-alone enclosed units supplied by the manufacturer.

The design criteria for the filters are summarized in Table 22. Drawing M-10 (Appendix A) shows a plan view of the Filters, with a typical filter for the three manufactures shown.

The filter structure will be sized to accommodate the number of filters required for Phase 1 and Phase 2. In Phase 3, an additional structure would be built adjacent to this structure to accommodate the final number of units for full capacity build out.

Table 22. Filter System Design Criteria

Parameter	Design Criteria		
Filtration			
Filter Influent Quality (targeted)			
Average TSS (mg/L)	10		
Maximum TSS (mg/L)	20		
Effluent Quality			
Maximum TSS (mg/L)	<5		
Filters			
Type	Disk	Disk	Disk
Manufacturer	Five Star	Aqua Aerobic	Alfa Laval
Minimum net filter surface per disk (SF)	72	53.8	96
Recommended loading rate (from pilot) (gpm/SF)	6.5	6.5	6.5
Phase 1			
Average Daily Flow	5.0 MGD		
Flow, Peak Day	8.5 MGD		
Flow, Peak Hourly	15.0 MGD		
Number of units	3	3	3
Disks per unit	10	12	7
Effective submerged filter surface area per unit (SF)	2160	1936	2016
Average loading rate (gpm/SF)	1.6	1.8	1.7
Peak loading rate (gpm/SF)	4.8	5.4	5.2
Class I Reliability loading rate (gpm/SF)	5.4	6.1	5.8
Phase 2			
Average Daily Flow	10.0 MGD		
Flow, Peak Day	17.0 MGD		
Flow, Peak Hourly	30.0 MGD		
Number of units	5	4	5

Parameter	Design Criteria		
Disks per unit	10	14	7
Effective submerged filter surface area per unit (SF)	3600	3013	3360
Average loading rate (gpm/SF)	2.1	2.3	2.1
Peak loading rate (gpm/SF)	5.2	5.8	5.2
Class I Reliability loading rate (gpm/SF)	5.1	5.8	4.8
Phase 3			
Average Daily Flow		15.0 MGD	
Flow, Peak Day		25.5 MGD	
Flow, Peak Hourly		45.0 MGD	
Number of units	9	7	8
Disks per unit	10	14	7
Effective submerged filter surface area per unit (SF)	5184	5272	5376
Average loading rate (gpm/SF)	1.8	2.0	1.9
Peak loading rate (gpm/SF)	5.2	5.9	5.8
Class I Reliability loading rate (gpm/SF)	4.5	5.2	5.0

3.8 Chlorine Contact Tank

Effluent from the filters is discharged by gravity to the CCT inlet. The CCT will provide high-level disinfection for public access reuse as specified in Rules 62-600.440 (5) and 62-610.460 F.A.C.

According to Chapter 62-600.440, high-level disinfection should produce an effluent with no detectable fecal coliforms. A minimum chlorine residual of 1.0 mg/L should be attained with a minimum contact time of 15 minutes at the PHF.

FDEP regulation 62-600.440 prescribes values for CT (C, residual disinfectant concentration (mg/L), times T, contact time (minutes)) for specific treatment and disinfection conditions to achieve desired levels of pathogen inactivation under various conditions. The required detention time in the chlorine contact tank is dependent on the concentration of fecal coliforms in the influent that enters the disinfection process. The FDEP regulatory criteria are summarized below:

- For a reclaimed water or effluent containing up to 1,000 fecal coliforms, per 100 mL before disinfection, the CT shall be at least 25.
- For a reclaimed water or effluent containing greater than 1,000 and up to 10,000 fecal coliforms per 100 mL before disinfection, the CT shall be at least 40.

- For a reclaimed water or effluent containing more than 10,000 fecal coliforms per 100 mL before disinfection, the CT shall be at least 120.

The design for the CCTs and hypochlorite feed system will be based on the assumption that the reclaimed water or effluent will contain between 1,000 and 10,000 fecal coliforms per 100 mL, which requires a CT value of at least 40. With a design CT value of 40, the CCTs will require 2.0 mg/L free chlorine residual at PHF with a minimum of 20-minute contact time. At lower flows, the contact time will increase, allowing the required free chlorine residual to be reduced. Nevertheless, a minimum 1.0 mg/L free chlorine residual will be maintained at all times.

The CCTs will be sized to provide sufficient contact volume to treat the PHF with all units online. Additionally, Class I reliability requirements, which state that sufficient volume be provided to treat 50% of the peak design (hourly) flow with the largest unit out of service, will be met. One CCT will be provided for Phase 1. The CCT will be divided in to two basins to allow for one basin being taken out of service while still meeting Class 1 reliability. Each basin will have 3 passes. One similar CCT will be provided during each of the expansions in Phase 2 and Phase 3, respectively, for a total of three CCTs at ultimate Phase 3 build out.

Table 23 summarizes the design criteria for the Phase 1 CCTs. Drawing M-11 (Appendix A) shows a plan view of the CCTs.

Table 23. Chlorine Contact Tank Design Criteria

Parameter	Phase 1	Phase 2	Phase 3
Hydraulic Flow			
PHF (MGD)	15	30	45
Chlorine Contact Tank			
Design CT (@PHF)		40 mg-min/L	
Design CT (@PHF)		40 mg-min/L	
Disinfectant		sodium hypochlorite @ 12.5%	
Number of Tanks	1	2	3
Number of Basins	2	4	6
Number of Passes	3	6	9
Dimensions			
Channel depth (ft)	12	12	12
Channel length (ft)	100	100	100
Channel Width (ft)	8	8	8
Total Volume (gal)[(1)]	430,877	861,754	1,292,630
Contact Time (min)			

Parameter	Phase 1	Phase 2	Phase 3
AADF (all units online)	60	60	60
MDF (all units online)	35	35	35
PHF (all units online)	20	20	20
Minimum Cl_2 Residual (mg/L) @ PHF	2.0	2.0	2.0

Notes:

1. Total volume does not include turns for conservatism.

3.9 Reject Pond and Return Pump Station

Effluent from HWRF will be used for PAR in the SWSA. The SWSA PAR system will interconnect with the WCII PAR system. Excess reclaimed will be transferred directly to the WCII transmission main and to the RIB Site 6 system. The RIB Site 6 system also services as a secondary location for substandard effluent. Although reject storage is not required, for increased operational flexibility, a 5 MG lined reject pond will be constructed. Effluent not meeting PAR standards will be first directed to the reject pond for storage and eventual pumping via a reject return pump station to the pre-treatment structure, downstream of grit removal, for retreatment. Should the reject pond be full or otherwise unavailable flow will be discharged to a dedicated subsection of RIB Site 6. Additional reject storage capacity for future phases can be accommodated west of the GSTs in the form of storage tanks.

The reject return pump station will be sized to allow for return of the 5 MG to the pre-treatment structure in a 2 to 3 day period. Diversion to the reject pond will be automatic upstream of the filters based on TSS concentration and downstream of the CCTs based on chlorine residual. The pump station will contain 3, submersible end suction centrifugal pumps. Table 24 summarizes the reject return pump station design criteria.

Table 24. Reject Return Pump Station Design Criteria

Parameter	Phase 1
Type	Submersible End Suction Centrifugal
Number of Pumps	3 (2 duty / 1 standby)
Capacity (each)	1065 gpm
Head (approx.)	50 feet
Motor (each)	30 HP

3.10 Effluent Transfer Pump Station

Low-lift vertical pumps will be provided at the end of the CCTs to lift chlorinated water to the GSTs located on the western side of the HWRF site. It is assumed that a typical pre-stressed concrete GST will have a 5 million gallon volume and a height of approximately forty feet. Internal stand pipes are recommended. An additional tank will be added at each phase (Phase 2 and 3) through buildout.

The goal in the design of the pumps (shown in Drawing M-11) was to minimize the total number, while allowing the lower flows to be covered by the turndown provided by the VFDs. The standby pump is to maintain firm capacity and Class I reliability requirements.

At Phase 1, the station will be designed for three, 150 HP pumps (2 duty/ 1 standby). Two, 150 HP pumps will yield about 10,417 gpm in order to meet the required design capacity of 15.0 MGD or 10,417 gpm at PHF.

For Phases 2 and 3, two additional 150 HP pumps will be added at each phase.

This reduced the total horsepower required and there is consistency with all the pumps being the same size. Therefore, for Phase 2, two 150 HP pumps (2 duty) will be added. These two pumps running will provide a firm capacity of about 20,840 gpm or 30 MGD (Phase 2 PHF). For Phase 3, two additional 150 HP pumps will be added to increase the firm capacity of the station to 45 MGD. The pump stations will initially be designed for a total of three,150 HP pumps (2 duty/1 standby) for Phase 1, with four additional spaces for the Phase 2 and Phase 3 future pumps.

Table 25 summarizes the effluent transfer pump station design criteria. Drawing M-11 (Appendix A) shows a plan the effluent pump station.

Table 25. Effluent Transfer Pump Station Design Criteria

Parameter	Phase 1	Phase 2	Phase 3
Type	Vertical Turbine Pump with VFD	Vertical Turbine Pump with VFD	Vertical Turbine Pump with VFD
Number of Pumps	3 (2 duty / 1 standby)	5 (4 duty / 1 standby)	7 (6 duty / 1 standby)
Capacity (each)	5208 gpm	5208 gpm	5208 gpm
Head (approx.)	80 feet	80 feet	80 feet
Motor (each)	150 HP	150 HP	150 HP
Total Motor HP	**450 HP**	**750 HP**	**1050 HP**

3.11 Reclaimed Water Storage and Reclaimed Water/Non-PAR High Service Pump Station

As discussed in TM No. 4 “Reclaimed Water Management Analysis” (Appendix C), the HWRF Reclaimed Water/Non-PAR High Service Pump Station will be designed to pump reclaimed water at sufficient pressure into the SWSA distribution system to serve either the SSA or WCII systems. Preliminary hydraulic modeling for the 2012 SWSA Conveyance Facility Plan Conceptual Analysis indicated that the year 2030 peak hour reclaimed water demand is expected to be approximately 30 MGD (31,000 gpm; based on a peaking factor of 6) with line pressures in the 100-psi range.

The SWSA Conveyance Analysis recommended the delivery of HWRF reclaimed water directly to the western portion of the OCU SWSA for PAR irrigation. This would include a new, approximately 6,500-foot-long, 36-inch reclaimed water main extending eastward from the Reclaimed Water/Non-PAR High Service Pump Station, through the WCII RIB Site 6, to connect to the existing OCU SWSA PAR system at Bridgewater Crossings Boulevard. The connection from the Reclaimed Water/Non-PAR High Service Pump Station to the WCII PAR system at the New Independence Parkway would require a similar pipeline.

Excess wet weather flow and flow not meeting PAR requirements will be pumped from the Reclaimed Water/Non-PAR High Service Pump Station to the RIBs rather than to the PAR systems. The pressure requirement will be variable, but it is anticipated that it could be as high as the 100 psi range. Because this pressure requirement is expected to be similar to the PAR system requirement, the same pumps will be used with a control valve system.

The reclaimed water pumps will be vertical turbine pumps with VFDs which will provide flexibility to handle the pressure variations associated with the different RIB connection points and lower flows. The goal in the design of the pumps was to minimize the total number, while allowing the lower flows to be covered by the turndown provided by the VFDs. One standby pump will be available in all phases to provide reliability and to allow for firm capacity ratings.

For Phase 1, five pumps will be installed: two 250 HP pumps and three (2 duty 1 standby) 500 HP pumps. The firm capacity will be 30 MGD. The two 250 HP pumps will allow for turn down during the low flow conditions at startup and will eventually be replaced with larger pumps. With the use of automated valves, the pump station will be designed to pump reclaimed water to the PAR system or to the RIBs.

For Phases 2 and 3, a duplicate of this pump station will be built, with ten 500 HP pumps installed at the ultimate Phase 3 build out.

Table 26 summarizes the reclaimed water pump station design criteria. Drawing M-12 (Appendix A) shows a plan view of the reclaimed water/non-PAR water pump station.

Table 26. Reclaimed Water Distribution Pump Station Design Criteria

Parameter	Phase 1	Phase 2	Phase 3
Type	Vertical Turbine Pump with VFD	Vertical Turbine Pump with VFD	Vertical Turbine Pump with VFD
Number of Pumps	5 (4 duty / 1 standby)	7 (6 duty / 1 standby)	10 (9 duty / 1 standby)
Capacity (each)	5 MGD and 10 MGD	10 MGD	10 MGD
Head (approx.)	231 feet	231 feet	231 feet
Motor (each)	250 HP (2) and 500 HP (3)	500 HP	500 HP
Total Motor HP	**2000 HP**	**3500 HP**	**5000 HP**

3.12 Chemical Pumping Systems

3.12.1 Sodium Hypochlorite Metering and Storage

Since this is a new facility and effluent quality is not known, high level disinfection will be provided with the expectation of effluent containing greater than 1,000 and up to and including 10,000 fecal coliforms per 100 mL before disinfection. This requires the product of total chlorine residual used for design and the contact time at PHF of at least 40 mg-min/L per 62-600.440 F.A.C.

Sodium hypochlorite metering will be designed around using a duplex pump skid with dedicated duty pumps for each CCT with a swing stand-by pump for maintenance. The feed pumps will be hydraulically actuated diaphragm metering pumps and designed to provide a dose of 14 mg/L to the CCTs during PHF. Due to the degradation of sodium hypochlorite concentration over time, the storage tanks will be sized to store approximately 10 days of product at AADF conditions.

For Phases 1 and 2, two 3000-gallon storage tanks are recommended for redundancy during maintenance. The building will be designed to ultimately house three 6100-gallon storage tanks, and the tank structural pedestals will be designed for larger future tanks. The tanks will be vertical polyethylene tanks, either LLDPE or XLHDPE with low density liner, and the piping will be Schedule 80 PVC. Tank sizes are based on common manufactured volumes. The feed pumps will withdraw the sodium hypochlorite from one tank at a time, and the outlet of each storage tank will be manifolded together using an inverted suction manifold, so that the feed pumps have the ability to withdraw solution from any tank. The inverted suction manifold minimizes vapor lock, which can be problematic with sodium hypochlorite feed systems. The sodium hypochlorite will be fed to the two mixing zones at the head of the two chambers. Secondary feed points will be the RAS or the filter influent.

Table 27 summarizes the sodium hypochlorite metering and storage system for Phase 1 and for build out. Drawing M-13 shows a hypochlorite building.

Table 27. Sodium Hypochlorite Metering and Storage System Design Criteria

Parameter	Phase 1	Build-Out
Feed Points Required	2 (1 per CCT)	6 (1 per CCT)
For a CT of 40 mg-min/L – Residual of 1.67 mg/L at 15 minutes		
Dosage Rate (AADF)	12 mg/L	
Dosage Required (AADF)	500 gpd	1,500 gpd
For a CT of 40 mg-min/L – Residual of 2.67 mg/L at 15 minutes		
Maximum Dosage Rate (PHF)	14 mg/L	
Maximum Dosage Required (PHF)	864 gpd	2,592 gpd
Storage Requirements		
Minimum Storage Time	10 days	
Number of Bulk Solution Storage Tanks	2	
Minimum 10-Day Volume – 40 mg-min/L at AADF	5,600 gallons	17,500 gallons
Bulk tanker size	4,500 gallons	
Design Tank Volume (Total)	6,000 gallons (2 tanks x 3,000 gallons)	18,300 gallons (3 tanks x 6,100 gallons)
Tank dimensions	7’-1” D x 10’-6” H	8’-6” D x 16’-4” H
Days of storage provided – 40 mg-min/L at AADF	10.7	10.9
Pumping Requirements		
Number of Feed Pumps	2 (1 duty and 1 standby)	4 (3 duty, 1 standby)
Design Pump Rate at PHF	73 gph	73 gph

3.12.2 Metal Salt (Alum) Metering and Storage

Phosphorus removal can be achieved by chemical precipitation or by EBPR. With the 5-stage Bardenpho process, EBPR is expected to be the primary phosphorus removal mechanism and modelling indicated that targeted effluent phosphorus concentrations could be achieved by EBPR alone. However, since this is a new facility where the influent quality has been estimated based on sampling at other OCU facilities and to provide supplemental phosphorus removal in the event of a disruption to the EBPR process, a backup system of chemical precipitation is recommended. Chemical precipitation is usually carried out by

addition of mineral (aluminum or iron salts) or lime. Alum ($Al_2(SO_4)_3$-$14H_2O$) is most commonly used as a source of aluminum and is recommended for use at the HWRF.

To increase the efficiency of chemical removal of phosphorus, alum is typically introduced in the reaeration basins or prior to the secondary clarifiers; for the Hamlin WRF alum will be introduced upstream of the clarifiers. In accordance with PAR rule 62-610.460, which requires chemical feed facilities for coagulant, coagulant aids, or polyelectrolytes to enhance pathogen removal at the filters, alum will also be introduced prior to the filters; this will also serve as a back-up feed location for chemical removal of phosphorus. A 1.75 molar ratio (Al:P) was used to calculate the dosage required to reduce the TP levels by 1.0 and 1.5 mg/L at MMF to size the metering and storage systems with 5.0 mg/L used as the requirement during an upset scenario where biological phosphorus removal was completely lost.

Due to the unknowns related to the construction of a new WRF such as influent quality and basin performance, the alum metering and storage system will be implemented in phases. The start-up phase will consist of slab on grade with metering skids and IBCs mounted on top of polyethylene secondary containment spill pallets. IBCs are typically manufactured in 275 and 330-gallon sizes. During start-up, three (3) 275-gallon IBCs would provide the capability to trim 1.5 mg/L of TP at the MMF peaking factor for approximately 9 days at startup flows. Additional IBCs, if needed, can be obtained within a relatively short time period. Alum metering will be designed using a quad pump skid (3 duty pumps and 1 standby). The feed pumps will be hydraulically actuated diaphragm metering pumps.

Once the facility is in operation, chemical needs for supplemental phosphorus removal will be reassessed and a more permanent structure with storage tanks will be installed, if necessary, based on updated design criteria. Space has been allocated on site for such a facility. Storage capacity will be in accordance with the Nutrient Control Design Manual (EPA, August 2010) which recommends providing total storage capacity at least 1.5 times the largest anticipated shipment and providing at least a 10-day to 2-week supply at the maximum monthly flow dose.

Proper mixing is required at the dosing point and can be achieved with a flash mixing basin or a static mixer. Table 28 summarizes the alum metering and storage system at Startup. Drawing M-14 shows a plan of the alum storage and feed system at startup.

Table 28. Alum Metering and Storage System Design Criteria

Parameter	Start-Up
Feed Points Required	Upstream of Clarification and Filtration
Product	48.5% alum (4.3% aluminum) liquid by weight
Storage Time at Startup	9 days (based on 1.5 mg/l trim at max month conditions)
Design volume at Startup	825 gallons

Parameter	Start-Up
Delivery Size	275 gallons (each IBC)
Number of IBCs	3
Design Tank Volume (Total)	825 gallons (3 IBCs x 275 gallons)
Number of Feed Pumps	3 (3 duty and 1 standby)
Design Pump Rate at 1.0 mg/L, AADF	4.8 gph
Design Pump Rate at 1.5 mg/L, MMF	9.4 gph
Design Pump Rate at 5.0 mg/L, MMF	24 gph
Minimum pump capacity, gph	0.04
Maximum pump capacity, gph	15

3.12.3 Supplemental Carbon System

Based on the results of the treatment process modeling using BioWin™, supplemental carbon is recommended for the HWRF to meet the effluent total nitrogen permit requirements. The BioWin™ model estimates a 1,436 lb/day deficiency of COD per basin at MMF or approximately 145 gpd of methanol. A supplemental carbon feed system consists of product storage and chemical metering skids for pumping the product to the final post anoxic zones as a food source for denitrifying bacteria.

OCU conducted a supplemental carbon alternatives and present worth analysis in 2011 to determine the effectiveness of EOS MicroC™ 2000 and acetic acid (20% solution) as alternatives to methanol for the EWRF Phase V Improvements project. The result of the study was to sole source EOS MicroC™ 2000 based on lower 10-year present worth analysis, increased safety and reduced required storage volumes. Since MicroC™ 2000 has a slightly lower COD content than methanol (1,040,000 mg/L vs 1,188,000 mg/L), a slightly higher dosage is required per basin (166 gpd vs. 145 gpd).

Supplemental carbon metering will be designed around using a triplex pump skid for pumping to both process basins. The triplex skid will provide a dedicated pump to each basin with a swing stand-by for maintenance. The feed pumps will be peristaltic hose pumps and be sized for MMF dosing.

Similar to the alum metering and storage system, the supplemental carbon metering and storage system will be implemented in phases. The start-up phase will consist of slab on grade with metering skids and IBCs mounted on top of polyethylene secondary containment spill pallets. IBCs are typically

manufactured in 275 and 330-gallon sizes. During start-up three 275-gallon IBCs are required to provide 12.5 days of storage based on the MMF peaking factor. Once the facility is in operation and denitrification performance can be evaluated, carbon needs for will be reassessed and a more permanent structure with storage tanks will be installed, if necessary, based on updated design criteria. Space has been allocated on site for such a facility. Storage capacity will be in accordance with the Nutrient Control Design Manual (EPA, August 2010) which recommends providing total storage capacity at least 1.5 times the largest anticipated shipment and providing at least a 10-day to 2-week supply at the maximum monthly flow dose.

Table 29 summarizes the supplemental carbon metering and storage system using MicroC™ 2000. Drawing M-15 shows a plan of the alum storage and feed system at startup.

Table 29. Supplemental Carbon Metering and Storage System Design Criteria

Parameter	Start-Up
Feed Points	2 (1 per train)
COD Required (MMF)	575 lb/day
Dosage Required (MMF)	66 gpd
Product	MicroC™ 2000
Storage Time at Startup	12.5 days (based on max month conditions at startup)
Design volume at Startup	825 gallons
Delivery Size	275 gallons (each IBC)
Number of IBCs	3
Number of Feed Pumps	3 (2 duty and 1 standby)
Design Pump Rate, AADF	5.4 gph
Design Pump Rate, MMF	7.0 gph
Minimum pump capacity, gph	0.04
Maximum pump capacity, gph	10

3.13 Sludge Holding Tanks

3.13.1 Sludge Holding Tanks

For Phase 1, OCU intends to thicken solids at the HWRF and transport to SWRF for additional processing. As flows to the WRF increase in future phases, OCU anticipates dewatering solids on site and space has been allocated for a future dewatering building. Four SHTs are proposed in Phase 1: two SHTs for WAS storage prior to thickening and two for thickened sludge storage post gravity belt thickening and prior to truck loading and disposal. All SHTs will have the ability to store WAS. As OCU moves to dewatering of sludge in future phases, there will no longer be a need for thickened sludge storage and all four SHTs would be used for WAS storage. At buildout capacity in Phase 3, there will be 6 SHTs for WAS storage.

WAS removed from the secondary clarifiers will be routed to the SHTs which will be equipped with a coarse bubble diffused aeration system. The SHTs will aerate, store and thicken (as needed via decanting) the WAS before thickening by GBTs. The projected maximum month WAS production rate at a

plant capacity of 5 MGD is about 160,000 gpd at a solids concentration of 0.8% TS at 20 °C. Two WAS holding SHTs will provide 4 days of storage capacity under maximum month conditions, which results in a total storage capacity of about 640,000 gallons. Under average WAS production rates, the tanks will provide a total of about 4.5 days of storage. Storage capacity is increased if sludge is thickened via decanting – up to 7.5 days under maximum month conditions if sludge can be thickened by decanting to 1.5%. Because the SHTs used for thickened sludge storage will eventually be used for WAS storage only, all SHTs will be the same size and layout, except that the thickened sludge SHTs will also have provisions to accept thickened sludge and feed to the truck loading station. If all four SHTs are used for WAS storage, the total capacity will be 1,280,000 gallons. Assuming that the sludge is thickened in the GBTs to 3%, thickened sludge storage will be 15 days at maximum month conditions.

The SHTs will be above ground concrete structures with an engineered cover system and activated carbon adsorber single stage odor control system to mitigate potential odors which may impact nearby recreational facilities. The four SHTs will be rectangular with common wall construction. Each storage tank will be 90-feet long by 40-feet wide with a side water depth of 12 feet. Aeration and mixing for the tanks will be provided by wide band coarse bubble diffusers and positive displacement blowers. Six blowers will be provided; three blowers for each set of SHTs for WAS and thickened sludge storage, respectively, with one blower for each SHT and the third blower serving as back-up to either tank. The design basis for the aeration and mixing systems is 30 scfm per 1,000 CF of tank volume as recommended in Ten States Standards. This is a typical aeration rate for effective mixing with coarse bubble diffusers. The air required for mixing of the tanks is higher than the process requirements for air.

The SHTs will be operated in batch mode. Each tank can be filled, aerated, settled, and decanted to increase the solids concentration. The air supply will be periodically turned off to allow solids to settle. Upon settling, clarified supernatant will be decanted from the tank and recycled to the head of the plant. Decanting will be accomplished with motorized telescoping valves, and scum baffles will be provided. Once the sludge reaches the desired solids content, the thickened WAS will be pumped to the thickening facility.

The design criteria for the sludge holding tanks are summarized in Table 30. Drawing M-16 (Appendix A) shows a plan of the SHTs.

Table 30. Design Criteria for Sludge Holding Tanks

Parameter	Phase 1
Storage Tanks	
WAS Flow (gpd), MMF	160,000
WAS Concentration (%)	0.8
Type of Tank	Above ground cast-in-place concrete
Quantity	4
Length (ft)	90
Width (ft)	40
Side Wall Depth (ft)	13

Parameter	Phase 1
Side Water Depth (ft)	12
Volume (each tank) (gal)	320,000
WAS Storage	
Total Storage Capacity (gal)	620,000
Total Storage Capacity (days), 0.8%	4 (Max Month Conditions)
Thickened Sludge Storage	
Total Storage Capacity (gal)	620,000
Total Storage Capacity (days), 0.8%	15 (Max Month Conditions)
Mixing System	
Aeration Rate (scfm/tank)	1,296
Type of Diffuser System	Wide band coarse bubble
Number of Blowers	6
Type of Blower	Positive displacement blower with variable frequency drive
Blower Design Capacity (scfm/blower)	1,296
Blower Discharge Pressure (psig)	6.5
Decant System	
Telescoping Valves (in)	6
No. Telescoping Vales in each tank	2
Thickened Sludge Feed Pumps to Truck Loading	
Design Feed Sludge Concentration (%)	3
Maximum Feed Sludge Concentration (%)	6
Design Sludge Feed (gpm)	175
Maximum Sludge Feed (gpm)	250
Number of Units	2 (1 duty, 1 standby)
Capacity per Pump (gpm)	250 @ 60 psi
Motor Size (HP)	20

3.13.2 SHT Odor Control

Because of the proximity to an anticipated recreational facility south of the HWRF, the SHTs will be covered to contain and treat odors. The area below the aluminum SHT covers needs to be ventilated to

protect the concrete and other mechanical equipment. Due to the batch type process of the tank operation and the anticipated low level of odor constituents (based on sampling at the NWWRF SHTs), carbon adsorbers are the chosen odor control technology.

Carbon adsorbers are typically designed based on velocity, pressure drop and loading capacity. A dual bed carbon adsorber can handle an airflow of 12,400 cfm, which equates to a bed velocity of 55 feet per minute. An arrangement of three 9-feet diameter dual bed adsorbers ducted in parallel sized for half capacity (6,200 cfm each) with a dedicated fan per adsorber will be provided. This configuration will provide redundancy and allow for a unit to be down for maintenance (i.e. carbon replacement) while always maintaining the system in full operation. The third unit might also be sufficient ventilation and odor control for the ultimate build-out. The design basis for the odor control system are summarized in Table 31. Drawing M-17 (Appendix A) shows a plan of the SHT Odor System.

Table 31. Sludge Holding Tank Odor Control System Design Criteria

Parameter	Design Criteria
Cover for SHTs	Engineered aluminum cover system supported from floor
Cover Area per SHT (SF)	3600
Cover Foul Air Flow per SF	½ cfm / SF
Cover Foul Air Flow per SHT (scfm)	1800
Cover Foul Air Flow per 4 SHTs (scfm)	7200
Aeration Rate per SHTs (scfm)	1296
Total Aeration Rate for 4 SHTs (scfm)	5184
Air Changes / Hour / SHT	4.7
Total Odor Control Volume (scfm)	12,400
Activated Carbon Adsorber	Virgin Activated Carbon
Minimum Bed Depth (ft)	3
Carbon Bed Maximum Face Velocity (ft/min)	55
Carbon Bed Minimum Empty Bed Retention Time (seconds)	3

3.14 Thickening

Sludge from the WAS SHTs will be pumped to a thickening facility to be thickened via gravity belt thickeners and sent to the SWRF for additional processing and eventual disposal. GBTs were selected as they are used for thickening at other OCU WRFs. As noted in Section 3.13, as flows to the WRF increase in future phases, OCU anticipates dewatering solids on site and there will no longer be a need for the

GBTs. Therefore the GBTs are signed to accommodate Phase 1 only. Thickened sludge will be pumped to the thickened sludge SHTs and from pumped to a truck for transport to SWRF.

Two, 3 meter, 350 gpm GBTs (one duty and one standby) will be provided. The GBTs were sized to limit operations to one shift per day during the week. Each GBT has a feed pump, hydraulic drive and washwater booster pump, polymer activation metering unit and polymer storage, and thickened sludge pump.

Table 32 summarizes key design criteria for the GBTs. A layout of the GBT facility is shown in Drawing M-18 (Appendix A).

Table 32. Design Criteria for GBT Thickening

Parameter	Design Criteria
Sludge Feed Pumps	
Design Feed Sludge Concentration (%)	0.8
Maximum Feed Sludge Concentration (%)	3
Design Sludge Feed (gpm)	350
Maximum Sludge Feed (gpm)	450
Number of Units	2 (1 duty, 1 standby), with VFD
Capacity per Pump (gpm)	450 @ 40 psi
Motor Size (HP)	40
GBT	
Number of Units	2 (1 duty, 1 standby)
Min. Effective Belt Width per Unit (m)	3
Unit Average Solids Throughput Capacity (lb/hr/m)	467
Unit Maximum Solids Throughput Capacity (lb/hr/m)	600
Anticipated Feed Rate (gpm)	350
Minimum Solids Capture	95 percent
Maximum Polymer Usage at Maximum Solids Throughput	10 active lb / dry ton
Belt Drive Unit Motor Size (HP)	3
Hydraulic Pump Motor Size (HP)	1
Polymer Feed System	
Maximum Polymer Solution Preparation Rate (gal/hr)	5
Maximum Dilution Water Rate (gpm)	40
Design Sludge Loading Rate (dry lbs/hr)	1400

Parameter	Design Criteria
Design Polymer Dose Requirement (active lbs/dry ton)	8
Design Polymer Dose Requirement (active lbs/hr)	5.6
Design Neat Emulsion Polymer Strength (% active)	35-50
Number of Polymer Mixing and Blending Units	2 (1 duty, 1 standby)
Polymer Storage	Bulk Totes (1 per skid)
Thickened Sludge Feed Pumps	
Design Feed Sludge Concentration (%)	3
Maximum Feed Sludge Concentration (%)	6
Design Sludge Feed (gpm)	56
Maximum Sludge Feed (gpm)	120
Number of Units	2 (1 duty, 1 standby), with VFD
Capacity per Pump (gpm)	120 @ 60 psi
Motor Size (HP)	20

4 CIVIL / SITE DESIGN CRITERIA

4.1 Existing Site Conditions

The existing HWRF project site is approximately 50 acres in size and consists of unimproved open land with undulating surface topography ranging from a high elevation of 131.8 feet to a low of elevation 97.0 feet (NAVD). The current ground cover is generally grassed pasture land with a scattering of oak trees. There are no existing water bodies on the site and according to FEMA Flood Insurance Rate Map (#12095C0380F), the entire site is located within Flood Zone X.

Two abandoned rapid infiltration basins (RIBs) are located on the west side of the site, adjacent to SR 429. Other active RIBs exist on off-site property near the middle and east sides of the site.

Drawing C-1 (Appendix A) shows an aerial of the existing site with contours. The location of anomalies, identified in the Preliminary Geotechnical Report (Appendix D) as having loose soils and the potential for sinkhole formation, are also shown.

4.2 Proposed Site Plan

As part of TM No. 8 “Site Master Plan” (Appendix C), the site was master planned to incorporate the major processes and equipment required for Phases 1 to 3. Several factors were considered in the development of the site plan, shown in Drawing C-2 (Appendix A), although given the tight site at buildout

in Phase 3 some compromises were made. These are summarized below and described in further detail in TM No. 8.

- The site footprint as well as the process and hydraulics sequence of the major process and equipment components.
- Leaving room for future phases and other processes that may be considered by OCU beyond Phase 3 or should regulations change, requiring additional treatment.
- Keeping similar structures together and arranged in such a manner as to more easily balance flow and minimize piping.
- Allowing visibility of the main site entrance from the SCADA room of the Administration Building.
- Preservation of significant existing trees on site, especially the larger, older trees.
- Constructing large and/or critical structures away from the anomalies (loose soil and high potential for sinkhole formation) identified in the geotechnical investigations (Appendix D). Where this was not feasible, construction in these areas was delayed to later phases.
- Locating structures such that process components with higher odor potential were located away from the southern section of the HWRF site. These will minimize the offsite odor impacts to the planned recreational facility expected to be located south of the HWRF facility.
- Laying out roads to allow access to the proposed structures for operations and maintenance, and collection of residuals (screenings, grit, and biosolids). The main access to the HWRF will be to the north of the site, at the intersection of Mann Road and Old Malcolm Road. There will also be an entrance to the south of the facility that will be restricted to OCU operations staff to keep major facility traffic away from the planned recreational facility.
- Input from operations staff was provided and incorporated into the development of the site plan.

Preliminary assessments revealed that there were no wetlands contained within the project site, but there was evidence of the presence of gopher tortoises and sand skinks, which would not be possible to avoid. Appropriate measures will be taken to relocate or mitigate the impacts on the impacted species of concern, as discussed in Section 1.3.5.

4.3 Pavement and Roadways

New internal 24-foot wide roadways will be constructed to provide access to the new facilities. It is anticipated that the roadway design will include 2 to 3-inches of asphaltic concrete wearing surface over 10-inches of crushed concrete or limerock base, and a 12-inch stabilized subgrade. Horizontal geometry for the internal roadways will provide adequate turning radii to accommodate delivery, emergency and maintenance vehicles.

4.4 Grading

A plan will be prepared to delineate the earthwork and site grading modifications necessary to properly set the elevation of plant buildings, structures and equipment. Also, proposed grades and contours will be shown for paved areas, roadways and open space to properly direct surface water runoff to components

of the stormwater management system. Site grading will be designed to provide a reasonable balance of cut and fill.

4.5 Yard Piping

Piping for the improvements will be placed underground wherever possible. All pipe and fitting joints shall be restrained. Pipe materials for the different utility services are described in Table 33.

Table 33. Piping Materials

Service	Size Range	Material
Force Main	All	PVC (C 900)
Raw Sewage	<= 3”	Carbon Steel (Schedule 80)
Raw Sewage	> 3”	Ductile Iron (Ceramic Epoxy Lined)
Mixed Liquor, NRCY/IR	All	Ductile Iron (Ceramic Epoxy Lined)
Secondary Effluent	All	Ductile Iron (Ceramic Epoxy Lined)
RAS/WAS, TWAS	All	Ductile Iron (Ceramic Epoxy Lined)
Filter Effluent	All	Ductile Iron (Ceramic Epoxy Lined)
Reject	Exposed	Ductile Iron (Ceramic Epoxy Lined)
Reject	Buried	Ductile Iron (Cement Mortar Lined)
Reclaimed Water	<= 3”, exposed	Carbon Steel (Schedule 80)
Reclaimed Water	<= 4” buried	PVC (Schedule 80)
Reclaimed Water	4” – <12” buried	PVC (C900)
Reclaimed Water	> 3” exposed, >= 12” buried	Ductile Iron (Cement Mortar Lined)
Decant, GBT Overflow	All	Ductile Iron (Ceramic Epoxy Lined)
Backwash Water	All	Schedule 80 PVC
Drain	<= 3”	Carbon Steel (Schedule 80)
Drain	> 3”	Ductile Iron (Ceramic Epoxy Lined)
Scum	All	Ductile Iron (Ceramic Epoxy Lined)
Sump Pump Discharge	All	PVC (Schedule 80)
Seal Water	All	Carbon Steel (Schedule 80)
Grit	All	Ductile Iron (Glass Lined)
Air	All	316 Stainless Steel
Alum	All	PVC (Schedule 80)
Carbon (MicroC)	All	PVC (Schedule 80)
Sodium Hypochlorite	All	PVC (Schedule 80)

Polymer	All	PVC (Schedule 80)
Potable Water	<= 3", exposed,	Brass (Schedule 40)
Potable Water	> 3", exposed; <= 4" buried	PVC (Schedule 80)
Potable Water	>4" buried	PVC (C900)
Storm Sewer	15" – 42"	Reinforced Concrete

4.6 Stormwater

4.6.1 Existing Conditions

The existing topography of the site creates approximately eight (8) on-site drainage sub-basins. The sub-basin at the southwest corner of the site drains to a low area that borders the south property line. The sub-basin at the southeast corner of the site drains to a low area that borders the east property line. A large sub-basin extending along much of the south property line drains water southward off-site to an existing pond, approximately 150 feet south of the HWRF south property line.

The other sub-basins internal to the site all drain to self-contained low areas within their respective basins. There are areas along the north, middle and east sides of the project site that contribute approximately 15.3 acres of off-site surface runoff onto the HWRF site. The top surface areas of the existing RIBs are self-contained and do not contribute surface runoff to the site.

There are two existing off-site stormwater ponds that were constructed as part of the Central Florida Expressway Authority's SR 429 project. These ponds are designed to fully retain the 100-year, 24-hour storm event. However, both ponds have 6-inch emergency orifice devices that can be opened to alleviate the pond flooding in the case of an emergency. Discharge from these orifices is directed onto the HWRF site.

These ponds are designated as Ponds Nos. 2B and 3 in the SR 429 plans and corresponding drainage report. Pond No. 2B is a 10.7 acre pond located adjacent to SR 429 near the southwest corner of the HWRF site. Pond No. 3 is a 10.5 acre pond located on the north side of Malcolm Road, east of SR 429.

See Drawing C-3 (Appendix A) for a map delineating the Existing Drainage Conditions.

4.6.2 Soils

The USDA SCS Soil Survey of Orange County, Florida indicates that almost the entire project site resides within Candler Fine Sands mapping units. These sands are described as well-drained and excessively-drained soils with a depth to the high water table of 6 feet or greater. These soils fall within Hydrologic Soil Group A with Unified Classifications of type SP and SP-SM.

Field permeability tests performed in each pond by Antillian Engineering Associates, Inc. resulted in values of coefficient of horizontal permeability at between 26 feet per day and 40 feet per day. Groundwater was encountered at depths between 0 and 23 feet below the existing grade.

It should be noted that on-site groundwater elevations are heavily influenced by the operation of the adjacent RIBs. Historical monitoring well information was obtained from Water Conserv II for review to help estimate a seasonal high water table elevation for each proposed stormwater pond. The highest recorded groundwater elevation in the monitoring wells closest to each pond location will be utilized as the seasonal high-water elevation for stormwater pond modeling.

4.6.3 Proposed Conditions

Although the HWRF will be phased to meet future wastewater demands, pond sizing will be developed to accommodate future build-out. Given the excellent soil permeability and adequate area on-site available for stormwater pond construction, the additional storage required to account for future expansion is not a significant factor in the pond sizing. It is estimated that the proposed improvements at full site build-out will add approximately 606,000 sf (13.9 acres) of impervious surface area to the site. For stormwater calculation purposes, this total does not include the area of the clarifiers, chlorine contact tank, reject pond, and activated sludge treatment trains. These facilities are open to the atmosphere and will not contribute any surface runoff to the site during rainfall events.

In the proposed conditions, the HWRF site will be divided into three major drainage basins with one stormwater pond located in the existing low area of each basin. The proposed ponds are located in existing low areas in order to make use of the natural topography and to minimize the need for extensive excavation. Pond A is located in the southwest corner of the site; Pond B is located in the middle of the site, and Pond C is located in the southeast corner of the site. Routing of stormwater runoff to the ponds will be accomplished by incorporating a system of inlets, storm pipes, curb & gutters, swales, surface grading and sloped paving.

4.6.4 Stormwater Design Criteria

The HWRF project site is situated within the geographical boundaries of the South Florida Water Management District (SFWMD). Normally, SFWMD would have jurisdiction over a project within these boundaries for State stormwater permitting. However, since the stormwater component for this project is associated with the construction of a wastewater treatment facility, the FDEP is delegated with this authority and will review the Environmental Resource Permit (ERP). FDEP will utilize the SFWMD permitting requirements as the basis of design criteria. Orange County also has jurisdiction over the development, and stormwater permitting will also meet the County's criteria.

The site resides in closed drainage basin, and therefore, the proposed stormwater ponds will be designed as zero-discharge ponds. Pre-application meetings and telephone discussions were held with Orange County, SFWMD and FDEP permit review staff, and the following stormwater design criteria will apply.

See Figure 4 for a map delineating Proposed Drainage Conditions.

Figure 4. Proposed Drainage Conditions

4.6.4.1 Orange County

The 25-year, 24-hour storm (8.6 inches of rainfall with Orange County rainfall distribution) is the “Design Storm”. Ponds must contain the runoff from a 25-year, 24-hour storm event with 1 foot of freeboard to the lowest top-of-bank elevation. For modelling, infiltration cannot begin until after the storm event ends (Hour 25). The pond must recover within 14 days following the storm event, or a second 25-year, 24-hour storm must be stacked on the remaining pond volume and contained within the top-of-bank with 1-foot of freeboard maintained.

Ponds must contain the 100-year, 24-hour storm event (10.6 inches of rainfall with Orange County rainfall distribution) within the lowest top-of-bank elevation (no freeboard required). An allowable infiltration rate of 12.5 feet per day (max.) may begin at Hour 0 for this analysis. The 100-year, 24-hour storm pond volume must recover within 14 days. If full recovery is not achieved within 14 days, a second 100-year, 24-hour storm must be run and “stacked” on top of the resulting pond volume elevation ending at the 14-day period. The pond must fully contain this second storm event; however, no freeboard will be required.

The maximum rate of horizontal conductivity (Kh) shall be 12.5 feet per day. This Kh value is not published in the current County code but will be codified by the County in the near future. Per code, the minimum vertical dimension from the seasonal high-water elevation to the proposed dry pond bottom is 3 feet. However, a variance/waiver can be requested to reduce this dimension to 1 foot. Ponds with slopes steeper than 1:5 (1 vertical: 5 horizontal) must be fenced. However, a variance/waiver can be requested at the time of submittal for this requirement to be waived.

4.6.4.2 SFWMD

For on-site retention, the ponds shall hold the post-developed runoff volume for the design storm, which is the Orange County 25-year, 24-hour event. Buildings must be above the 100-year, 72-hour storm (SFWMD 72-hour rainfall distribution) elevation. Roadways must be above the 10-year, 24-hour storm (FL Modified rainfall distribution) elevation. Dry retention ponds shall be sized to hold 150% of the WQTV. As a rule-of-thumb, WQTV volume shall recover within 72 hours and the design storm volume shall recover within 14 days following the storm event. Dry pond bottoms must be a minimum of 1 foot above the average wet season water table elevation.

4.6.4.3 FDEP

The SFWMD stormwater system pond design will be utilized for the design criteria. Ponds must recover the WQTV within 72 hours following the storm event. The highest recorded monitoring well elevations for seasonal high water elevations will be used.

4.7 Landscaping

4.7.1 Existing Conditions

A preliminary ecological assessment of the project site was conducted by GAI (formerly Lotspeich and Associates, Inc. in 2013). The findings of this assessment is summarized in TM No. 2 “Environmental Investigation Site Findings”, dated March 2014. The assessment identified that the original ecosystem to

the site prior to human development was likely Sandhill. Per the Florida Association of Native Nurseries, the Sandhill ecosystem is described as the “high rolling savannah of Florida marked by longleaf pines, grasses, and abundant wildflowers”, occurs on deep, well-drained yellow sands with few and little organic matter. Like flatwoods, sandhill burns every 1-5 years, preventing hardwood succession.

The Sandhill ecosystem, now a very rare native landscape, is located on well drained sand that has the important natural function of aquifer recharge. Water drains into the soil with very little runoff or evaporation. True Sandhills depend on fire every few years, but this essential element is deprived on sites occupied by humans. Sandhills without fire evolve into xeric oak hardwood hammocks. Sandhills have rare and unique flora and fauna species interrelationships. Very few Sandhills are left in Central Florida. Both Federal and State designated threatened and endangered species live in Sandhills, and their specific habitats are similar to this site. The survey found evidence of several gopher tortoise burrows and sand skinks on the site. Preservation of some groups of trees and native vegetation could continue to provide habitat for such species.

Existing Native Florida trees found on the site, which are typical of tree species found in Sandhills, described in TM No. 2 includes:

- Quercus virginiana, Live Oak
- Quercus geminata, Sand Live Oak
- Quercus laevis, Turkey Oak
- Quercus stellata var. margarettae, Sand Post Oak
- Pinus elliottii, Slash Pine (a few individuals)
- Prunus serotina, Black Cherry
- Sabal palmetto, Cabbage palm (a few individuals)

Usually the dominant tree species are Slash Pines and Turkey Oaks. Live oaks become more prevalent than pines when seasonal fire is suppressed. The Understory is primarily comprised of a variety of grasses but also includes spotty individual specimens of:

- Serenoa repens, Saw Palmetto
- Rhus copallinum, Winged Sumac.

4.7.2 Landscape Approach

Florida Statute 373.185 of 2009, “The Florida Friendly Landscape Law” requires local government to adopt codes to conserve water used on landscapes.

The proposed installed landscape for the HWRF will primarily be in proximity to the Administration Building and to the perimeter of the site. Preserved trees can help to provide shade relief around the facility, stormwater abatement and satisfy green building requirements. The design is based on the assumption that all utilities are underground and allowances will be made for tree root growth. Plants will be grouped according to their drought tolerance and soil moisture categories as listed in the Florida Friendly Plant List. The general landscape design is as follows:

- For the overall site, landscape will be very limited. Turfgrass and sod will be installed to provide land cover. Trees may be installed to provide shade in some areas and shrub areas may be needed for screening of utility areas or as wind breaks. Shrubs, vines and trees with pleasant scents can be used to mask unpleasant odors.
- A retaining wall will be needed along the east side of the Administration and Maintenance Buildings against a steep slope. Landscaped areas will be included between and around the structures and pavement.
- The site landscape development around the building will include trees for shading and cooling, low groundcover and shrubs along the foundation walls of the buildings and at the entrance per Orange County Landscape Code, and groundcovers and shrubs to direct pedestrians to the paths plus screening of service areas. Sod will be needed around the building outside of landscape beds. Irrigation will be from reclaimed water per Orange County code and will be needed in the planting areas around the Operations Building. Per Orange County Landscape Code, perimeter building landscape treatment is applied to the “primary façade” or building front to a depth of eight feet. One shade tree is planted for each 25 feet, or one understory tree / three palm trees per 15 feet of the façade. A low hedge to grow to 30” tall is to be placed along at least 50% of the front façade. This standard is not required for County facilities, but it is recommended that some landscape material be installed.
- Trees will be preserved or planted in parking lot islands and along the perimeter of parking areas. Sec. 24-4 of the Landscape Code requires trees along the perimeter within a green strip. The code requires a maximum of ten (10) continuous parking spaces then a landscape island must be placed to break up pavement. The landscape island shall be a minimum of eight (8) feet in length and eight (8) feet in width and include one (1) shade tree of an acceptable species, two if double row of parking. No turf may be used in islands, but groundcovers are acceptable. Trees may also be planted along other driveways to provide shade. Shade trees will reduce heat gain of pavement and walls and cool the air.
- Buffer areas will be provided along the southeast, south and southwest boundaries of the site. The buffer will be combined with a security fence. Because a new street and highly active public park is proposed adjacent to the site to the south, although not required by Orange County Code Section 24-5, OCU prefers to separate and screen the facility from the public park areas with bamboo trees.
- The site will be closed off with a fence at least 6 feet in height, accessed via locked gates from Malcom Road and secondarily from the new park road, tentatively known as Hamlin Trail. These gates will require some vegetation to help indicate, restrict and direct access but not block visibility. Landscape materials can help to define public areas from secured areas but will not be placed to block visibility of security gates within the site. Clear sight lines will be considered at intersections of driveways. Landscaping along the perimeters as described above will also enhance security.

4.7.3 Trees

4.7.3.1 Tree Preservation

There are several groups of large trees on the site. Figure 4 also shows the location of trees on the existing site. Areas in the northeast and in the southwest corners of the site have tree groups that every effort will be made to preserve. In some cases the layout of the roads and structures, as well as the location of the main entrance, was done with the intent of preserving trees of significant size. However, the locations of large structures will require flattening the hills and filling the valleys thus destroying some trees. A sensitive grading design of the site maximize the number of trees that can be retained. Facilities, buildings, grade changes and pavement should not encroach within the drip line of these saved trees.

Orange County has a tree protection ordinance, Section 115 Article VIII and tree removal permits are required in order to remove trees. Tree removal permits can be combined with land clearing permits. Land Clearing is prohibited without a permit and a development plans must be approved by the County before a lands clearing permit can be processed. In that code section, the removal of any tree or land clearing shall also require adequate wind and water erosion control measures as well as compliance with county codes. The County has tree protection zones along the perimeter of a site varying in width depending on acreage.

Reasonable efforts will be made to preserve specimen trees as defined in the code, primarily live oak and magnolia trees twenty-four (24) inches DBH or greater. The Zoning Manager has to review an application for removal of a specimen tree. If approved for removal by the Zoning Manager, specimen trees shall be replaced at a ratio of two to one of the cumulative caliper of the trees to be installed to the cumulative caliper of the trees removed. At least half the replacement canopy trees must be 3” or larger caliper trees.

The permittee must ensure that any tree or stand of trees designated to remain is protected with fencing or barriers at the drip line (edge of tree canopy) during construction. Barriers for the protected trees shall be in place prior to any land clearing on the site. All preserved trees shall have their natural soil level maintained with no cut or fill within the drip line and no parking or materials storage within the protection zone. An accurate certified tree survey by a licensed Florida land surveyor will be prepared for the final design to prepare tree removal and protection plans to submit for permitting and for construction documents.

4.7.3.2 New Trees

New trees are not proposed to be added to the interior of the site other than the admin building, parking areas and for screening but more may be needed. Some canopy trees are recommended along the interior road system for shade relief but these must have space to grow. When locating piping, it is recommended to avoid utility conflicts with existing and proposed tree locations and to consider where future trees are desired. Most trees require plenty of irrigation to become established but after that will require little additional watering. Some trees can be added without irrigation, using watering–bag products such as Tree Gator or similar techniques.

Plantings around the Administration Building are shown in the landscape concept plan to have some canopy trees along the main driveway and parking lot and strategically elsewhere to provide shade to the buildings, especially from the west to reduce heat gain. A few understory trees are proposed near the

northern corners of the building and around the patio. These trees will soften the scale of the building, add visual interest and shade for the patio during morning and noon break times. Some low shrubs and groundcovers are proposed around the west building wall perimeter and near the entrance.

Canopy trees are proposed in the parking area to meet code and provide shade. Existing large oak trees are proposed to be preserved to the east of the maintenance building plus new trees will be added for shade.

4.7.4 Plants

The landscape approach is to replicate a native Florida sandhill, a low water use ecosystem, on the hill tops and to transition to moderate to high water use plantings in the drainage areas as appropriate.

Plants native to sandhills and xeric uplands will be selected. Native plants take less care, water, fertilizer and pesticides. No invasive exotic plants are on the site. The planting palette will provide visual interest during each season. Plantings will provide habitat for a variety of species. The planting mix may vary with the elevation changes. The landscape will demonstrate a low water use planting design for reclaimed water irrigation. Lawn areas will be limited and thus water needs. Low water use plants will be preferred for dry areas. Trees will be used to provide shade on the south and west sides of buildings, reducing heat gain and energy costs.

Sandhill is a fire dependent ecosystem and fire is not desirable for the facility, so an adapted plant list will be formulated to limit plant species that are prone to fires. Instead, a “fire wise” approach to planting will be taken. Lightening is prevalent in the high hilly ridges in Florida. This site is a potential lightening target and a lightning strike could ignite a vegetation fire.

Chapter 24 of Orange County’s code requires that landscape materials are to be installed on development sites. The landscape design for the HWRF will primarily be functional in nature, with landscape material used to garner LEED points and address code requirements. Trees will be preserved where feasible.

The Orange County Tree Protection code includes a list of preferred retained trees in Section 15-283. There are several of these species on the site, including valuable live oaks. Orange County also has a preferred plant list for new plantings which shows the water need categories of plants from high to medium to low.

Groundcovers help to limit water use compared to turf. Turf grass will be bahia, which is less thirsty than St. Augustine. Non-native plants may be selectively added to the plant list for specific applications such as a neat, compact groundcover. Non-native plant may also be used to provide a pleasant scent masking odors from wastewater treatment. Plants are to be grouped with plants of similar water needs based on the drought tolerance and soil moisture categories listed in the Florida Friendly Plant List to be consistent with F.S. (2009) § 373.185(1)(b). High water use plants are to be limited to 20% of the plants used.

As the site is located in a lightening prone area within a dry, fire-oriented ecosystem, plants that could catch and spread fire on a site should be avoided. Plant material will be zoned such that the least risky is closest to humans and buildings and plants will be kept low and tree limbs trimmed up at least 15 feet away from building roofs. Plantings should not be allowed to grow tall, dense, and layered into thickets.

Pines are to be spaced widely and branches trimmed up. Irrigation is necessary to keep plantings and soils moist during drought and times of high fire danger.

4.7.5 Bufferyards

Bufferyards will be along the North and northwest property lines and the south and southeast, but not abutting the RIB sites. There is bufferyard screening shown on the west perimeter along the SR 429 expressway.

Two types of bufferyards are proposed:

1. North and Northwest - This will be 25 feet in width and will have a row of evergreen shrubs and a canopy tree every 50 feet on average. Some understory trees may be added for additional screening. Existing trees will be retained for the bufferyard.
2. South and Southeast – This will be a more substantial 40 feet in width and be comprised of bamboo trees to the south and evergreen and canopy trees to the southeast, similar to what the County has been implementing at other facilities for screening.

The bufferyards will require irrigation to get established because of the sandy nature of the soilds. Reclaimed water will be used for irrigation. An automatic irrigation system will be needed around the operations building but some permanent or temporary irrigation may be needed in other areas of the site until trees, shrubs and sod is established.

5 BUILDING ARCHITECTURE

The architectural design criteria are summarized in the section. Additional details of are provided in TM No. 6 – Operations Building and Standard Site Architecture (Appendix C). Note: Since the issuance of this TM the Operations Building has been renamed to Administration Building.

Note: Modifications to the location and orientation of the adminsitration and maintenance buildings were made subsequent to the issuance of this memorandum to accommodate changes to the site layout from the Carollo Facility Plan. This is reflected on Drawing A-1.

As part of this project, the following new buildings will be constructed on the site to support the HWRF's operation.

- Pre-treament Structure
- Blower and Main Electrical Building
- Administration Building
- Maintenance Building
- Gravity Belt Thickener Building
- Electrical Buildings
- Chemical Building (Hypochlorite)

5.1 Site Criteria

The architectural style for the HWRF site will follow those of other OCU facilities with low maintenance materials of high durability and life cycle. The HWRF site structures will be designed to be complementary with common elements, materials and colors present on the various structures. Some of the common materials and finishes to be used on the HWRF site will be as follows:

- Foundations: Reinforced concrete spread footings and reinforced concrete slabs on grade unless otherwise recommended by the geotechnical report (Prepared by others).
- Masonry Building Construction: 8 or 12-inch reinforced CMU with split face and integral color and smooth face block with contrasting integral color.
- Metal Building Construction: Steel framing with secondary galvanized steel girts enclosed by galvalume metal siding finished with PVF color coating.
- Roof systems: Concealed fastener, standing seam galvalume metal roof panels on steel trusses and ribbed pre-engineered metal building roof panels on PEMB structural framing. Roof panel finish natural galvalume allowed to weather to a neutral cool gray.
- Hurricane Hardening: All exterior walls, façade elements and roof materials and construction will comply with the FBC, using standards for Miami-Dade and will have a Florida Product Approval notice. Fenestration openings will comply with FBC small and large missile impact requirements.
- Flashings: Stainless steel roof and wall flashings throughout.

- Exterior doors: Impact and corrosion resistant insulated FRP doors and frames with through molded manufacturer's standard gray color and sandstone texture finish.
- Exterior louvers: Aluminum with high resin content fluoropolymer finish; color selected from manufacturer's standard range.
- Overhead doors: Impact resistant heavy duty upward coiling galvanized steel with factory applied paint finish and automatic openers.
- Windows: Exterior glazing are insulated units with Low-E glass and colored anodized aluminum finish.
- Natural Lighting: Insulated windows will be used in occupied spaces. Fenestration design includes providing enough light emitting glazing to provide 75% of the interior day lighting needs.
- Exterior Area Lighting: Building mounted high efficiency lighting with color anodized aluminum finish.
- Miscellaneous metals: As part of the finish coordination, miscellaneous metals not painted as per OCU or industry standards will be color coordinated to match similar prefinished materials.

5.2 Design Criteria

The architectural design criteria for the building systems will be based on system performance, safety, long-term durability, as well as specific requirements requested by the project team, OCU and site requirements.

5.2.1 Building Code

The buildings designed for the HWRF will conform to the following governing code.

- 2017 FBC
- 2017 Florida Building Code Energy Conservation
- 2017 FBC Plumbing
- 2017 FBC Mechanical
- 2017 FBC Fuel Gas
- 2017 Florida Accessibility Code
- 2017 Florida Fire Prevention Code
- 2014 National Electrical Code

5.2.2 Building Code Criteria

The HWRF structures will be analyzed individually by their occupancy classification and construction classification in accordance with the FBC. Buildings and structures with conditioned spaces will comply with the FBCEC except if defined as a low energy use structure. New buildings and structures will comply

with the FLAC except for areas defined in Section 203 General Exceptions of the FBCEC. In cases of exceptions where possible, the design will allow for entry and exit accessibility from the structure.

Drawings G-06 – G-09 summarize the building code criteria for the various structures and buildings.

5.2.3 Accessibility

The provisions of this code will control the design and construction of facilities for accessibility to physically disabled persons. The Administration Building will comply with the provisions of the Florida Accessibility Code. Other structures and spaces frequented only by personnel for maintenance, repair or monitoring of equipment will not be required to be accessible per Section 203.5 Machinery Spaces and Section 203.9 Employee Work Areas.

5.2.4 Administration Building

The Administration Building will be located to the east of the site within line of site to the main entrance gate. The building's main entrance will be protected with a covered drop off and will lead to a small lobby area. There will be a reception area to the right upon entry for visitors. The building will house a SCADA room, four private offices, training room, library, laboratory, mothers room, break room, toilet/shower rooms and associated mechanical and electrical utility spaces. The utility spaces in the Administration Building will also serve the Maintenance Building. The break room will have access to an exterior patio. There will be visitor and employee parking area on the North side of the building. Handicap parking will be located near the entrance. The parking areas will be lighted with high efficiency wall-mounted and pole-mounted fixtures.

The Administration Building will conform to the 2017 FBC and the Florida Accessibility Code. The architectural style for the facility will introduce natural elements and earth tones to blend with the landscape and surrounding elements. All areas will incorporate LEED principles in the interior and exterior design, focusing on material selection, space planning, and fenestration design.

5.2.5 Other Structures

The various process buildings throughout the HWRF site will be constructed of durable materials appropriate to the process equipment they house or storage material. These buildings will be constructed with pre-engineered steel framing and a combination split face CMU and metal wall panels with metal roof panels. Natural light will be utilized where possible with skylights on the roof or windows in walls and the exterior doors will be of FRP construction. Sound treatment in the blower and generator rooms will include acoustical perforated metal panels with sound attenuating insulation on the walls and ceilings. Special design consideration will be given to the chemical buildings which will require containment and fire protection of the stored high hazard materials. Interior materials of the chemical buildings will be compatible with the stored chemicals.

6 STRUCTURAL DESIGN

6.1 Design Codes and References

Design of structural elements will comply with the design codes and standards listed below. The applicable edition of the codes and standards should be confirmed at the start of detailed design.

- 2017 FBC
- ACI 318-14: Building Code Requirements for Reinforced Concrete
- ACI 350-06: Code Requirements for Environmental Engineering Concrete Structures
- ACI 530-13: Building Code Requirements for Masonry Concrete
- ACI 530.1-13: Specification for Masonry Structures
- Geotechnical Engineering Services Report: Geotechnical Investigation Report Southwest Water Reclamation Facility Rib Site 6 at Water Conserv II Orange County, FL, AEA Project No. 201210 performed by Antillian Engineering Associates, Inc.
- AISC 360-16: Specification for Structural Steel Buildings
- ASCE 7-10: Minimum Design Loads for Buildings and Structures
- Aluminum Design Manual, Specifications for Aluminum Structures, 2010

6.2 Design Stresses and Loading Criteria

6.2.1 Design Stress

Table 34. Structural Design Stresses

Structural Element	Design Stress
Structural Concrete, min f'c (specified f'c may be higher for liquid containing structures and for precast concrete)	4,500 psi
Reinforcing steel, fy	60,000 psi
Structural Steel	
Rolled W Shapes, ASTM A992	50,000 psi
Rolled Shapes and Plates, ASTM A36 (min), fy	36,000 psi
Pipe Sections, ASTM A53, Type E, fy	35,000 psi
Tube sections, ASTM A500, Type B or C, fy	46,000 psi
Masonry	

Structural Element	Design Stress
CMU units, Compressive strength	1,900 psi
Compressive strength of mortar, Type S	1,800 psi
Compressive strength of grout	2,000 psi
Masonry unit assembly, f'm (f'm may be higher, if required by design)	1,500 psi

6.2.2 Loading Criteria

Table 35. Structural Design Loads

Parameter	Design Loads
Dead Loads	
Equipment	Actual
Monorails or cranes	Actual with 25% impact load
Roof, superimposed	Actual, 15 psf min.
Live Loads	
Roof (non-reducible)	20 psf
Walkways and Platforms	100 psf
Floor	150 psf (or HS20-44, if applicable)

6.2.2.1 Snow Loads

Not required

6.2.2.2 Seismic Loads

Not required

6.2.2.3 Wind Loads

Wind loads per FBC are summarized in Table 36.

Table 36. Structural Wind Loads

Parameter	Design Criteria
Basic wind speed, 3 second gust	140 mph
Exposure Category	C
Importance Factor	III

Wind loads will be determined in accordance with the governing FBC and in accordance with ASCE 7. The project site will be considered as in the wind-borne debris region, as defined in the FBC. The project site is not located in the, high velocity Hurricane Zone, as defined in the FBC.

6.3 Liquid Containment Structures and Vaults

6.3.1 Materials of Construction

Liquid containing structures will be constructed of reinforced concrete. Any platforms associated with these structures will be constructed of aluminum shapes, aluminum grating, and aluminum guardrail, unless a more corrosion resistant material is deemed appropriate. Connection bolts will be of stainless steel, aluminum, or titanium. Reinforced concrete platforming will be used in locations where the use of grating is not appropriate.

6.3.2 Design Procedures and Assumptions

Liquid containment structures will be designed based upon the loads, load combinations, and allowable stresses contained in the International Building Code, ACI 318, or ACI 350, whichever is applicable.

Listed below is a summary of the primary loading assumptions and load factors for design. Other load combinations will be considered when applicable:

Where:

D = Dead Load

LL = Live Load

F = Lateral hydrostatic pressure

Hw = Flood/Overflow lateral hydrostatic pressure

Hs = Lateral Static Soil Load (including at-rest soil plus groundwater hydrostatic pressure, surcharge, compaction pressures)

Sd = ACI 350, Environmental durability factor (Normal Exposure)

Service Water Condition: Maximum service water level while any adjacent basin is empty, ignore soil backfill loads, consider internal tensile forces in wall, and load combinations as follows:

Flexure: phi*Mn/Sd > 1.4*(D+ F) * M

Shear: phi*Vc + phi*Vs/Sd > = 1.4*(D+F) * V

Tension: phi*Tn/Sd > 1.4*(D+F) * T

Flood/Overflow Water Condition: Maximum water level at flood/overflow elevation (highest water elevation that could occur hydraulically, i.e., not necessarily the top of basin wall) while any adjacent basin is empty, ignore soil backfill loads, consider internal tensile forces in wall but ACI 350 Sd factor ignored, and load combinations as follows:

Flexure: phi * Mn > 1.4 * (D+ Hw) * M

Shear: phi * Vc + phi * Vs > 1.4 * (D+ Hw) * V

Tension : phi * Tn > 1.4 *(D+ Hw) * T

Service Soil Condition: Maximum soil backfill height with at rest pressure, without internal liquid loads, groundwater table at its normal elevation, a minimum soil pressure of 400 psf for compaction decreasing linearly at the same rate as the soil pressure. For an HS20-44 truck load, analyze for a 2 foot additional soil surcharge, not to be combined with the compaction surcharge. Use the worst case of the compaction and HS20-44 surcharge for design. Load combinations as follows:

Flexure: phi * Mn/Sd > (1.2D +1.6H) * M

Shear: phi * Vc + phi * Vs/Sd > (1.2D+1.6H) * V

Flood Soil Condition: Maximum soil backfill height with at rest pressure plus hydrostatic pressure of groundwater at 100 year flood level, without internal liquid loads, a minimum soil pressure of 400 psf for compaction decreasing linearly at the same rate as the soil pressure.

Load combinations as follows:

Flexure: phi * Mn > (1.2D+1.6H) * M

Shear: phi * Vc + phi*Vs > (1.2D+1.6H) * V

If the normal groundwater elevation is near the 100 year flood level, groundwater at the 100 year flood level can be used for the soil service condition and, the load combinations listed in the flood soil condition can be ignored.

Factor of safety of 1.1 with soil shear stress equal to zero shall be considered to resist buoyancy or flotation. Rectangular walls will be analyzed as two-way rectangular plates when the aspect ratio of length to height is 2:1 or less. The boundary conditions will be chosen to provide reasonably conservative results. If the aspect ratio exceeds 2:1, the wall will be designed as a one-way rectangular plate and, the corners will be investigated, assuming a 2:1 ratio.

The design of water containment walls will consider both flexure and tension in walls due to internal water pressure. The tension in the walls may be resisted by both faces of reinforcement in walls.

Direct tension in the foundation and top slabs due to internal water pressure will be accounted for in the design of the slab horizontal reinforcing. The foundation top reinforcement will be assumed to resist 100 percent of the tension at the foundation. The tension in the top slab may be resisted by both faces for reasonably thin slabs.

A minimum reinforcement for shrinkage and temperature will be provided in accordance with ACI 350. A minimum reinforcement ratio of 0.5 percent will be provided in basin walls and base slab, with a basin dimension of 40 feet or more in any direction. Reinforcement ratios in the direction where the structure dimension are less than 40 feet will be in accordance with ACI 350. Minimum size of shrinkage and temperature reinforcement will be #4, and will be divided equally between the two surfaces of the concrete section. Concrete sections greater than 24 inches thick may have minimum reinforcing based on a 24 inch thickness.

6.4 Building Structures

Building structures, excluding structural concrete, will be designed based upon the loads, load combinations, and allowable stresses (or minimum strength requirements) contained in the Florida Building Code. Structural concrete design will be based on strength design in accordance with the Florida Building Code and ACI 318. The additional concrete design requirements of ACI 350 will not be considered applicable for building structures, unless exposed to water, wastewater, or aggressive chemicals. In addition, building structures and their components subject to equipment impact and vibration will be designed in accordance with the applicable recommendations of ACI 350.4R, subject to engineering judgment.

Wind loads will be transferred to the foundation from their origin in a rational manner. The horizontal distribution of wind loads will be based on the assumption that the roof/floor diaphragms are flexible for steel deck diaphragms, and rigid for cast-in-place or precast concrete diaphragms. Where the diaphragm is assumed to perform in a flexible manner, the wind lateral load distribution will be based upon the tributary area to the resisting elements. Where the diaphragm is assumed to perform as a rigid panel, the seismic or wind lateral load distribution is based on the relative rigidities of the resisting elements.

Special inspection for reinforced masonry will be required. The “Unit Strength Method” shall verify the strength of the CMU units, mortar, and grout.

6.5 Inspection

Structural inspection for construction will be required in accordance with the FBC Section 109, and Chapter 17.

7 BUILDING MECHANICAL DESIGN

The following describes the basis of mechanical design and criteria associated with the plumbing and HVAC systems. The selection of the systems will be based on system performance, operating efficiency, safety, long-term durability, redundancy, local representation/service, and ease of operation, as well as site and specific requirements identified by the project team or Orange County.

7.1 HVAC Introduction

The HVAC systems shall perform the following functions:

- Maintain the concentration of combustible and hazardous gases within safe limits.
- Maintain space temperature required for proper operation of equipment and/or comfort of occupants.
- Process incoming outside air, where required, by filtering and conditioning.
- Odor control, where required, shall be designed as described in the above specific design requirement for Odor Control.

HVAC systems were designed in accordance with the Florida Building Energy Conservation Code, 2017. Per Section C101.4.2.4, buildings designed for purposes other than general space comfort conditioning are exempt – this would apply to the structures at HWRF where operations staff are not expected to work in on a regular basis. For the buildings not exempt (administration and maintenance buildings, Pre-treatment structure), a performance compliance method was used ie. the building complies as a whole by means of an energy simulation analysis tool where the performance of the building as designed is compared to its performance when calculated with Standard Reference Design features.

7.1.1 Ventilation Requirements

Process areas shall be ventilated to satisfy the following:

- Ventilation to relieve the heat build-up from process equipment to maintain a 5°F difference between interior and outside temperatures.
- Maintain space temperature required for proper operation of equipment and/or comfort of occupants.
- Recommendations of NFPA 820.
- Ventilation rates to meet odor control criteria.
- Ventilation rates to satisfy Industrial Ventilation Handbook published by American Conference of Governmental Industrial Hygienists.

7.1.2 Air Filtrations

For process control rooms, electrical equipment rooms and laboratory spaces, filters shall have an ASHRAE 52.2 MERV8 (45% ASHRAE 52.1) rating.

7.1.3 Space Pressure Control

Clean spaces shall have a positive pressure relative to odorous and/or corrosive spaces. When adjacent spaces are odorous or contain corrosive environment, the more odorous or corrosive space shall have a negative pressure relative to the less odorous or corrosive space.

Process control rooms and electrical equipment rooms shall have a positive air system with replaceable impregnated carbon filters similar to Puracarb by Purafil, or equal, for removing corrosive gases.

7.1.4 Ductwork

The following duct construction materials shall be provided:

- Supply and exhaust ductwork for process areas, except chlorine and odor control areas, shall be 316-stainless steel.
- Supply and exhaust ductwork for chlorine and odor control areas shall be FRP (PS 15-69, ASTM 3982).
- Velocities in ductwork shall be limited to 1,500 fpm in normally occupied air conditioned areas, 1,800 fpm process areas and 2,500 fpm odor control systems (coordinate odor control ductwork with Odor Control System Design Engineer).
- Round ductwork shall be used wherever possible.
- Where round ducts are inappropriate, rectangular ductwork shall be used and aspect ratios shall be limited to 4 to 1.
- Ductwork shall conform to SMACNA and UL Standards.

Duct work shall be insulated as required by the Energy Code and where necessary to prevent condensation.

7.1.5 Noise

Systems shall be designed to meet the average noise criteria levels recommended by ASHRAE.

7.1.6 Humidity Control

Relative humidity shall be controlled in process control and electrical equipment rooms.

7.1.7 Equipment Accessibility

Equipment shall be located in accessible locations. Provide manufacturers' recommended clearances (no less than 3 feet) between the outermost extremities and adjacent pieces of equipment or between a wall and piece of equipment. Provide access platforms and ladders for elevated equipment that requires service.

7.1.8 Air Conditioning Equipment

Air conditioning equipment shall be split system direct expansion refrigerant type with air cooled condensers located next to the building.

- Process control and electrical equipment rooms shall have precision type air conditioning equipment rated for continuous operation and designed for equipment cooling. Systems shall be designed with 100% redundant backup of the cooling units. Equipment shall be powered from the plant backup electric power circuit.
- Drywell at grade shall be provided for condensate drain.

Exterior equipment mounting shall be designed for wind loading per the Florida Building Code requirements.

7.1.9 Ventilation Air Intake and Exhaust

Ventilation air intake and exhaust shall be through fixed wall louvers and/or roof mounted equipment.

- Air intake and exhaust wall louvers shall be designed for low face velocity 350 fpm maximum. Shut-off dampers for intakes and exhausts shall be located at the intake or discharge opening and not the fan suction or discharge. Architect shall be responsible for louver installation/structural, wind loading, acoustical requirements and flashing design.
- Roof air intakes and exhausts mounting shall be designed and equipment rated to meet the wind loading requirements of the Florida Building Code.

7.1.10 Control Systems

The control system for HVAC equipment shall interface with the plant control system for alarms and data gathering. The HVAC control system shall include local control panels for equipment, provided by the equipment manufacturer.

7.1.11 Corrosion Control

Corrosion control shall be provided to improve the performance, reduce maintenance, and extend the operating life of the HVAC equipment.

- Equipment located in process areas shall be 316-stainless steel, FRP or epoxy coated steel or aluminum.
- Heat transfer coils and fan wheels shall be coated with a baked on epoxy coating system.
- Air intake and exhaust louvers shall be coated with polyvinylidene fluoride, the homopolymer of 1,1-di-fluoro-ethene (VF2), similar to Kynar® or equal.

7.1.12 Calculations

Calculations shall follow the methodology outlined in the applicable energy codes and ASHRAE Handbooks. At minimum, calculations shall be performed for the following:

- Heat transmission coefficients
- Space heat gain
- Space ventilation rates
- Exhaust ventilation capture velocity
- Ductwork pressure loss
- Fan motor sizing
- Condensation control
- Solar space loads
- Ventilation rates shall be calculated for all applicable criteria, and the highest ventilation rate shall be used for the design.

7.1.13 Applicable Codes and Standards

Design will be based on, but not limited to, the following codes and standards.

- Florida Building Code (2017)
- Florida Mechanical Code (2017)
- Florida Plumbing Code (2017)
- Florida Fire Protection Code (2017)
- Florida Energy Code (2017)
- National Electrical Code (NFPA 70, 2014)
- Occupational Safety & Health Administration Regulations
- American Society of Heating, Refrigerating and Air Conditioning Engineers
- Sheet Metal and Air Conditioning Contractors National Association
- Air Moving and Conditioning Association
- Standard for Fire Protection in Wastewater Treatment and Collection Facilities (NFPA 820, 2012)
- Associated Air Balance Council
- American Conference of Governmental Industrial Hygienists

7.2 Plumbing Introduction

The following describes the basis of mechanical design and criteria associated with plumbing systems. The selection of the systems will be based on:

- System Performance

- Operating Efficiency
- Safety
- Long-Term Durability
- Ease of Operation

7.2.1 Storm Drainage System

Primary and secondary roof drainage systems will be provided for all flat roofed areas of new buildings. The primary systems will consist of roof drains and interior piping which will discharge above grade to splash blocks where feasible, and to the below grade storm drainage system when necessary to prevent a nuisance. The secondary system will consist of overflow roof drains set at an elevation two inches above the primary roof drains. There will be one overflow roof drain for each primary roof drain. The overflow roof drains will be piped on the interior of the building independently from the primary system, and will discharge above grade. All horizontal storm drainage piping within structures will be sized based on a slope of 1/8 inch per foot. Sloped roof areas will be drained by gutters and downspouts which will discharge to grade.

7.2.2 Sanitary Drainage System

All plumbing fixtures and floor drains located on the floor at or above grade will discharge by gravity to the sanitary sewer main. All floor drains, funnel receptors, and plumbing fixtures connected to the sanitary drainage system will be provided with traps and vents. Where individual vents cannot be provided for each trap due to physical constraints, a combination waste and vent system will be used.

7.2.3 Potable Water Piping Systems

Potable water from the public water main will be supplied to the domestic water fixtures and emergency shower/eyewash fixtures. Protection of the potable water system will be in accordance with local codes or standards. Reduced pressure principle backflow preventers will be provided on the water supply to each new building and non-potable water systems. Vacuum breakers will be provided on hose faucets and wall hydrants served by the potable water system when a non-potable water system is not available.

Domestic hot and cold water will be provided to plumbing fixtures as required. Tempered water will be provided to emergency shower/eyewash stations in accordance with ANSI Standard Z358.1 and the Florida Plumbing Code.

Hot water will be provided by electric storage type and/or instantaneous water heating equipment.

7.2.4 Piping Materials

Piping material for potable and tempered water systems will be ASTM B88, Type K or L copper.

Aboveground storm, soil and waste drain piping will be standard weight no-hub cast iron, ASTM A 888 or CISPI 301 pipe with DWV pattern standard weight cast iron fittings and heavy duty Anaco “Husky” series 4000 Type 304 stainless steel couplings with a minimum of 4 straps.

Underground storm, soil, and waste drainage pipe inside building and to a point 5'-0" (five feet) outside of the building will be standard weight cast iron soil pipe and fittings conforming to ASTM A74. Joints will be hub and spigot, caulk joint, or installed with compression gaskets conforming to ASTM C-564.

Vent pipe and fittings shall be of the above mentioned hub and spigot type or of the PVC DWV type with solvent-cement joints conforming to DWV Schedule 40 PVC, ASTM D2665.

7.2.5 Plumbing Fixtures

Plumbing fixtures will be selected for durability and ease of maintenance and housekeeping. Water closets will be wall mounted flushometer valve type. Showers will be of the pressure balanced type for scald protection. All fixtures will be of the low water consumption type. Plumbing fixtures accessible to the disabled will be provided in accordance with Federal and State requirements.

7.2.6 Applicable Codes and Standards

Design will be based but not limited on the following codes and standards.

- American Society of Plumbing Engineers Handbooks
- Florida Building Code (2017)
- Florida Mechanical Code (2017)
- Florida Plumbing Code (2017)
- Florida Fire Protection Code (2017)
- Florida Energy Code (2017)
- National Electrical Code (NFPA 70, 2014)
- Occupational Safety & Health Administration Regulations
- American Society of Heating, Refrigerating and Air Conditioning Engineers

8 ELECTRICAL

8.1 General

The following provides an overview of the incoming service, the proposed electrical distribution system and the emergency power standby system for the HWRF.

8.2 Incoming Power Options

8.2.1 Duke Energy Substations

The area in which the HWRF is to be located is served by Duke Energy of Florida. Several substations are located within three miles from the proposed site.

8.2.1.1 Isleworth Substation

The Isleworth Substation is located approximately three miles southeast of the site in a residential area south of Lake Butler. Feeders extend the area north and east of Lake Louise, areas south and east of Lake Burden and to the area adjacent to Lake Speer. Due to the current Duke Energy distribution; this substation is deemed to be a non-viable option.

8.2.1.2 Avalon Substation

The Avalon Substation, located approximately one mile west of the proposed site. The substation is currently a Duke Energy Transmission Substation not distribution. Duke Energy indicated that they are in the planning stages of upgrading the substation to serve as both transmission and distribution. It is anticipated that the substation upgrades will be completed within the next five years at an approximate cost of $3,500,000 to $5,000,000. This upgrade is based on proposed growth in the surrounding areas including but not limited to the proposed Malcolm Road Water Treatment Plant and the Conserv II Booster Pump Station.

8.2.1.3 Reedy Lake Substation

The Reedy Lake Substation is located approximately three miles to the south. The Conserv II Distribution Center and the adjoining RIBs are served from the Reedy Lake Substation. Separate 15 kV feeders extend from the substation along Avalon Road; one that continues west along Mickinney Road to a set of risers across from the distribution center, and a second to a pad mounted primary switch which serves the RIBs via a customer owned 15 kV loop.

8.2.1.4 Lutz Substation

The Lutz Substation is located adjacent to the 429 Toll Road, south of the Winter Garden Village. The substation is a distribution type substation that serves the Winter Garden Village and the area north of the proposed WRF site.

8.3 Incoming Service

Based on discussions with Duke Energy, two options are available to serve HWRF. The options both originate at the Avalon and Reedy Lake Substations. The feeder from Reedy Lake Substation (feeder 1104) is currently loaded at 50% of its capacity. This option would allow Duke Energy to extend primary from existing overhead lines along Malcolm Road. This option would also allow Duke Energy to transfer load from Reedy Lake Substation to the Lutz Substation should the need arise. This transfer would be transparent to Orange County as it would be accomplished through existing switches in Duke Energy's infrastructure.

The second option would be for Duke Energy to extend a primary distribution line from the Avalon Substation once the upgrades are completed by Duke Energy. A dedicated feeder could be acquired from the Avalon Substation. Additional coordination and discussions will be required with Duke Energy.

8.3.1 Option No. 1 – Reedy Lake Substation

This option would extend primary service from the intersection of Avalon Road and Malcolm Road approximately 5400 LF to the east along Malcolm Road. The extension can be run either overhead or underground. This option would have the primary extend to a Duke Energy owned and maintained primary switch that would be located adjacent to the entrance to the HWRF. Customer owned 15 kV feeder would then extend to the main electrical building. The estimated Duke Energy costs would be as follows:

- Overhead service with a Primary Switch: $30,000 to $100,000
- Underground service with Primary Switch: $200,000 to $300,000

8.3.2 Option No. 2 – Avalon Substation

This option would extend primary service from the new distribution switch at the Avalon substation. In this option, the primary would be extended approximately 45000 LF to the northeast to a Duke Energy owned and maintained primary switch that would be located adjacent to the entrance to the HWRF. Customer owned 15 kV feeder would then extend to customer owned oil-filled pad mounted transformers located adjacent to the electrical building. The estimated costs would be as follows:

- Overhead service with a Primary Switch: $0 to $30,000
- Underground Customer Owned 13 kV line:$200,000 to $250,000.

Option No.2 is the recommendation option, assuming the upgrades are completed by Duke Energy. This would allow the plant to have a dedicated feeder without impacting the capacity of the Reedy Lake Substation.

8.4 Electrical Distribution

8.4.1 Electrical Distribution Criteria

In order to meet requirements for Class 1 Reliability as required by the EPA's Design Criteria for Mechanical, Electric, and Fluid System and Component Reliability (EPA-430-99-74-001), the line-up will consist of a main-tie-tie-main configuration with standby generators on the common bus. The class requirements are listed below:

"The electrical distribution design criteria should include considerations for reliability, maintainability and safety. To provide for a reliable distribution, the system should be designed with two independent sources of power and protection from common mode failure. These sources are generally two totally independent utility sources or a utility service and sufficient standby power, to allow complete operation of the plant in order to meet discharge permit requirements."

The anticipated cumulative loads per phase are as shown in Table 37:

Table 37. Anticipated Loads

Description	Phase 1	Phase 2	Phase 3
Headworks, HP	94	111.5	123
BNR Trains, HP	1820	2740	3660
Clarifiers, HP	19.5	26	39
Filters, HP	25	35	45
Reclaimed Water Distribution Pumps, HP	1500	2500	3500
Effluent Transfer Pump Station, HP	450	750	1050
Solids Recycle Pump Station, HP	50	50	50
RAS Pump Station, HP	200	240	360
WAS Pump Station, HP	30	30	45
Chemical Systems, HP	8	13	18
Solids Handling, HP	696	1134	1571
Ancillary Equipment, HP	44	45	58
Total			
HP	4937	7675	10519
Ampacity			
480 volts	6131	9532	13064
4160 volts	707	1366	1872
12470 volts	236	367	503

The intent is to locate the conditioned electrical rooms in central locations adjacent to the loads which it serves; three additional electrical rooms are anticipated. The initial installation will be based on a combined load of approximately 5,000 HP connected. Utilizing a demand factor of 70%, the electrical system is based on load of approximately 3,500 HP. The main switchgear will allow for plant expansion or an ultimate loading of 10,500 HP.

8.4.2 Proposed Electrical Distribution

In order to meet requirements for Class 1 Reliability as required by the EPA's Design Criteria for Mechanical, Electric, and Fluid System and Component Reliability (EPA-430-99-74-001), two options have been evaluated.

8.4.2.1 Option No. 1

Providing two feeders to the plant from two independent Duke Energy Substation(s):

- The existing Reedy Lake Substation Feeder No. 1104 overhead service to the facility would be extended to the proposed facility along Malcolm Road.
- A second substation, Avalon Substation, is located approximately 1 mile from the facility. For the purpose of these preliminary discussions, a direct overhead route to the plant is assumed.

Under this option, we would maintain independent power provided by standby generators. In order to provide adequate standby power capacity associated with the Phase 3 process upgrades, approximately 7,300 kW of emergency power capacity is required. The generators will provide power to the new facilities during those occasions when the preferred sources are unavailable.

8.4.2.2 Option No. 2

Providing one (1) utility service and sufficient standby power:

- A feeder from either of the substation listed above would serve as the preferred source of power. The basis of design includes the installation of two Duke Energy pad mounted metering cabinets.
- The second source of independent power is to be provided by standby generators. In order to provide adequate standby power capacity associated with the Phase 3 process upgrades, approximately 7,300 kW of emergency power capacity is required. The generators will provide power to the new facilities during those occasions when the preferred source is unavailable.

8.4.3 Proposed Power Distribution

Primary selective, secondary selective and radial primary, and secondary selective feed distribution systems were considered as possibilities for providing 13,000 volts power to facility step down transformers. The following provides a brief overview of each system.

A primary selective system is a loop configuration that allows the primary of the site distribution step down transformers to be served from either of two separate 13 kV feeders. Primary feeder selector switches are required to be furnished. This type of distribution system provides increased reliability over a radial primary feed system. However, this increased reliability comes at the expense of operational complexity

and higher material costs associated with the 2X number of underground feeders required to be installed to each site transformer and the required primary selector switches

A 13 kV radial distribution system provides a direct feed from the 13 kV switchgear breakers to the primary of the individual transformer it serves. This type of system simplifies trouble shooting, provides a simpler electrical system to coordinate, reduces maintenance problems and lowers electrical equipment costs due to the elimination of redundant primary feeders to each transformer. However, in the event of a primary feeder failure or transformer failure, reliability must be maintained to critical operating loads thru secondary selectivity on the secondary side of the primary step down transformers.

It is our opinion that the added reliability of the primary selective system does not justify the significant cost increase and additional operating complexity over the primary radial, secondary selective distribution system. As such, the proposed design in this report is based on the radial primary service, secondary selective distribution system design.

It is proposed that the loads associated with the proposed facility, Phase 1, Phase 2 and Phase 3, be served from a common power distribution system. The combined loads of the three phases will total approximately 10,500 horsepower, which at a 70% demand factor will equate to 7,350 kW.

The proposed switchgear will be double-ended (dual main breakers), operating at a Duke Energy supply voltage of 12,470 volts. The switchgear will be fed from two separate Duke Energy primary switches. In the event that power is lost from one of Duke Energy switches, the switchgear will automatically open the affected main breaker corresponding to that incoming line and close the station tie breaker. This will allow the entire plant to be fed from one main breaker, with the second main breaker remaining only as a backup.

The 12,470-volt Switchgear will be located in the proposed electrical building in an environmentally conditioned space. This switchgear is proposed to be automatically operated. As such, should a feeder or main breaker fail plant staff would not be required to manually make the transition to the available feeder or available main breaker. With this design Class 1 reliability throughout the plant will be enhanced and potential downtime of process equipment will be minimized in the event of primary cable or equipment failures.

All loads associated with the proposed process upgrades will be served from this distribution system thru step down transformers and 480 volt distribution equipment located throughout the site.

8.4.4 Standby Power System Improvements

In order to provide adequate emergency power capacity and proper generator protection for the future loading associated with the process upgrades at the HWRF, firm standby power capacity will be required. Approximately 7,300 kW of emergency power capacity is required to run the ultimate plant process loads. The generators will provide power to the new facilities during those occasions when Duke Energy service is unavailable.

The proposed 15,000-volt switchgear is configured such that the generators will serve the line-up from a common generator bus with a tie breaker on either side allowing the generator to support the south bus should Main 1 be lost or the north bus should Main 2 be lost of both. Should Duke Energy power be lost both mains will be opened, both tie breakers will close and the entire facility will be supported by the

standby generators. The diesel generators would be connected to the switchgear through an automated scheme. Under the Phase 1, two 2,500 Tier 4 generators will be installed . At buildout four will be installed.

Generators are subjected to various types of faults in both the alternating current stator and the direct current rotor. Some of these are phase-to-phase or phase-to-ground short circuits, over current, overheating, motoring, and loss of excitation. The basic protection requirements for the proposed generators will consider the following:

- Internal Faults - High speed protection is desirable to limit the effect of prolonged short circuits on power system stability as well as limit the degree of damage. Differential protection will be utilized to quickly take a generator off line on the event of an internal fault. Speed is critical to limiting damage to generators under these conditions. The Siemens 7UM62 relay will be utilized to accomplish this required protection.
- External Faults - As is the case for internal faults, high-speed protection is desirable to limit the effect of prolonged short circuits on power system stability as well as limit the degree of damage to emergency generator components.
- Loss of Excitation - Loss of excitation in a generator may bring about severe voltage disturbance on the rest of the power system, thereby causing instability and impairing system operation. It may also cause overheating of the rotor due to currents induced in the rotor when the generator loses synchronism with other machines.
- Field Ground (Mechanical & Heating Damage) - It is usual practice to operate the generator field circuits ungrounded so that a simple ground will not result in damage to the generator. However, since a second ground may cause damage, the use of a generator-field ground relay is desirable.
- Loss of Prime Mover - Loss of the prime mover will cause the generator to run as a motor. Protection is desired to benefit the prime mover and the Facility electrical system.
- Rotor Overheating - Unbalanced system loads, system impedance and unbalanced faults produce negative phase sequence components of current which can cause excessive heating in critical parts of the generator rotor. Therefore, standards were established defining generator continuous and short-time unbalanced current capabilities in terms of negative sequence current and rotor heating criteria.
- Stator Overheating - Protection will be provided to prevent excess stator overheating which is usually due to overloading or failure of the cooling system.
- Loss of Potential - Satisfactory operation of the voltage regulator and certain relays requires proper output from their associated potential transformers. Failure of these potential circuits will, in the case of the regulator, cause the generator excitation voltage to go to its ceiling level. Loss of restraint voltage on relays may result in unnecessary tripping and shutdown of the generator, etc. Thus, a means of monitoring these potential circuits is desirable.
- Under Frequency - Under frequency protection will prevent generator damage from out-of-phase re-energization due to automatic reclosing. Also, it will prevent overheating or possible stalling of the generator when an excessive load is imposed.

- Bearing Overtemperature - Detection of abnormal machine bearing temperatures will be provided for the main bearings of engines.

8.4.4.1 Standby Generator Fuel System

Above ground fuel storage tanks will be provided for fuel storage for the associated engine-generator. The fuel storage system will be designed based on 75% load fuel consumption for five days for two generators. Each fuel storage tank will be constructed with an inner primary steel tank wrapped with a HDPE liner all encased in concrete. Each fuel storage tank will be installed outside on a concrete slab next to the engine-generator building and shall be in accordance with NFPA 30, UL 142, UL 2085 and FAC 62-761 Codes and Standards. Each tank will have leak detection and will utilize a common remote fill box to permit refilling of each tank from ground level. Each engine generator will also be provided with a package day tank, located in the engine generator building and next to each associated engine generator. Each day tank package will include a supply pump, an overflow/return pump to prevent overfilling of the day tank, and a rupture basin. All piping between the fuel storage tank and each day tank will be located above the ground. See Table 38 for a summary of the fuel storage system.

Table 38. Back-up Generator Fuel Storage System

Parameter	Design Criteria
Generator Size	2,500 kW
Number of Generators	2
Fuel Consumption at 75% Load	131 gph
Number of days of storage	5
Total storage volume required (90% fill)	35,000 gallons
Proposed storage	2 x 20,000-gallon tanks
Tank type	Above ground steel cylindrical

8.4.5 15,000 Volt Power Distribution

8.4.5.1 15,000 Volt Switchgear

The Metal-Enclosed Medium Voltage Drawout Breaker Switchgear described herein shall be designed for operation on a 15,00 V, 3-phase, 3-wire, 60 Hertz system. The switchgear main bus shall be rated 1200 amperes and shall be constructed so that all buses, bus supports, and connections shall withstand stresses that would be produced by fault currents equal to the close and latch rating of the circuit breakers.

The proposed volt switchgear shall be configured such that the generators will serve the line-up from a common generator bus with a tie breaker on either side allowing the generator to support the south bus should Main 1 be lost or the north bus should Main 2 be lost of both. Should Duke Energy power be lost

both mains will be opened, both tie breakers will close and the entire facility will be supported by the standby generators.

The switchgear assembly shall consist of completely metal-enclosed, dead front vertical sections. The switchgear shall be a metal-enclosed design incorporating the requirements from IEEE standard C37.20.3 and C37.20.2.

The following features shall be supplied on every compartment containing a drawout vacuum circuit breaker. Circuit breakers shall utilize vacuum interrupters for interruption and switching functions. The current transfer between the circuit breaker and primary circuits conductors in the compartment shall be via heavily silver plated and spring loaded copper finger cluster (primary disconnect) on the breaker, and rigidly mounted silver plated copper stabs within the insulated housing mounted on the compartment wall.

The breaker front panel shall be removable when the compartment door is open for ease of inspection and maintenance of the mechanism. Each circuit breaker shall include contacts Open/Close and spring Charged/Discharged status indications on the front of the breaker.

Each circuit breaker shall be electrically operated. Energy required for closing and opening of the circuit breaker shall be provided by charging of springs by an electrical motor. Electrical closing/opening of the circuit breaker shall be accomplished by energizing spring release coil/shunt trip coil.

The System shall permit the operation of the Generators in either “CTM” or “OTM”. The operating mode shall be selectable from the HMI by the OWNER. In the CTM, automatic operation shall allow for parallel operation with the PEF power grid in either generator start or shut down modes. In the OTM mode, the System shall completely isolate the operation of the Generators from the PEF power grid at all times.

The trip unit shall be microprocessor based that operates from secondary output of current sensors and external voltage transformers and provide true RMS sensing of each phase and ground, and suitable for application to 60 Hz systems. The overcurrent protection functions of the trip unit shall be self-powered from the current flowing in the secondary of the current sensors. The trip unit shall provide the following ANSI/IEEE protection functions:

- 51/50 (time and instantaneous overcurrent) for each of the (3) phases
- 51/50N or 51/50G (time and instantaneous overcurrent) for ground
- 37 (phase loss, with adjustable time delay)
- 46 (current unbalance, with adjustable time delay)
- 27 (3-phase undervoltage, with adjustable time delay)
- 59 (3-phase overvoltage, with adjustable time delay)
- 81U (underfrequency, with adjustable time delay)
- 81O (overfrequency, with adjustable time delay)
- 47 (voltage unbalance, with adjustable time delay)
- 32 (reverse power, with adjustable time delay)

8.4.5.2 Medium Voltage Cable

Copper conductors shall be used throughout. Conductors shall be MV-90 single conductor medium voltage cable, Class B, Copper Strand with 133%, EPR conforming to NEMA WC 8 (ICEA S-68-516). The Voltage Rating shall be 5kV, with temperature ratings of 90oC for normal operation, 130oC for emergency overload operation, and 250oC for momentary short circuit operation. Shielding shall be 5 mil thick copper tape, helically applied with a minimum 125% overlap, over semiconducting insulation shield. Jacket shall be Sunlight-resistant PVC, 80 mils thick.

8.4.5.3 Pad Mounted 15kV to 480/277 Transformers

Transformers shall be oil filled and of outdoor padmount, compartmental-type design. Units shall be an integral assembly consisting of transformer, tank and medium voltage and low voltage cable termination compartments. Transformers shall be of tamperproof and weatherproof construction. Tank shall be all--welded construction with bolted-on-handle beneath a removable weather cover. Tank shall have lifting hooks and provisions for jacking, rolling, and sliding. There shall be no exposed screws, bolts, or other fastening devices which are externally removable.

Incoming and outgoing terminal compartments shall be full height, 24 inches deep, air filled, located side-by-side, and with medium voltage on the left. Medium voltage termination compartment shall be separated from the low voltage termination compartment by a steel barrier.

Medium voltage section for all transformers shall be loop feed dead front with load break current limiting fuses for transformer primary protection. Fuses shall have an interrupting, rating of 65,000 amperes RMS symmetrical minimum. The medium voltage section shall be equipped with bushing wells with bushing inserts and load break elbows with test point and phase indictor.

The pad mounted transformers will have the following characteristics:

- Transformer designation: With pressure sensitive reflective marker mounted on outside of compartment.
- Type: Oil immersed, self-cooled, pad mounted for incoming and outgoing step down service
- Temperature Rise: 65 °C
- Ambient Air Temperature: Average - 30 °C / Maximum - 40 °C
- Medium Voltage Winding: 12,470 V Delta
- Low Voltage Winding: 480V Wye
- Frequency: 60 Hz
- Phase: 3
- Impedance: Low impedance 1.5 percent minimum
- Medium Voltage Taps: Four 2 ½ percent full Capacity

8.4.6 480 Volt Power Distribution

8.4.6.1 Distribution System Description

The 480-Volt distribution system shall consist of dead front type, low voltage metal-enclosed switchgear. Switchgear described herein shall be designed for operation on a 480V, 3-phase, 3-wire, 60 Hertz system. The switchgear main bus shall be rated based on the loads served and shall be constructed so that all buses, bus supports and connections shall withstand stresses that would be produced by fault currents equal to the close and latch rating of the circuit breakers.

The assembly shall be rated to withstand mechanical forces exerted during short-circuit conditions when connected directly to a power source having available fault current of 200,000 amperes symmetrical at rated voltage. The bus system shall have a minimum ANSI short-circuit withstand rating of 200,000 amperes symmetrical.

All circuit breakers shall have a minimum symmetrical interrupting capacity of 200,000 amperes. Circuit breakers shall be equipped with current limiters and the combination shall have short-time ratings in accordance with the characteristics of the limiter selected. All ratings shall be tested to the requirements of ANSI C37.20.1, C37.50 and C37.51 and UL witnessed and approved.

All protective devices shall be drawout low-voltage power circuit breakers. All breakers shall be UL listed for application in their intended enclosures for 100% of their continuous ampere rating.

All power circuit breakers shall include current limiters. Limiters shall be integrally mounted on breakers. For larger breakers, limiters shall be mounted on a separate drawout limiter truck. Current limiters shall be coordinated with the breaker trip device, so as to avoid unnecessary blowing of the current limiters. Current limiters which are integrally mounted with breaker shall be inaccessible until the breaker is completely withdrawn from its compartment assuring complete isolation. Current limiters mounted on a separate truck shall be key-interlocked with the breaker to prevent withdrawing or insertions unless the breaker is locked open

Breakers shall be EO is indicated on the drawings. Electrically operated breakers shall be complete with operators, OPEN/CLOSE pushbuttons, plus red and green indicating lights to indicate breaker contact position.

8.4.6.2 Motor Control Centers

The Motor Control Center(s) shall be 600-volt class suitable for operation on a three-phase, 60 Hz system. Structures shall be totally enclosed, dead-front, free-standing assemblies. Structures shall contain a horizontal wireway at the top, isolated from the horizontal bus via metal barriers and shall be readily accessible through a hinged cover. Structures shall also contain a horizontal wireway at the bottom.

Compartments for mounting control units shall be incrementally arranged such that not more than six (6) Size 1 starters can be mounted within each vertical structure. A vertical wireway with minimum of 35 square inches of cross-sectional area shall be adjacent to each vertical unit and shall be covered by a hinged door.

Plug-in compartments shall totally isolate enclosed equipment. All unused openings to the adjacent vertical wiring space shall be plugged. All openings used for wiring shall have insulating grommets. Each section shall be provided with a horizontal wiring space which shall line up with a similar space in the adjacent section or sections, with openings between so that wires may be pulled the entire length of the control centers. There shall also be provided in each section a vertical wiring space with separate full height door.

The motor control centers shall be designed for against-the-wall mounting. All wiring, bus joints and other mechanical parts requiring tightening or other maintenance shall be accessible from the front or top. Construction shall be NEMA Class II, Type B or C.

Each structure shall contain a main horizontal tin-plated copper bus; the horizontal bus shall be rated at 50 degrees C temperature rise over a 40 degrees C ambient in compliance with UL standards. Vertical bus feeding unit compartments shall be tin-plated copper and shall be securely bolted to the horizontal main bus. All joints shall be front-accessible for ease of maintenance. Both vertical and horizontal bus shall be fully rated; but shall not be tapered.

8.4.6.3 Distribution System Protection

The following types of protective devices shall be used for the low voltage distribution systems.

- 480-volt Switchboards – 100% rated insulated case circuit breaker with solid-state trip for mains and feeders 400A and larger. Smaller feeders will be accommodated via local 480-volt panelboards.
- 480-volt Motor Control Centers – Main breakers shall be 100% rated molded case with solid state trip.
- 480-volt feeder circuit breakers in Motor Control Centers and Panelboards, 400A and larger – Shall be 100% rated, molded case with solid state trip.
- 480-volt feeder circuit breakers in Motor Control Centers and Panelboards, smaller than 400A (other than for combination motor starters) – Shall be molded case, thermal magnetic type.

All electrical equipment shall have adequate momentary and interrupting capacity to withstand fault currents that may occur at the point in the system where the equipment shall be applied. Ground fault protection on main breakers and feeder breakers shall be equipped with time delay setting and restraint systems, unless indicated otherwise on the design drawings.

8.4.6.4 Surge Suppression

High Performance SPD shall provide effective high energy transient voltage surge suppression, surge current diversion and high frequency noise attenuation in all electrical modes for equipment connected downstream from the facility's meter or load side of the main over current device. The unit shall be connected in parallel with the facility's wiring system.

All SPD Devices shall be mounted externally to all equipment that it serves. The unit shall include an integral safety interlocked disconnect located in the unit enclosure with an externally mounted manual operator.

Systems shall be designed, manufactured, tested and installed in accordance with the following applicable documents and standards:

- Underwriters Laboratories (UL1449 2nd Addition and UL 1283)
- National Electrical Manufacturers Association (NEMA LS1 – 1992)
- ANSI/IEEE (C62.41 – 1991 and C62.45 – 1992)
- Military Standards (MIL – STD 220A)
- National Electric Code
- Underwriter's Laboratories 248

8.4.6.5 Motors

Motors from ½ to 500 hp shall be powered at 480-volts, three-phase. Motors of less than ½ hp shall be powered at 120-volts, single-phase. The code allowable total voltage drop from the 480-volt source bus to the point of use shall not be exceeded.

For motors with motor starters, the overload protection will be in the motor starter. For fractional horsepower equipment not normally requiring motor starters, manual motor starters with overload protection will be added. Some small equipment such as fractional horsepower fans will have overload protection integral with the motors.

All constant-speed motors 60-hp and larger shall be equipped with electronic reduced voltage starters (soft starters). Each motor shall be provided with thermal overload protection in all ungrounded phases. Controller-mounted relays shall have an external manual reset.

Internal temperature detectors embedded in motor windings shall be specified for motors of 100 hp and larger and all motors 10 hp and larger that are powered by a Variable Frequency Drive. Temperature detectors in motors smaller than 100 hp shall be thermostat type. Motors of 100 hp and larger shall have thermistors. Multi-function protective relays for overload, phase protection, and ground fault protection shall also be provided on motors of 100 hp and larger.

VFDs less than 250HP will be specified with bypass contactors. All motor control circuits shall operate at 120 volts AC and shall be supplied by individual control power transformers fused both in the primary and secondary sides.

Disconnects shall be provided at all motor loads that are not within line of sight of their control equipment. Some HVAC equipment and motor-operated-valves may be specified with integral disconnects, if that is a standard option.

8.4.6.6 Variable Frequency Drives

VFDs can help save motor energy by allowing for variable flow based on the demands and needs of the facility. This is accomplished by converting the fixed frequency of incoming AC voltage to DC — and then reconverting it back to AC voltage by varying the frequency at which the IGBTs are gated on and off.

8.4.6.6.1 Basic Operation

A VFD operates by converting the input sinusoidal AC voltage to DC voltage and then back to AC voltage. This conversion occurs by using either SCRs or IGBTs. The DC voltage is switched using IGBTs to create an AC output voltage (called the inverter). The IGBT can switch on and off to create an AC voltage waveform that delivers power to the motor. The IGBTs create an AC waveform by using PWM switching. The frequency at which the switching occurs, is called “carrier frequency.”

A typical 6-pulse VFD has six diodes as a front-end bridge rectifier that converts AC to DC. VFDs can also have 12 diodes — two sets per phase (2 × 2 × 3 = 12 pulse) — or 18 diodes — three sets per phase (3 × 2 × 3 = 18 pulse). One set of diodes is supplied by a Delta-Y transformer to create a phase shift on the AC side between the two rectifiers to reduce harmonics reflected back to the source.

8.4.6.6.2 6-Pulse VFD

A 6-pulse VFD develops the output DC voltage by taking each phase of the AC source and installing one set of diodes to gate on and off. A 6-pulse VFD is most commonly used in the building system. Typical current total harmonic distortion back to the source can be as high as 35% at the input terminals of the VFD. You can install an inline inductor to reduce the reflected harmonics back to the point of coupling, as defined by IEEE 519. The inductor reduces the current distortion — and thus the voltage distortion — at the source. The input line inductors are typically 3% to 5% impedance. Base the selection of the inductor on harmonic evaluation of the electrical system at the building, impact of voltage drops across the inductor, and impact of power factor to the building electrical system.

8.4.6.6.3 19-Pulse VFD

As the loading at this station is primarily non-linear, VFDs 18-pulse VFDs are to be used in order to reduce the harmonics reflected back to the source. The design will be in accordance with IEEE 519.

An 18-pulse VFD provides low harmonic distortion through phased cancellation of primary harmonics (5th and 7th) and the higher order harmonics that could cause resonance on capacitive and inductive loads (such as filters, transformer, etc.). The anticipated THD at the input terminals can be less than 5%; therefore, lower total voltage harmonic distortion will be realized at the source.

VFDs shall meet all requirements as outlined in the 2014 edition of IEEE 519 for each individual and total harmonic voltage and current distortion. As per Table 10.2 of IEEE 519, individual or simultaneous operation of the VFDs shall not add more than 3% total harmonic voltage distortion while operating at full load and speed from the utility source, or more than 5% while operating from standby generator (if applicable).

As per Table 10.3 of IEEE 519, maximum allowable total harmonic current demand distortion limits for each VFD operating at full load and speed shall not exceed 5% as calculated and measured at the point of common coupling (ISC/IL < 20). The point of common coupling for all harmonic calculations and field measurements for both voltage and current distortion shall be defined as the VFD input terminals.

8.4.6.7 Panelboards

Lighting panels shall be surface-mounted, 208Y/120-volt, three-phase, four-wire type, with the main circuit breaker sized to match the lighting transformer capacity. Transformers to supply 208Y/120-volt requirements shall be dry type and suitable for the area in which they are to be located. Separate panelboards shall be provided to supply power to instruments and control panels where the equipment to be supplied requires a conditioned power supply. Each panelboard will be provided with a minimum of 20% spare breakers with spaces, bus work, and terminations to complete the standard size panel. Panelboard schedules shall show the circuit description, protective device trip rating, number of poles, and rating of main lugs or main circuit breaker. Where multiple instruments are connected to a single-branch circuit, a toggle switch shall be provided at each tap to allow each individual instrument to be disconnected from the branch circuit.

8.4.6.8 Convenience Receptacles

Convenience receptacles for general service shall be spaced not more than 40 feet apart inside all process buildings and 75 feet apart in outside process areas. They shall be located on the surface of walls or columns. Receptacles shall be located as needed in commercial areas. Receptacles shall be provided at air conditioning units and air handling units as required by the NEC. Where wash-down is expected, outlets shall be located 48 inches above the floor.

8.4.6.9 Raceways

Specific types of raceway shall be chosen for use in various locations in the facility, based on moisture, temperature, exposure to damage, corrosion, voltage and cost.

- Exterior, exposed conduit shall be aluminum.
- Exterior, corrosive areas, PVC-coated rigid steel shall be used.
- Exterior, underground, direct-buried conduit shall be schedule 80 PVC.
- Exterior, underground, concrete-encased conduit shall be schedule 40 PVC.
- Interior, exposed conduit in dry areas shall be aluminum.
- EMT shall be allowed from 5’ above finished floor and higher with exposed conduits feeding lighting circuits in non-corrosive dry areas.
- Interior, exposed conduit in corrosive areas shall be PVC schedule 80.
- Interior, concealed conduit shall be schedule 40 PVC.
- PVC conduit runs shall use PVC coated galvanized steel elbows.
- The minimum diameter of conduit shall be ¾ inch.

8.4.6.10 Wire and Cable

Copper conductors shall be used throughout. Solid conductors shall be permitted for lighting and receptacle circuits. All other applications shall employ stranded conductors. The current-carrying capacity of conductors shall be based on 75o C insulation ratings. Conductors No. 6 AWG and smaller shall have THHN/THWN insulation, while larger conductors shall have XHHW insulation. Conductors above 600 volts shall be 19-strand copper with EPR insulation. Individual No. 14 AWG conductors shall be used for discrete control circuits, unless it is practical to use multi-conductor cables to group control circuits. Twisted, shielded pair control cable No. 16 AWG with an aluminum Mylar tape shield shall be used for analog signals.

8.4.6.11 Grounding

Load centers shall be bonded to a grounding electrode, which may consist of a building steel column that is bonded to the underground rebar, or a made electrode system (triad or connection to ground loop around the building) and the nearest available effectively grounded metal water pipe. In addition, ground rods shall be driven outside the building to supplement the ground electrode. Grounding electrodes of ground mats or embedded rods and cables shall have a maximum resistance to ground of 5 ohms.

The parts of all electrical equipment, devices, panelboards, and metallic raceways that do not carry current shall be connected to the ground conductors. The transformer neutrals of wye-connected transformers shall be solidly grounded through a grounding conductor connected to the grounding system. A ground wire shall be installed in all raceways that contain power conductors of any voltage.

8.4.6.12 Lighting

Lighting levels in all areas of the plant shall be calculated following the procedures recommended in the Illumination Engineering Society handbook. In general, the minimum foot-candle levels and types of light source shall be as described in Table 39.

Table 39. Lighting Design Criteria

Area	Foot-Candle Levels	Light Source
Office	70	LED
Process, inside (to 15’ ceiling	30	LED
Process, inside (above 15’ ceiling	30	LED
Process, outside	5	LED
General Site	1	LED

8.4.6.13 Lightning Protection

Lightning Protection System shall be provided and installed for the proposed blower building, the main electrical building and as well as for all structures greater than 5 feet above grade level. They system

shall be in compliance with provisions of Code for Lightning Protection Systems as adopted by the National Fire Protection Association and Lightning Protection Institute.

Lightning protection cable shall be Class I copper. Grounding counterpoise shall be as shown. Fittings and straps shall be cast copper. Air terminals shall be copper as required to match roof conductors and shall have proper base support for surface on which they are attached, and shall be securely anchored to this surface. Terminals shall project a minimum of 10 inches above top of object to which attached.

Roof conductors shall consist of copper complying with the weight and construction requirements of the Code, and shall be coursed to interconnect with air terminals, and in general, provide a two-way minimum path to ground. Down conductors shall be copper, concealed within the structure.

Ground connections shall be made in accordance with requirements of all applicable codes. Ground rods shall be placed in a minimum of two feet from building foundations. In addition to above artificial grounds, one down conductor of each two-path system shall be connected to water piping system with approved water pipe type strap connector. All ground rods shall be 3/4-inch. diameter, with a minimum length of 20 feet copperweld type.

9 INSTRUMENTATION

9.1 General

The PICS for the facility will be designed to ensure maximum flexibility of process control together with reliability to ensure process upsets and equipment failures are minimized.

The PICS will be a fully integrated system comprising the following major elements:

- Reliable and accurate field instruments that monitor all appropriate process parameters in real time.
- PLC distributed at key process locations that monitor the parameters measured by the field instruments and automatically control the process equipment to maintain all plant processes.
- A PC based HMI sub-system that provides graphical operator interface with all processes from selected locations throughout the plant.

The following describes the design approach to be followed for each of the above elements.

9.2 Instrumentation Requirements

Field instruments will be furnished to monitor all process parameters necessary to ensure stable and reliable process control. Proposed field instruments are shown on the attached Process and Instrumentation Diagrams.

OCU has developed a listing of standardized field instrument makes and/or models that have proven reliable and maintainable. All field instruments for this facility will be furnished in accordance with those standards.

All field instruments will be furnished with surge protection to protect from damage. Those transmitters and analyzers located outdoors will be pole mounted on an aluminum plate together with the surge protector and AC power breaker. The plates will be also be equipped with sun shields to protect the instruments from excessive heat.

9.3 Control and Monitoring System

In many cases, the process equipment supplier furnishes PLC based control panels. For this plant it is anticipated that this will include the following processes:

- Screens
- Grit removal system
- Activiated Sludge Treatment Trains
- Filters
- GBTs

The need for coordinated plant operation requires that a single experienced and reliable System Supplier be assigned responsibility for overall PICS operation.

9.3.1 PLC/HMI Selection

OCU uses differing makes of PLC in their existing treatment facilities including Siemens S7 and Modicon Quantum. To support ultimate integration system-wide and ensure compatibility between all treatment facilities, it is prudent to standardize on a common PLC platform. OCU has elected to standardize of Siemens.

The design will use the iFIX HMI application software and PLC platform that is planned for the County standard.

9.3.2 PLC Sub-system Configuration

PLC furnished by process equipment suppliers under Division 11 will monitor and control field instruments and process control equipment furnished by them. The main plant PLC will monitor and control all other process operations either through directly connected field I/O or through connection to strategically located remote I/O drops.

The main PLC will be located in the Main Electrical/Standby Generator Building. Remote I/O drops will be located within the other electrical buildings

All PLC and remote I/O drops will be inter-connected using an Ethernet network. All network connections running between buildings will use fiber optic cable to eliminate lightning problems. Motor Control Center and Variable Frequency Drive powered equipment will also be connected to the same network for monitoring and control. The advantage of Ethernet communications for the MCC and VFD is that they can be fully wired and tested at the factory such that following installation only connection of an Ethernet cable is required. Field installation difficulties and problems associated with hard-wiring the equipment to the PLC are thereby minimized.

9.3.3 HMI Sub-system

Operator interface with the plant processes will be provided via a PC based HMI sub-system interconnected by an Ethernet network. This sub-system will be designed to include dual redundant servers rack-mounted within the Administration Building. These servers will independently acquire field data from the PLC-subsystem network with one operating as primary and the other as back-up. In the event the primary server fails, the back-up will automatically take over its role. When operation of the failed server is restored, its database will be automatically updated by the current primary server.

Operators will be provided with PC-based workstations that allow direct interface with the PICS via full color graphic screens. Two workstations will be provided within the SCADA Room. Other workstations will be installed in County selected offices elsewhere in the Administration Building.

Workstations can be fully functional or limited to real time monitoring and control depending upon the HMI license selected. The latter workstations are referred to as “client view” nodes. Any PC may be equipped as a client view node whether on site and connected to the sub-system Ethernet network or remotely via Internet access. Specific PC and license requirements will be selected during the design phase based on County input.

Each remote I/O drop will be equipped with a panel-mounted touch screen providing client view operations for the complete PICS at those locations.

9.4 Equipment Control Modes

All electrically powered process equipment (e.g. pumps. blowers, valves, etc.) will be provided with local, manual controls. However, under normal circumstances, they will be controlled by the associated PLC. The position of these local controls will be monitored by the PLC.

All equipment will be provided with an HMI HAND/OFF/AUTO select switch and, where applicable, a SPEED potentiometer to allow the operators to directly control the process device whenever the local controls are in remote. These HMI switches will duplicate the functions of the local manual switches.

All processes with multiple devices (e.g. primary and standby pump) will use automatic alternation to minimize run times, with automatic calls for the standby issued in the event the primary pump fails to start or fails while running.

9.5 General Control System Requirements

All control system equipment will be provided with industrialized UPS to allow continued operation in the event of a power failure. Power supply and UPS status will be monitored by the PICS.

PLC equipment located within climate-controlled areas will be furnished within NEMA 12 steel enclosures while those located outdoors will be furnished within white painted NEMA 4X stainless steel enclosures equipped with aluminum sun-shields.

All wiring entering or leaving the control panels will be equipped with surge protection devices to protect enclosed equipment from possible lightning induced damage.

9.6 Equipment and Process Control Requirements

9.6.1 Preliminary Treatment

Preliminary treatment operations will be controlled by the Division 11 furnished PLC based control panel.

9.6.1.1 Screens

The band screens will be set to run automatically based on either a differential level controller or a timer. The screens will be in operation intermittently. The differential level controller will be the primary controller and the differential level will be measured by level sensors located upstream and downstream of the screen. When the differential reaches an operator adjustable value or the timer times out, the screen motor and the solenoid valve that controls the non-potable screen wash water will start and run for a preset time.

After the screen is running for a pre-defined amount of time, the washer compactors and sluicing water will be called to run based on a pre-defined sequence of operation. When the screen stops, the washer compactors and wash water will remain energized for a pre-set time, at which point the wash water

solenoid valve will close and the compactor will remain on for a predefined amount of time before powering down.

9.6.1.2 Grit Removal System

Screened wastewater will be fed in to the into the Headcell continuously. Grit slurry from the Headcell will be pumped to the Slurrycup continuously by one of two grit pumps. These pumps will, in common with all primary/standby equipment, automatically alternate and the standby pump will automatically start should the primary fail.

The Slurrycup (grit washing unit) will receive pumped grit from the Headcell continuously. A small volume of washed and classified grit slurry will continuously flow from the Slurrycup. The Hydraulic Valve mounted on the Slurrycup will control the underflow rate. A supply of non-potable water will be continuously introduced to the Hydraulic valve. A backwash sequence will be periodically initiated by cycling solenoid valves. The backwash cycle flushes the grit underflow gap inside the unit. A blowdown sequence is periodically initiated to flush accumulations of debris inside the unit. Blowdown is initiated by cycling solenoid valves that stop the influent to the Slurrycup. When blowdown is finished normal operation is resumed.

The Grit Snail (grit dewatering unit) be in operation whenever grit slurry is being transported to the Grit Snail. Belt speed is adjustable, and a motion sensor will detect movement of the scraper arm. Lack of motion of the scraper arm indicates lack of belt movement or scraper arm drive failure or overload which will signal the Grit Snail to stop if a timer is not reset. While the dewatering unit is running, water will be directed to the tailroll self-cleaning mechanism and grit cleaning system.

9.6.1.3 Odor Control System

The pre-treatment odor control blowers shall be automatically alternated to maintain a continuous exhausting of the pre-treatment structures.

9.6.2 Biological Nutrient Removal

The BNR treatment units will be controlled by the PLC based control panel furnished and programmed by the Division 11 supplier who will therefore determine final control strategies. The following describes the general strategies anticipated.

Operators will define the current operating mode of each of the train's three swing basins via HMI software select switches.

9.6.2.1 Mixers

Mixers in all basins except those currently operating in aerobic or re-aeration mode will run continuously.

9.6.2.2 Blowers

The blowers will run based on an operator selectable total air flow set point for the ASTs. A blower or blowers will be called to run to meet the air flow set point demands. The blower(s) will be automatically controlled to maintain an operator adjustable air flow for the blower.

9.6.2.3 Activated Sludge Treatment Train

Each aerobic and aerobic/anoxic swing zones will be equipped with DO, ammonia, nitrate and ORP probes. An operator adjustable set point will be defined for each for a minimum and maximum value for the parameter measured, along with a starting position for the damper supplying air to the basin. The operator will select which analyzer should be used for control of air to the train. After a preset time the reading will be checked; if the analysis value is at or above the maximum value, the damper will be closed by an operator adjustable percentage, if it is at or below the minimum value, the damper will be opened by an operator adjustable percentage. If the percent open of the modulating air valves are open to less than 10% or greater than 90% then the blowers total airflow setpoint will be adjusted slightly lower or higher respectively.

9.6.2.4 NRCY/IR Pump

The NRCY/IR pumps shall be automatically controlled to maintain an operator adjustable discharge flow. The Each pump will be provided with operator controllable software HAND/OFF/AUTO select switches and a SPEED potentiometer. When set to HAND, the pump will run at the speed set by the potentiometer. When set to OFF, all control commands to the pump will be disabled.

9.6.3 Clarifiers

Clarifiers will be controlled by local manual controls only or by SCADA remote manual controls only.

Scum pumping will be PLC timer controlled, initiated by a remote signal (limit switch) on the clarifier arm and shall operate based on an operator selected time period (30-45 seconds).

9.6.4 RAS / WAS Pumps

RAS pump speed will be controlled to maintain an operator adjustable discharge flow rate.

WAS pumping will be initiated by an operator or when an operator adjustable time of day is reached. The pump's speed will be adjusted to maintain an operator adjustable flow rate until one of the following occurs:

- Operator adjustable pumping time is reached.
- Operator adjustable volume of WAS has flowed.
- Sludge Holding Tanks reach an operator adjustable high level.

9.6.5 Filters

Disc filters will be controlled by the PLC based control panels.

Disc filters will be backwashed whenever the influent level reaches a pre-set high level. Only one filter will be backwashed at a time.

9.6.6 CCTs

Sodium hypochlorite will be dosed based on flow pacing or a compound loop involving flow and chlorine residual. The CCT rapid mixers will run continuously. Chlorine residual will be measured immediately downstream of each rapid mixer, at an intermediate location in each CCT, and in the effluent transfer pump station wet well. pH will also be continuously monitored at the effluent transfer pump station wet well.

9.6.7 Effluent, Reject, and Reclaimed Pumping

This system can operate in reclaimed (PAR), non-PAR or reject mode. In reclaimed (PAR) mode, CCT effluent is pumped to the SWSA PAR system, in non-PAR it is pumped to the influent side of the high service pump station, and in reject it is diverted to the reject ponds. There will be a TSS analyzer at the influent to the CCTs and a chlorine residual analyzer at the effluent end. TSS and chlorine residual are monitored for the purposes of automatic control.

If the TSS concentration is below the setpoint and the Chlorine Residual is above the setpoint the system operates in reclaimed mode. In reclaimed mode, the pumps are controlled to maintain an operator adjustable discharge pressure.
In the event of excess reclaimed water, effluent will be pumped to the GST by the effluent transfer pumps.

The HSPs will pump to either the PAR system or Conserv II RIB system. The position of the motorized valves on the inlet and outlet sides of the station will determine how many pumps are dedicated to each service. Pumps that are valved to the PAR system will operate based on the PAR only operational philosophy.

The HSPs dedicated to Conserv II RIB will seek to maintain a water level bad I the GST as set by the operator. The first priority for water entering the GST is to peed the pumps dedicated to the PAR system. If the water level is declining, indicating excessive demand, the alternative diposal pumps will not energize. If the GST level is within 90% of full tank level , the alternative disposal pumps will energize and seek to maintain the level in the in the GST. If the level continues to rise, indicating declining demand when compared to supply, then more water will be sent to the Conserv I RIB system. if the level in the GST begins to decline indicating increasing demand compared to supply, then the HSPs will pump less to the Conserv II RIB until it drops to an operator selectable value and the GST level is at an operator selectable death then the pumps will turn off.

Since the plant will be unmanned most of the time, the SCADA system will respond automatically to a reduced demand event and shift operation from PAR only to simultaneous PAR-Excess RW Disposal operation. If the system is already operating simultaneously, then it will continue in that mode.

If the TSS concentration raises above to the TSS setpoint flow is automatically diverted from upstream of the filters to the reject pond and there is an alarm. If the Chlorine Residual falls below the setpoint flow is automatically diverted downstream of the CCTs, prior to the effluent pump, to the reject pond. Operations staff can then make a decision as to whether to continue diverting flow to the reject pond until water quality has improved or to send flow through effluent pumping to the high service pump station where it is diverted to the non-PAR system.

The effluent transfer pump station will pump directly into the suction header of the HSP pump station. The HSPs will be controlled based on two parameters including a) transfer pump flow and b) pump inlet pressure. The number and speed of pumps in operation will be determined based on the flow reading from the transfer pump station. The pump operation will be trimmed based on inlet pressure. If the inlet pressure begins to drop (despite a flow match), the pump speed will decrease incrementally to maintain a constant pressure. If the inlet pressure increases, the pump speed will increase incrementally to maintain a constant pressure.

9.6.8 Sludge Holding Tanks

Each SHT will be provided with an operator controllable HMI RECEIVE/ DECANT/ SUPPLY mode select switch. The SHT select switches will be interlocked such that at least one SHT is in the RECEIVE mode.

When a tank is in RECEIVE mode, the influent motorized plug valve is open and the telescoping valves and effluent motorized plug valve are closed. In addition, the associated air blower will run.

When a tank is placed into the DECANT mode the influent and effluent motorized plug valves will be closed. The blower will also be stopped. After an operator adjustable settling time, the telescoping valves will be opened.

When a tank is in SUPPLY mode, the effluent motorized plug valve is open and the telescoping valves and influent motorized plug valve are closed. In addition, the associated air blower will run.

The Sludge Blower shall be automatically controlled to maintain an operator adjustable air flows

9.6.9 Sludge Feed

The Gravity Belt Thickener Feed Pumps will start, change speeds, and stop in conjunction with the gravity belt thickeners. The pumps will feed sludge from the sludge holding tanks to the gravity belt thickeners. The pump will start only after a motorized valve in the sludge holding tank effluent line is fully open so as to allow flow from the selected sludge holding tank. When the pump stops, the tank effluent line valve will close.

The Thickened Residuals Pumps at the GBTs will start, change speeds and stop in conjunction with the gravity belt thickeners. The pumps will transport thickened sludge coming off the gravity belt thickeners to the sludge holding tanks. The pump will start only after a motorized valve in the sludge holding tank

influent line is fully open so as to allow flow to the selected sludge holding tank. When the pump stops, the tank influent line valve will close.

The Thickened Residuals Pumps at the truck loading station will start and stop as required by the truck operator. The pumps will transport thickened sludge from Tanks 3 and 4 to the quick-connect located at the truck loading station. The operator will be able to select the tank which needs to be used to fill the truck, based on the tank level located at the truck loading station. The pump will start only after the motorized valve at the selected thickened sludge tank is fully open. When the pump stops, the motorized valve will close.

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9.6.10 Thickening

Automatic control of the Gravity Belt Thickeners and associated equipment (i.e. Thickener Drive, Thickener Wash Pump, Thickener Backwash Pump) shall be programmed within each Gravity Belt Thickener PLC by the Division 11 supplier. The GBT PLCs shall request to provide operation of the Thickener Feed Pumps, Polymer Skids, and the Thickened Sludge Pumps.

9.6.11 Chemical Pumping Systems

9.6.11.1 Chlorine Feed

The chlorine feed will be determined by an operator adjustable chlorine residual at the CCTs. Operator adjustable setpoints for desired, lower limit and upper limit chlorine residual will be set. The Lead pump will be run at a speed set to an operator adjustable ratio (K) of the total CCT flow. The chlorine residual will be monitored occasionally at an operator adjustable time period. If the residual falls to the lower limit, an alarm will be issued to the operator and the ratio (K) will be increased by an operator adjustable percentage. If the residual rises to the upper limit, an alarm will be issued to the operator and the ratio (K) will be decreased by an operator adjustable percentage.

9.6.11.2 Alum and Carbon Feed

The packaged chemical feed system controls shall allow a smooth and seamless transition between pumps in order to cover the entire chemical flow rate range. The packaged chemical feed system shall vary the chemical flow rate based on input 4-20 mA analog control signals from the external plant wide SCADA system.

10 ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTS

The total cost for Phase I is estimated to be approximately $99.46 million based on 2018 dollars. The detailed costs are prepared and itemized by each major unit. The development of the costs is based on quotations from equipment manufacturers and materials suppliers, as well as recent OCU projects. A summary of the costs is shown in Table 40.

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Table 40. Opinion of Probable Construction Costs

APPENDIX A

Drawings

APPENDIX B

Specifications Table of Contents

APPENDIX C

Technical Memoranda

APPENDIX D

Geotechnical Reports

APPENDIX E

Cloth Disk Filter Evaluation TM

Arcadis U.S., Inc.

2301 Maitland Center Parkway

Suite 244

Maitland, Florida 32751-7414

Tel 407 660 1133

Fax 407 660 9550

www.arcadis.com

CONTRACT

Y20-812

THIS CONTRACT made and entered into this _____ day of _____ 20___, by and between the:

BOARD OF COUNTY COMMISSIONERS
201 S. Rosalind Avenue
Orlando, Orange County, Florida

a political subdivision of the State of Florida, hereinafter referred to as "COUNTY" and:

>_____
>_____
>_____
FEDERAL I. D. # >_____

hereinafter referred to as "CONSULTANT".

RECITALS

WHEREAS, the COUNTY desires to retain professional consulting services for ENGINEERING SERVICES FOR HAMLIN WATER RECLAMATION FACILITY PHASE 2 IMPROVEMENTS

WHEREAS, the COUNTY desires to employ the CONSULTANT in connection with the services required, upon the terms and conditions hereinafter set forth, and the CONSULTANT is desirous of obtaining such employment and of performing such services upon said terms and conditions;

NOW, THEREFORE, in consideration of the mutual covenants and agreements hereinafter contained, it is agreed by and between the parties hereto as follows:

I
SCOPE OF SERVICES/SPECIAL PROVISIONS

The CONSULTANT shall diligently and in a timely manner perform professional services for Orange County in connection with the ENGINEERING SERVICES FOR HAMLIN WATER RECLAMATION FACILITY PHASE 2 IMPROVEMENTS Project. The scope of services/special provisions is described in Exhibit A, Scope of Services, entitled, "ENGINEERING SERVICES FOR HAMLIN WATER RECLAMATION FACILITY PHASE 2 IMPROVEMENTS", which is attached to this Contract, and incorporated by reference herein. Any and all scope of services/special provisions hereto which vary from the general provisions shall have precedence. Any and all drawings shall have precedence over written specifications.

II
PAYMENT

A. **FEES**: The COUNTY agrees to pay the CONSULTANT for the services described in Exhibit A, a >lump sum of >fee not to exceed $>_____said compensation to be paid as set forth herein. Payment shall be based upon method(s) established at time of award.

B. **PAYMENTS**: The COUNTY shall pay the CONSULTANT in accordance with the Florida Local Government Prompt Payment Act, Chapter 218, Florida Statutes.

Progress payments shall be due and payable monthly in proportion to the percentage of work approved and accepted, in writing, by the COUNTY. All invoices shall be prepared in the format prescribed by the COUNTY. When an invoice includes charges from a subconsultant, the subconsultant's invoice/backup shall accompany the CONSULTANT'S invoice. A separate Pay Item Breakdown sheet for the CONSULTANT and each subconsultant shall accompany each invoice. The CONSULTANT'S Pay Item Breakdown sheet shall include, in aggregate, the CONSULTANT'S and subconsultant's pay items. All requests for payment must be accompanied by a narrative description of the scope of services from Exhibit A performed by the CONSULTANT and subconsultants during the period covered by the invoice. The narrative shall also describe the work to be performed during the next billing period. See additional requirements regarding M/WBE subconsultants specified in Article XIII-D.

C. **SUSPENSION OF PROGRESS PAYMENTS BY COUNTY**: In the event the CONSULTANT falls fifteen (15%) percent behind the Project completion schedule submitted in conformance with Article XI, Paragraph B of this Contract, no further progress payments will be made until the CONSULTANT brings the Project back on schedule or a revised schedule is submitted and approved or until all work has been completed and accepted the COUNTY.

D. **PAYMENT IN EVENT OF TERMINATION BY COUNTY**: In the event this Contract is terminated or canceled prior to completion, payment shall be made in accordance with the provisions of Article VII.

E. **CHANGES WITHIN SCOPE; ALLOWANCE OF ADDITIONAL COMPENSATION**: If instructed to do so by the COUNTY, the CONSULTANT shall change or revise work that has been performed, and if such work is not required as a result of error, omission or negligence of the CONSULTANT, the CONSULTANT may be entitled to additional compensation. In all disputes arising over the right to additional compensation, the COUNTY shall determine whether substantial acceptable work has been done on documents such that changes, revisions or preparation of additional documents should result in additional compensation to the CONSULTANT. The Consultant's Proposals for additional compensation shall be based on the fee schedule set forth in Exhibit B. A written modification to the Contract shall be executed by both parties to reflect the additional services and cost of same, prior to commencement of performance.

F. **TRAVEL AND PER DIEM**: Travel and per diem charges shall not exceed the limits as set forth in Section 112.061 Florida Statute, and Exhibit C, attached.

G. **FEE LIMITATION CLAUSE**: The CONSULTANT shall utilize the same hourly rates and multiplier in fee negotiations for subsequent phases of this project, except as provided by Article II, paragraph I, Price Adjustment. The number of hours required to complete each subsequent phase shall be negotiated at such time as the COUNTY initiates fee negotiations for that phase.

H. **MULTIPLIERS**

The following multipliers are applicable to this contract and shall remain in effect and unchanged for the duration of the contract, including any extensions thereto:

1.	Prime Consultant	Multiplier
	>	>
2.	Sub-Consultants	Multiplier
	>	**>**
	>	>

I. **PRICE ADJUSTMENT**

Written request for a price adjustment may be made only under the following conditions:

i. If a project specific contract's performance period exceeds three years a price adjustment may be requested not more than 60 days after the end of the three year period and for each annual period thereafter or for the remaining period of the contract if less than one year.

ii For continuing contracts with a performance period that exceeds three years, an adjustment may be requested not more than 60 days after the end of three years.

iii Retroactive requests for price adjustments will not be considered.

The provisions of this clause shall not apply to contracts with fees based on ranges. Retroactive requests for price adjustments will not be considered.

Any request for a price adjustment will be subject to negotiation and must be approved by the Manager, Procurement Division. Any request for such increase shall be supported by adequate justification to include Consumer Price Index (CPI) documentation. The CPI documentation shall be based on the All Items, CPI-U, U.S. City Average, not seasonally adjusted index. The prevailing CPI in the month when the contract was executed by the County shall be the base period from which changes in the CPI will be measured for the initial request for a price adjustment. Any subsequent requests for a price adjustment shall be based on the CPI prevailing in the month when an amendment effecting a previous price adjustment was executed by the County.

The maximum allowable increase shall not exceed the percent change in the CPI from the base period (either the month when the contract was executed by the County or the month when an amendment effecting a price adjustment was executed by the County) to the CPI prevailing at time of request for a price adjustment and in no case shall it exceed 4%. Any price adjustment shall only be effective upon the execution of a written amendment to the contract executed by both parties.

III
DESIGN WITHIN FUNDING LIMITATIONS

A. The CONSULTANT shall accomplish the design services required under this Contract, when applicable, so as to permit the award of a contract (using standard Orange County procedures for the construction of the facilities) at a price that does not exceed the estimated construction contract price as set forth in paragraph C below. When bids or Proposals for the construction contract are received that exceed the estimated price, the CONSULTANT shall perform such redesign and other services as are necessary to permit contract award within the funding limitation. These additional services shall be performed at no increase in the price of this Contract.

However, the CONSULTANT shall not be required to perform such additional services at no cost to the COUNTY if the unfavorable bids or Proposals result from conditions beyond the CONSULTANT'S reasonable control. The COUNTY shall exercise reasonable commercial judgment in making the controlling determinations as to whether such conditions are within the reasonable control of the CONSULTANT.

B. The CONSULTANT will promptly advise the COUNTY if it finds that the project being designed will exceed or is likely to exceed the funding limitations and it is unable to design a usable facility within these limitations. Upon receipt of such information, the COUNTY will review the CONSULTANT'S revised estimate of construction cost. The COUNTY may, if it determines that the estimated construction contract price set forth in this Contract is so low that award of a construction contract not in excess of such estimate is improbable, authorize a change in scope or materials as required to reduce the estimated construction cost to an amount within the estimated construction contract price set forth in paragraph C below, or the COUNTY may adjust such estimated construction contract price via amendment to this Contract. When bids or Proposals are not solicited or are unreasonably delayed, the COUNTY shall prepare an estimate of constructing the design submitted and such estimate shall be used in lieu of bids or Proposals to determine compliance with the funding limitation.

C. The estimated construction contract price for the project described in this Contract is $60,000,000, or as modified by the County.

D. THE CONSULTANT and its subsidiaries or affiliates who designed the project shall be ineligible for the award of the construction contract for that project.

IV
RESPONSIBILITY OF THE CONSULTANT

A. The CONSULTANT shall be responsible for the professional quality, technical accuracy, and the coordination of all designs, drawings, specifications, and other services furnished by the CONSULTANT under this Contract. The CONSULTANT shall, without additional compensation, correct or revise any errors or deficiencies in its designs, drawings, specifications, and other services.

B. The Project Manager and the Project Engineer must be two separate individuals. Both must be professional engineers registered in the State of Florida. >The Project Manager and the Project Engineer may be the same individual, who must be a professional >engineer >architect registered in the State of Florida.

C. Substitution of the Project Manager, Project Engineer or Other Key Personnel: The CONSULTANT shall not substitute any key personnel without the prior written approval of the Manager of the Procurement Division. Any such requests shall be supported by comprehensive documentation outlining the reason(s) for the proposed substitution to include the specific qualifications of the proposed substitute. Approval of the request shall be at the discretion of the COUNTY. Further, the COUNTY, in lieu of approving a substitution, may initiate other actions under the contract, including termination.

D. Neither the COUNTY'S review, approval or acceptance of, nor payment for, the services required under this Contract shall be construed to operate as a waiver of any rights under this Contract or of any cause of action arising out of the performance of this Contract, and the CONSULTANT shall be and remain liable to the COUNTY in accordance with applicable law for all damages suffered directly or indirectly by the COUNTY caused by the CONSULTANT'S negligent performance of any of the services furnished under this Contract. The rights and remedies of the COUNTY provided for under this Contract are in addition to any other rights and remedies provided by law.

E. If the CONSULTANT is comprised of more than one legal entity, each such entity shall be jointly and severally liable hereunder.

F. The COUNTY may require in writing that the CONSULTANT remove from the Work any of the CONSULTANT'S personnel that the COUNTY determines to be incompetent, careless or otherwise objectionable. No claims for an increase in Contract Amount or Contract Time based on the COUNTY's use of this provision will be valid. CONSULTANT shall indemnify and hold the County harmless from and against any claim by CONSULTANT'S personnel on account of the use of this provision.

G. For contracts requiring design services, the CONSULTANT shall comply with the following requirements:

1. Concurrent with submission of the 90% design submittal to the user division, the CONSULTANT shall provide a copy to the Procurement Division, 400 E. South St., 2nd Floor, Orlando, FL 32801

2. Concurrent with the submission of the 100% design submittal to the user division, the CONSULTANT shall submit a complete breakdown of the subcontracting opportunities for the project based on traditional industry practices and their expertise to the Business Development Division, 400 E. South St., Orlando, FL 32801. This information will identify subcontracting elements such as electrical, trucking, sodding, surveying, etc. with the estimated percentage of the total project represented by each subcontracting element.

3. Direct Purchases: For projects for which construction is valued at $10,000,000, or for lesser amounts as determined by the COUNTY, the COUNTY may, at its discretion, use the direct purchase method for large dollar value equipment and materials. The CONSULTANT shall, for those projects meeting this criterion, identify all items to be incorporated into the work for which the estimated cost is $100,000 or more, for potential direct purchase by the COUNTY. A separate listing of these items with quantities and estimated cost shall be provided with the 90% design documents to the user division and to the Procurement Division at address shown above.

V
COUNTY'S RIGHTS AND RESPONSIBILITIES

The COUNTY shall:

A. Furnish the CONSULTANT with existing data, plans, profiles, and other information necessary or useful in connection with the planning of the program that is available in the COUNTY'S files, all of which shall be and remain the property of the COUNTY and shall be returned to the COUNTY upon completion of the services to be performed by the CONSULTANT.

B. Make COUNTY personnel available on a time-permitting basis, where required and necessary to assist the CONSULTANT. The availability and necessity of said personnel to assist the CONSULTANT shall be determined solely within the discretion of the COUNTY.

VI
COUNTY'S 'DESIGNATED' REPRESENTATIVE

It is understood and agreed that the COUNTY designates the COUNTY Administrator, or designated representative, to represent the COUNTY in all technical matters pertaining to and arising from the work and performance of this Contract. The COUNTY Administrator, or designated representative, shall have the following responsibilities:

A. Examination of all reports, sketches, drawings, estimates, Proposals, and other documents presented by the CONSULTANT and rendering, in writing, decisions indicating the COUNTY'S approval or disapproval within a reasonable time so as not to materially delay the work of the CONSULTANT.

B. Transmission of instructions, receipt of information, and interpretation and definition of COUNTY policies and decisions with respect to design, materials and other matters pertinent to the work covered by this Contract.

C. Prompt written notice by the COUNTY to the CONSULTANT whenever the COUNTY observes, or otherwise becomes aware of, any defects or changes necessary in the Project.

VII
TERMINATION OF CONTRACT

A. TERMINATION FOR DEFAULT:

The County may, by written notice to the CONSULTANT, terminate this contract for default in whole or in part (task authorizations, if applicable) if the CONSULTANT fails to:

1. provide products or services that comply with the specifications herein or fails to meet the County's performance standards
2. deliver the supplies or to perform the services within the time specified in this contract or any extension.
3. make progress so as to endanger performance of this contract
4. perform any of the other provisions of this contract.

Prior to termination for default, the County will provide adequate written notice to the CONSULTANT through the Manager, Procurement Division, affording him/her the opportunity to cure the deficiencies or to submit a specific plan to resolve the deficiencies within ten (10) days (or the period specified in the notice) after receipt of the notice. Failure to adequately cure the deficiency shall result in termination action. Such termination may also result in suspension or debarment of the CONSULTANT in accordance with the County's Procurement Ordinance. The CONSULTANT shall be liable for any damage to the County resulting from the Consultant's default of the contract. This liability includes any increased costs incurred by the County in completing contract performance.

In the event of termination by the County for any cause, the CONSULTANT will have, in no event, any claim against the County for lost profits or compensation for lost opportunities. After a receipt of a Termination Notice and except as otherwise directed by the County the CONSULTANT shall:

1. Stop work on the date and to the extent specified.
2. Terminate and settle all orders and subcontracts relating to the performance of the terminated work
3. Transfer all work in process, completed work, and other materials related to the terminated work as directed by the County.
4. Continue and complete all parts of that work that have not been terminated.

If the CONSULTANT'S failure to perform the contract arises from causes beyond the control and without the fault or negligence of the CONSULTANT, the contract shall not be terminated for default. Examples of such causes include (1) acts of God or the public enemy, (2) acts of a government in its sovereign capacity, (3)

fires, (4) floods, (5) epidemics, (6) strikes and (7) unusually severe weather.

B. TERMINATION FOR CONVENIENCE:

The County, by written notice, may terminate this contract, in whole or in part, when it is in the County's interest. If this contract is terminated, the County shall be liable only for goods or services delivered and accepted. The County Notice of Termination shall provide the Consultant thirty (30) days prior notice before it becomes effective. A termination for convenience may apply to individual purchase orders or to the contract in its entirety.

C. PAYMENT IN EVENT OF TERMINATION:

If this Contract is terminated before performance is completed, the CONSULTANT shall be paid for the work satisfactorily performed. Payment is to be on the basis of substantiated costs, not to exceed an amount that is the same percentage of the Contract price as the amount of work satisfactorily completed is a percentage of the total work called for by the Contract. Any additional costs incurred by the COUNTY as a result of such termination shall be deducted from the amount due the CONSULTANT, in the event the Contract termination is for cause as described herein.

D. TERMINATION NOTICE

The Manager, Procurement Division, shall issue any and all notices involving termination of this contract.

VIII
INDEMNITY/INSURANCE AND SAFETY REQUIREMENTS

Consultant agrees to maintain on a primary basis and at its sole expense, at all times throughout the duration of this contract the following types of insurance coverage with limits and on forms (including endorsements) as described herein. These requirements, as well as the County's review or acceptance of insurance maintained by Consultant is not intended to and shall not in any manner limit or qualify the liabilities assumed by Consultant under this contract. Consultant is required to maintain any coverage required by federal and state workers' compensation or financial responsibility laws including but not limited to Chapter 324 and 440, Florida Statutes, as may be amended from time to time.

The Consultant shall require and ensure that each of its sub-consultants providing services hereunder (if any) procures and maintains until the completion of their respective services, insurance of the types and to the limits specified herein.

Insurance carriers providing coverage required herein must be licensed to conduct business in the State of Florida and must possess a current A.M. Best's Financial Strength Rating of A- Class VIII or better.
(Note: State licenses can be checked via www.floir.com/companysearch/ and A.M. Best Ratings are available at www.ambest.com)

Required Coverage:

☒ Commercial General Liability - The Consultant shall maintain coverage issued on the most recent version of the ISO form as filed for use in Florida or its equivalent, with a limit of liability of not less than $1,000,000 per occurrence. Consultant further agrees coverage shall not contain any endorsement(s) excluding or limiting Product/Completed Operations, Contractual Liability, or Separation of Insureds. The General Aggregate limit shall either apply separately to this contract or shall be at least twice the required occurrence limit.

Required Endorsements:
☒ Additional Insured- CG 20 26 or CG 20 10/CG 20 37 or their equivalents.
Note: CG 20 10 must be accompanied by CG 20 37 to include products/completed operations
☒ Waiver of Transfer of Rights of Recovery- CG 24 04 or its equivalent.
Note: If blanket endorsements are being submitted please include the entire endorsement and the applicable policy number.

☒ Business Automobile Liability - The Consultant shall maintain coverage for all owned; non-owned and hired vehicles issued on the most recent version of the ISO form as filed for use in Florida or its equivalent, with limits of not less than $500,000 (five hundred thousand dollars) per accident. In the event the Consultant does not own automobiles the Consultant shall maintain coverage for hired and non-owned auto liability, which may be satisfied by way of endorsement to the Commercial General Liability policy or separate Business Auto Liability policy.

☒ Workers' Compensation - The Consultant shall maintain coverage for its employees with statutory workers' compensation limits, and no less than $100,000 each incident of bodily injury or disease for Employers' Liability. Elective exemptions as defined in Florida Statute 440 will be considered on a case-by-case basis. Any Consultant using an employee leasing company shall complete the Leased Employee Affidavit.

Required Endorsements:
☐ Waiver of Subrogation- WC 00 03 13 or its equivalent

☒ Professional Liability- with a limit of not less than $1,000,000 per occurrence/claim

When a self-insured retention or deductible exceeds $100,000 the COUNTY reserves the right to request a copy of Consultant most recent annual report or audited financial statement. For policies written on a “Claims-Made” basis the Consultant agrees to maintain a retroactive date prior to or equal to the effective date of this contract. In the event the policy is canceled, non-renewed, switched to occurrence form, or any other event which triggers the right to purchase a Supplemental Extended Reporting Period (SERP) during the life of this contract the Consultant agrees to purchase the SERP with a minimum reporting period of not less than two years. Purchase of the SERP shall not relieve the Consultant of the obligation to provide replacement coverage.

By entering into this contract Consultant agrees to provide a waiver of subrogation or a waiver of transfer of rights of recovery, in favor of the County for the workers' compensation and general liability policies as required herein. When required by the insurer or should a policy condition not permit the Consultant to enter into a pre-loss agreement to waive subrogation without an endorsement, then Consultant agrees to notify the insurer and request the policy be endorsed with a Waiver of Subrogation or a Waiver of Transfer of Rights of Recovery Against Others endorsement.

Prior to execution and commencement of any operations/services provided under this contract the Consultant shall provide the COUNTY with current certificates of insurance evidencing all required coverage. In addition to the certificate(s) of insurance the Consultant shall also provide endorsements for each policy as specified above. All specific policy endorsements shall be in the name of the Orange County Board of County Commissioners.

For continuing service contracts renewal certificates shall be submitted immediately upon request by either the COUNTY or the COUNTY's contracted certificate compliance management firm. The certificates shall clearly indicate that the Consultant has obtained insurance of the type, amount and classification as required for strict compliance with this insurance section. Consultant shall notify the COUNTY not less than thirty (30) business days (ten business days for non-payment of premium) of any material change in or cancellation/non-renewal of insurance coverage. The Consultant shall provide evidence of replacement coverage to maintain compliance with the aforementioned insurance requirements to the COUNTY or its certificate management representative five (5) business days prior to the effective date of the replacement policy (ies).

The certificate holder shall read:

Orange County, Florida
c/o Procurement Division
400 E. South Street
Orlando, Florida 32801

INDEMNIFICATION- CONSULTANTS:

The CONSULTANT to the extent permitted in Section 725.08, Florida Statutes shall indemnify and hold harmless the COUNTY and its officers and employees from liabilities damages, losses, and costs (including attorney's fees) to the extent caused by the negligence, recklessness, or intentionally wrongful conduct of the CONSULTANT and persons employed or utilized by the CONSULTANT in the performance of this Contract. The remedy provided to the COUNTY by this paragraph shall be in addition to and not in lieu of any other remedy available under this Contract or otherwise and shall survive the termination of this Contract.

SAFETY AND PROTECTION OF PROPERTY (for services provided on the premises of Orange County)

The Consultant shall at all times:

- Initiate, maintain and supervise all safety precautions and programs in connection with its services or performance of its operations under this contract.

- Take all reasonable precautions to prevent injury to employees, including County employees and all other persons affected by their operations.

- Take all reasonable precautions to prevent damage or loss to property of Orange County, or of other vendors, consultants or agencies and shall be held responsible for replacing or repairing any such loss or damage.

- Comply with all ordinances, rules, regulations, standards and lawful orders from authority bearing on the safety of persons or property or their protection from damage, injury or loss. This includes but is not limited to:

    - Occupational Safety and Health Act (OSHA)
    - National Institute for Occupational Safety & Health (NIOSH)
    - National Fire Protection Association (NFPA)
    - American Society of Heating, Refrigeration & Air-Conditioning Engineers (ASHRAE)

- The Consultant must also comply with the guidelines set forth in the Orange County Safety & Health Manual. The manual can be accessed online at the address listed below:

    http://www.orangecountyfl.net/VendorServices/OrangeCountySafetyandHealthManual.aspx

IX
TRUTH IN NEGOTIATION AND MAINTENANCE AND EXAMINATION OF RECORDS

A. The Consultant hereby represents, covenants and warrants that wage rates and other factual unit costs supporting the compensation provided for in this Contract are accurate, complete and current as of the date of contracting. It is further agreed that the Contract price shall be adjusted to exclude any amounts where the County determines the Contract price was increased due to inaccurate, incomplete or non-current wage rates and other factual unit costs.

B. The Consultant shall keep adequate records and supporting documents applicable to this Contract. Said records and documentation shall be retained by the Consultant for a minimum of five (5) years from the date of final payment on this contract. If any litigation, claim or audit is commenced prior to the expiration of the five (5) year period, the records shall be maintained until all litigation, claims or audit findings involving the records have been resolved.

C. If applicable, time records and cost data shall be maintained in accordance with generally accepted accounting principles.

This includes full disclosure of all transactions associated with the contract. Also, if applicable, all financial information and data necessary to determine overhead rates in accordance with Federal and State regulatory agencies and the contract shall be maintained.

D. The Consultant's "records and supporting documents" as referred to in this Contract shall include any and all information, materials and data of every kind and character, including without limitation, records, books, papers, documents, subscriptions, recordings, agreements, purchase orders, invoices, leases, contracts, commitments, arrangements, notes, daily diaries, superintendent reports, drawings, receipts, vouchers and memoranda, and any and all other agreements, sources of information and matters that may in the County's judgment have any bearing on or pertain to any matters, rights, duties or obligations under or covered by any Contract document.

Such records and documents shall include (hard copy, as well as computer readable data, written policies and procedures; time sheets; payroll registers; cancelled checks; subcontract files (including proposals of successful and unsuccessful bidders, bid recaps, etc.); original estimates; estimating worksheets; correspondence; change order files (including pricing data used to price change proposals and documentation covering negotiated settlements); back-charge logs and supporting documentation; general ledger entries detailing cash and trade discounts earned, insurance rebates and dividends; and any other Consultant records which may have a bearing on matters of interest to the County in connection with the Consultant's dealings with the County (all foregoing hereinafter referred to as "records and supporting documents") to the extent necessary to adequately permit evaluation and verification of:

1) Consultant compliance with contract requirements; or
2) Compliance with provisions for pricing change orders; or
3) Compliance with provisions for pricing invoices; or
4) Compliance with provisions regarding pricing of claims submitted by the Consultant or his payees; or
5) Compliance with the County's business ethics; or
6) Compliance with applicable state statutes and County Ordinances and regulations.

E. Records and documents subject to audit shall also include those records and documents necessary to evaluate and verify direct and indirect costs, (including overhead allocations) as they may apply to costs associated with this Contract. In those situations where Consultant's records have been generated from computerized data (whether mainframe, mini-computer, or PC based computer systems), Consultant agrees to provide the County's representatives with extracts of data files in computer readable format on data disks or suitable alternative computer exchange formats.

F. The County and its authorized agents shall have the right to audit, inspect and copy records and documentation as often as the County deems necessary throughout the term of this contract and for a period of five (5) years after final payment. Such activity shall be conducted during normal business working hours. The County, or any of its duly authorized representatives, shall have access within forty-eight (48) hours to such books, records, documents, and other evidence for inspection, audit and copying.

G. The County, during the period of time defined by the preceding paragraph, shall have the right to obtain a copy of and otherwise inspect any audit made at the direction of the Consultant as concerns the aforesaid records and documentation.

H. Records and documentation shall be made accessible at the Consultant's local place of business. If the records are unavailable locally, it shall be the Consultant's responsibility to insure that all required records are provided at the Consultant's expense including payment of travel and maintenance costs incurred by the County's authorized representatives or designees in accessing records maintained out of the county. The direct costs of copying records, excluding any overhead cost, shall be at the County's expense.

I. Consultant shall require all payees (examples of payees include sub Consultants, insurance agents, material suppliers, etc.) to comply with the provisions of this article by including the requirements hereof in a written contract agreement between Consultant and payee. Such requirements include a flow-down right of audit provisions in contracts with payees, which shall also apply to Sub Consultants and Sub-sub Consultants, material suppliers, etc. Consultant shall cooperate fully and shall cause all aforementioned parties and all of Consultant's sub Consultants (including those entering into lump sum subcontracts and lump sum major material purchase orders) to cooperate fully in furnishing or in making available to the County from time to time whenever requested in an expeditious manner any and all such records, documents, information, materials and data.

J. The County's authorized representatives or designees shall have reasonable access to the Consultant's facilities, shall be allowed to interview all current or former employees to discuss matters pertinent to the performance of this Contract and shall have adequate and appropriate work space, in order to conduct audits in compliance with this article.

K. Even after a change order proposal has been approved, Consultant agrees that if the County later determines the cost and pricing data submitted was inaccurate, incomplete, not current or not in compliance with the terms of the Contract regarding pricing of change orders, then an appropriate contract price reduction will be made. Such post-approval contract price adjustment will apply to all levels of Consultants and/or sub Consultants and to all types of change order proposals specifically including lump sum change orders, unit price change orders, and cost-plus change orders.

L. If an audit inspection or examination by the County, or its designee, in accordance with this article discloses overpricing or overcharges (of any nature) by the Consultant to the County in excess of one-half of one percent (.5%) of the total contract billings, the reasonable actual cost of the County's audit shall be reimbursed to the County by the Consultant. Any adjustments and /or payments that must be made as a result of any such audit or inspection of the Consultant's invoices and/or records and supporting documents shall be made within a reasonable amount of time (not to exceed 90 days) from presentation of the County's findings to the Consultant.

X
OWNERSHIP OF DOCUMENTS

It is understood and agreed that all documents, including detailed reports, plans, original drawings, survey field notebooks, and all other data other than working papers, prepared or obtained by the CONSULTANT in connection with its services hereunder and are the property of the COUNTY upon acceptance of same by the COUNTY.

XI
WORK COMMENCEMENT/PROGRESS/DELAYS

A. **COMMENCEMENT AND TERM OF JOB**: The services to be rendered by the CONSULTANT shall be commenced subsequent to the execution of this Contract and upon written notice to proceed from the Department Director or designee. Services shall be completed within 1,825 days after Notice to Proceed.

B. **JOB SEGMENT DEADLINES**: A detailed segment completion schedule has been approved by the COUNTY. Said segment completion schedule is attached hereto as Exhibit D and made a part hereof by this reference. The purpose of this schedule is to:

1. Provide job segment deadlines for the CONSULTANT upon which the COUNTY may rely;
2. Provide guidance for the COUNTY in honoring the CONSULTANT'S monthly invoices for progress payments called for in Article II(B) hereof; and
3. Provide a framework against which the COUNTY may suspend progress payments as provided in Article II C hereof.

C. **CONFERENCES**: The COUNTY will be entitled at all times to be advised, at its request, as to the status of work being done by the CONSULTANT and of the details thereof. Coordination shall be maintained by the CONSULTANT with representatives of the COUNTY, or of other agencies interested in the Project on behalf of the COUNTY. Either party to the Contract may request and be granted a conference.

D. **DELAYS NOT FAULT OF CONSULTANT; DISCRETIONARY EXTENSIONS OF COMPLETION TIME BY COUNTY**: In the event there are delays on the part of the COUNTY as to the approval of any of the materials submitted by the CONSULTANT, or if there are delays occasioned by circumstance beyond the control of the CONSULTANT which delay the Project Schedule completion date, the COUNTY may grant to the CONSULTANT, by "Letter of Approval of Project Schedule" an extension of the Contract time or revision to the Project Schedule, equal to the aforementioned delays, provided there are no changes in compensation or scope of work. It shall be the responsibility of the CONSULTANT to ensure at all times that sufficient Contract time remains within which to complete services on the Project. In the event there have been delays which would affect the Project completion date, the CONSULTANT shall submit a written request to the COUNTY which identifies the reason(s) for the delay and the amount of time related to each reason.

The COUNTY will review the request and make a determination as to granting all or part of the requested extension.

E. **SUSPENSION OF WORK BY COUNTY**:

1. Right of COUNTY to Suspend Work and Order Resumption – The performance of CONSULTANT'S services hereunder may be suspended by the COUNTY at any time. However, in the event the COUNTY suspends the performance of CONSULTANT'S services hereunder, it shall so notify the CONSULTANT in writing, such suspension becoming effective upon the date of its receipt by CONSULTANT. The COUNTY shall promptly pay to the CONSULTANT all fees which have become due and payable to the CONSULTANT prior to the effective date of such suspension. COUNTY shall thereafter have no further obligation for payment to the CONSULTANT unless and until the COUNTY notifies the CONSULTANT that the services of the CONSULTANT called for hereunder are to be resumed. Upon receipt of written notice from the COUNTY that CONSULTANT'S services hereunder are to be resumed, CONSULTANT shall complete the services of CONSULTANT called for in This Contract and CONSULTANT, shall, in that event, be entitled to payment of the remaining unpaid compensation which becomes payable to him under this Contract, same to be payable in the manner specified herein.

   In no event will the compensation or any part thereof become due or payable to CONSULTANT under this Contract unless and until CONSULTANT has attained that stage of work where the same would be due and payable to CONSULTANT under the provision of this Contract.

2. Renegotiation by CONSULTANT; Right to Terminate – If the aggregate time of the COUNTY'S suspension or suspension of CONSULTANT'S services exceeds one hundred twenty (120) days, then CONSULTANT and COUNTY shall, upon request of CONSULTANT, meet to assess the services remaining to be performed and the total fees paid to CONSULTANT hereunder.

The parties shall then have the opportunity of negotiating a change in fees to be paid to the CONSULTANT for the balance of the services to be performed hereunder. No increase in fees to the CONSULTANT shall be allowed unless based upon clear and convincing evidence of an increase in CONSULTANT'S costs attributable to the aforesaid suspensions. If an increase in the CONSULTANT'S cost is demonstrated by clear and convincing evidence and the COUNTY refuses to increase said fees, CONSULTANT may terminate this Contract by delivering written notice thereof to the COUNTY within ten (10) days after the COUNTY has given notice of its refusal to increase said fees.

XII
STANDARDS OF CONDUCT

A. The CONSULTANT represents that he has not employed or retained any company or person, other than a bona fide employee working solely for the CONSULTANT, to solicit or secure this Contract and that he has not paid or agreed to pay any person, company, corporation, individual or firm other than a bona fide employee working solely for the CONSULTANT any fee, commission, percentage, gift or any other consideration, contingent upon or resulting from the award of this Contract.

B. The CONSULTANT shall comply with all Federal, State and local laws and ordinances in effect on the date of this Contract and applicable to the work or payment for work thereof, and shall not discriminate on the grounds of race, religion, sex, sexual orientation and gender expression/identity, color, age, disability or national origin in the performance of work under this Contract.

C. The CONSULTANT hereby certifies that no undisclosed conflict of interest exists with respect to the present Contract, including any conflicts that may be due to representation of other clients, other contractual relationships of the CONSULTANT, or any interest in property which the CONSULTANT may have. The CONSULTANT further certifies that any apparent conflict of interest that arises during the term of this Contract will be immediately disclosed in writing to the COUNTY. Violation of this section will be considered as justification for immediate termination of this Contract under the provisions of Article VII.

D. The CONSULTANT and its subsidiaries or affiliates who designed the project, shall be ineligible for the award of the construction contract for that project.

XIII
MINORITY/WOMEN EMPLOYMENT PARTICIPATION

A. The CONSULTANT shall be responsible for reporting Minority/Women Business Enterprise (M/WBE) subconsultant Contract dollar amount(s) for the M/WBE subconsultant(s) listed in this document, by submitting the appropriate documents, which shall include but not limited to fully executed sub-contract agreements and/or purchase orders evidencing contract award of work, to the Business Development Division. Submittal of these sub-contract agreements/purchase orders is a condition precedent to execution of the prime contract with the County. Quarterly updated M/WBE utilization reports and

Equal Opportunity Workforce Schedule reports are to be submitted every quarter during the term of the contract. Additionally, the Consultant shall ensure that the M/WBE participation percentage proposed in the Consultant's Proposal submitted for this Contract is accomplished.

B. Subsequent amendments to this contract shall be submitted with the appropriate documentation evidencing contractual change or assignment of work to the Business Development Division, with a copy to the COUNTY'S designated representative, within ten (10) days after COUNTY'S execution.

C. The CONSULTANT shall be responsible for reporting local minority/women employment percentage levels within the firm and the minority/women employment percentage levels that the firm anticipates utilizing to fulfill the obligations of this Contract. The report(s) shall be submitted to the Business Development Division, on a quarterly basis during the life of the Contract.

D. The awarded prime consultant shall furnish written documentation evidencing actual dollars paid to **all sub-consultants** utilized by the prime consultant on the project. This will include, but not limited to: copies of cancelled checks, approved invoices, and signed affidavits certifying the accuracy of payments so that the County may determine actual MWBE participation achieved by the Prime Consultant prior to the issuance of final payment.

E. The awarded prime consultant shall not substitute, replace or terminate any M/WBE firm without prior written authorization from the Business Development Manager. In the event a certified M/WBE sub-consultant's sub-contract is terminated for cause, the CONSULTANT shall justify the replacement of that sub-consultant with another certified M/WBE firm, in writing to the Business Development Division, accompanied by the Project Manager's recommendation.

F. It is the intent of the COUNTY to insure prompt payment of all sub-consultants working on COUNTY projects. The CONSULTANT shall:

1. Submit copies of executed contracts between the CONSULTANT and all of its M/WBE sub-consultants to the Business Development Division.

2. The County may at its discretion require copies of subcontracts/purchase orders for the non-M/WBE's listed on Form B and or utilized on the project. However, if this option is <u>not</u> exercised the awarded Proposer shall provide a list of all non-M/WBE sub consultants certifying that a prompt payment clause has been included in that contract or purchase order.

3. The Consultant **must i**nclude in the subcontract agreement:

   i. Prompt Payment Clause to the M/WBE sub consultant to state: "payment will be made to the sub-consultant/suppliers within 72 hours of receipt of payment from the County."
   ii. The following statement: "It is the M/WBE's responsibility to submit the required Quarterly M/WBE utilization reports to the prime and Final

M/WBE payment verification form to Business Development Division denoting their percentage of the overall contract fees."

The M/WBE's failure to submit the required documents could negatively impact their M/WBE certification.

F. By entering into this contract, the CONSULTANT affirmatively commits to comply with the M/WBE subcontracting requirements submitted with his/her Proposal. The failure of the CONSULTANT to comply with this commitment during the Contract's performance period may be considered a breach of Contract.

The County may take action up to and including termination for default if this condition is not remedied within the time period specified by the Manager, Procurement Division.

XIV
ASSIGNABILITY; EMPLOYMENT OF SPECIALISTS

A. The CONSULTANT shall maintain an adequate and competent professional staff and may associate with such staff, professional specialists for the purpose of ensuring and enlarging its services hereunder, without additional cost to the COUNTY. Should the CONSULTANT desire to utilize such specialists, the CONSULTANT is fully responsible for satisfactory completion of all work within the scope of this Contract.

B. The CONSULTANT shall be responsible for the integration of all specialists or outside professional work into the documents and for all payments to such specialists or consultants from the fee heretofore stated. Services rendered by the CONSULTANT in connection with coordination of the services of the aforementioned personnel shall be considered within the scope of the basic Contract and no additional fee will be due the CONSULTANT for such work.

C. All final plans and documents prepared by the CONSULTANT must bear the endorsement of a person in the full employ of the CONSULTANT and be duly registered as a Professional Engineer/Architect in the State of Florida.

D. The CONSULTANT shall not assign any interest in this Contract, and shall not transfer any interest in the same without prior written approval of the COUNTY, provided that claims for the money due or to become due the CONSULTANT from the COUNTY under this Contract may be assigned to a bank, trust company, or other financial institution without such approval. Notice of any such assignment or transfer shall be furnished promptly to the COUNTY.

XV
INDEMNIFICATION FOR TORT ACTIONS/LIMITATION OF LIABILITY

A. The provisions of Florida Statute 768.28 applicable to Orange County, Florida apply in full to this Contract. Any legal actions to recover monetary damages in tort for injury or loss of property, personal injury, or death caused by the negligent

or wrongful act or omission of any employee of the COUNTY acting within the scope of his/her office or employment are subject to the limitations specified in this statute.

B. No officer, employee or agent of the COUNTY acting within the scope of his/her employment or function shall be held personally liable in tort or named as a defendant in any action for any injury or damage suffered as a result of any act, event, or failure to act.

C. The COUNTY shall not be liable in tort for the acts or omissions of an officer, employee, or agent committed while acting outside the course and scope of his/her employment. This exclusion includes actions committed in bad faith or with malicious purpose, or in a manner exhibiting wanton and willful disregard of human rights, safety, or property.

XVI
EQUAL OPPORTUNITY

The County's policies of equal opportunity and non-discrimination are intended to assure equal opportunities to every person, regardless of race, religion, sex, color, age, disability or national origin, in securing or holding employment in a field of work or labor for which the person is qualified, as provided and enforced by Section 17-314 of the Orange County Code and the County's relevant Administrative Regulations. It is also the county policy that person(s) doing business with the County shall recognize and comply with this policy and that the County shall not extend public funds or resources in a manner as would encourage, perpetuate or foster discrimination. As such:

1. The Consultant shall adopt and maintain, or provide evidence to the County that Association has adopted and maintains, a policy of nondiscrimination as defined by Section 17-288, Orange County Code, throughout the term of this Agreement.

2. The Consultant agrees that, on written request, the Consultant shall permit reasonable access to all business records or employment, employment advertisement, applications forms, and other pertinent data and records, by the County, for the purpose of investigating to ascertain compliance with the non-discrimination provisions of this contract; provided, that the Contractor shall not be required to produce for inspection records covering periods of time more than one year prior to the date of this Agreement.

3. The Consultant agrees that, if any obligations of this contract are to be performed by subcontractor(s), the provisions of subparagraphs 1 and 2 of this Section shall be incorporated into and become a part of the subcontract.

XVII
CONTROLLING LAWS

This Contract shall be governed by the laws of the State of Florida. Any and all legal action necessary to enforce the provisions of this Contract will be held in Orange County,

Florida. Venue for any litigation involving this contract shall be the Ninth Circuit Court in and for Orange County, Florida.

XVIII
DISLOCATED WORKERS

CONSULTANT has committed to hire >_____ (_)CareerSource Central Florida participants residing in Orange County, Florida. Therefore, within five (5) days after contract award, CONSULTANT shall contact the Orange County Business Development Liaison at (407) 836-5484 to assist with meeting this requirement.

The BDD Liaison will work with the CareerSource Central Florida staff and the Consultant to ensure that the process is properly adhered until all requirements have been met. Career Force Central Florida participants may be employed in any position within the firm but must be hired on a full-time basis.

The failure of the CONSULTANT to comply with these hiring commitments after contract award shall be grounds for termination of the contract for default.

During performance of the contract, the CONSULTANT will take appropriate steps to ensure that individuals hired under this program are retained. However, if it becomes necessary to replace an employee, the CONSULTANT shall provide verification of the replacement worker's status from the CareerSource Central Florida. At its discretion, COUNTY may periodically request submission of certified payrolls to confirm the employment status of program participants.

XIX
REGISTERED SERVICE-DISABLED VETERAN PARTICIPATION

A. The CONSULTANT shall be responsible for reporting Registered Service-Disable Veteran (SDV) sub-consultant Contract dollar amount(s) for the registered SDV SUBCONSULTANT(s) listed in this document, by submitting the appropriate documents, which shall include but not limited to fully executed sub-contract agreements and/or purchase orders evidencing contract award of work, to the Business Development Division. Submittal of these sub-contract agreements/purchase orders is a condition precedent to execution of the prime contract with the County. Quarterly updated SDV utilization reports and Schedule of Minorities and Women reports are to be submitted every quarter during the term of the contract. Additionally, the Consultant shall ensure that the SDV participation percentage proposed in the Consultant's Proposal submitted for this Contract is accomplished.

B. Subsequent amendments to this contract shall be submitted with the appropriate documentation evidencing contractual change or assignment of work to the Business Development Division, with a copy to the COUNTY'S designated representative, within ten (10) days after COUNTY'S execution.

C. The awarded prime consultant shall furnish written documentation evidencing actual dollars paid to **all sub-consultants** utilized by the prime consultant on the

project. This will include, but not limited to: copies of cancelled checks, approved invoices, and signed affidavits certifying the accuracy of payments so that the County may determine actual SDV participation achieved by the Prime Consultant prior to the issuance of final payment.

D. The awarded prime consultant shall not substitute, replace or terminate any M/WBE firm without prior written authorization from the Business Development Division Manager. In the event a registered SDV sub-CONSULTANT's sub-contract is terminated for cause, the CONSULTANT shall justify the replacement of that sub-CONSULTANT with another registered SDV firm, in writing to the Business Development Division, accompanied by the Project Manager's recommendation or consent to termination.

E. It is the intent of the COUNTY to insure prompt payment of all sub-consultants working on COUNTY projects. The CONSULTANT shall:

1. Submit copies of executed contracts between the CONSULTANT and all of its SDV sub-consultants to the Business Development Division.

2. The County may at its discretion require copies of subcontracts/purchase orders for the non-SDV's listed on Form B and or utilized on the project. However, if this option is <u>not</u> exercised the awarded Proposer shall provide a list of all non-SDV subconsultants certifying that a prompt payment clause has been included in that contract or purchase order.

3. Incorporate a prompt payment assurance provision and payment schedule in all contracts between the CONSULTANT and sub-consultants (including those with non-SDV's) stating that payment will be made to the sub-consultant within 72 hours of receipt of payment from the COUNTY. The CONSULTANT shall pay each sub-consultant for all work covered under an invoice within the 72 hour time frame.

The Proposer shall contract the Business Development Division Liaison at 407-836-8363 for any questions and/or concerns as it relates to Registered Service Disabled Veterans.

F. By entering into this contract, the CONSULTANT affirmatively commits to comply with the SDV subcontracting requirements submitted with his/her Proposal. The failure of the CONSULTANT to comply with this commitment during the Contract's performance period may be considered a breach of Contract. The County may take action up to and including termination for default if this condition is not remedied within the time period specified by the Manager, Procurement Division.

XX
CONTRACT CLAIMS

"Claim" as used in this provision means a written demand or written assertion by one of the contracting parties seeking as a matter of right, the payment of a certain sum of

money, the adjustment or interpretation of contract terms, or other relief arising under or relating to this contract.

Claims made by a Consultant against the County relating to a particular contract shall be submitted to the Procurement Division Manager in writing clearly labeled "Contract Claim" requesting a final decision. The Consultant also shall provide with the claim a certification as follows: "I certify that the claim is made in good faith; that the supporting data are accurate and complete to the best of my knowledge and belief; that the amount requested accurately reflects the contract adjustment for which the Consultant believes the County is liable; and that I am duly authorized to certify the claim on behalf of the Consultant."

Failure to document a claim in this manner shall render the claim null and void. Moreover, no claim shall be accepted after final payment of the contract.

The decision of the Procurement Division Manager shall be issued in writing and shall be furnished to the Consultant. The decision shall state the reasons for the decision reached. The Procurement Division Manager shall render the final decision within sixty (60) days after receipt of Consultant's written request for a final decision. The Procurement Division Manager's decision shall be final and conclusive.

The Consultant shall proceed diligently with performance of this contract pending final resolution of any request for relief, claim, appeal or action arising under the contract and shall comply with any final decision rendered by the Manager of the Procurement Division.

XXI
AVAILABILITY OF FUNDS

The obligations of Orange County under this Contract are subject to availability of funds lawfully appropriated for its purpose by the Board of County Commissioners, or other specified funding source for this contract.

XXII
PROHIBITION AGAINST CONTINGENT FEES

The Consultant warrants that they have not employed or retained any company or person, other than a bona fide employee working solely for the Consultant, to solicit or secure this Contract and that they have not paid or agreed to pay any person, company, corporation, individual or firm other than a bona fide employee working solely for the Consultant any fee, commission, percentage, gift or any other consideration, contingent upon or resulting from the award of this Contract. For the breach or violation of this provision, the County shall have the right to terminate the Contract at its sole discretion, without liability and to deduct from the Contract price, or otherwise recover, the full amount of such fee, commission, percentage, gift or consideration.

XXIII
TOBACCO FREE CAMPUS

All Orange County operations under the Board of County Commissioners shall be tobacco

free. This policy shall apply to parking lots, parks, break areas and worksites. It is also applicable to Consultants and their personnel during contract performance on county-owned property. Tobacco is defined as tobacco products including, but not limited to, cigars, cigarettes, e-cigarettes, pipes, chewing tobacco and snuff. Failure to abide by this policy may result in civil penalties levied under Chapter 386, Florida Statutes and/or contract enforcement remedies.

XXIV
VERIFICATION OF EMPLOYMENT STATUS

Prior to the employment of any person performing services under this contract, the CONSULTANT shall utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of: (a) all employees within the State of Florida that are hired by the CONSULTANT after the execution of the contract who are providing labor under the contract during the contract term; and, (b) all employees within the State of Florida of any of the CONSULTANT'S sub-consultants that are hired by those sub-consultants after the execution of the contract who are providing labor under the contract during the contract term. Please refer to USCIS.gov for more information on this process.

Only those employees determined eligible to work within the United States shall be employed under the contract.

Therefore, by submission of a proposal in response to this solicitation, the CONSULTANT confirms that all employees in the above categories will undergo e-verification before performing labor under this contract. The CONSULTANT further confirms his commitment to comply with the requirement by completing the E-Verification certification, contained in this solicitation.

XXV
ASBESTOS FREE MATERIALS

For contracts for design services, CONSULTANT shall provide a written and notarized statement on company letterhead to certify and warrant that the project was designed with asbestos free materials. Such statement shall be submitted with the final payment request. Final payment shall not be made until such statement is submitted. CONSULTANT agrees that if materials containing asbestos are subsequently discovered at any future time to have been included in the design, CONSULTANT shall be liable for all costs related to the redesign or modification of the construction of the project so that materials containing asbestos are removed from the design, plans or specifications or construction contract documents, and, in addition, if construction has begun or has been completed pursuant to a design that includes asbestos containing materials, the CONSULTANT shall also be liable for all costs related to the abatement of such asbestos.

XXVI
DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION:

By executing this agreement the Bidder affirms that it is in compliance with the requirements of 2 C.F.R. Part 180 and that neither it, its principals, nor its subcontractors are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

XXVII
FLORIDA CONVICTED/SUSPENDED/DISCRIMINATORY COMPLAINTS:

By executing this agreement the Bidder affirms that it is not currently listed in the Florida Department of Management Services Convicted/Suspended/Discriminatory Complaint Vendor List.

XXVIII
SEVERABILITY

The provisions of this Agreement are declared by the parties to be severable. However, the material provisions of this Agreement are dependent upon one another, and such interdependencies a material inducement for the parties to enter into this Agreement. Therefore, should any material term, provision, covenant or condition of this Agreement be held invalid or unenforceable by a court of competent jurisdiction, the party protected or benefited by such term, provision, covenant, or condition may demand that the parties negotiate such reasonable alternate contract language or provisions as may be necessary either to restore the protected or benefited party to its previous position or otherwise mitigate the loss of protection or benefit resulting from holding.

XXIX
PUBLIC RECORDS COMPLIANCE (APPLICABLE FOR SERVICE CONTRACTS)

Orange County is a public agency subject to Chapter 119, Florida Statutes. The Consultant agrees to comply with Florida's Public Records Law. Specifically, the Consultant shall:

1. Keep and maintain public records required by Orange County to perform the service.

2. Upon request from Orange County's custodian of public records, provide Orange County 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 this chapter or as otherwise provided by law.

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

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

5. A Consultant who fails to provide the public records to Orange County within a reasonable time may be subject to penalties under section 119.10, Florida Statutes.

6. **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 :**

400 E. South Street, 2nd Floor, Orlando, FL 32801
407-836-5897
ProcurementRecords@ocfl.net

> BOARD OF COUNTY COMMISSIONERS
> ORANGE COUNTY, FLORIDA

_____ _____

Signature Carrie Mathes, MPA, CFCM, CPPO, C.P.M.
CPPB, A.P.P., Manager, Procurement Division

_____
Title

_____ _____

Name Typed or Printed Date (for County use only)

REQUEST FOR PROPOSALS
#Y20-812-TA
ENGINEERING SERVICES FOR HAMLIN WATER RECLAMATION FACILITY PHASE 2 IMPROVEMENTS
DUE 2:00 P.M. – December 19, 2019

PROPOSER INFORMATION:
NAME OF FIRM: _____

ADDRESS: _____ (Street Address)

_____ (PO Box)

_____ (City, County, State, Zip)

PHONE: _____

FAX: _____

AUTHORIZED SIGNATORY: _____(Print Name) TITLE:_____

SIGNATURE: _____

CONTACT'S E-MAIL ADDRESS:_____

TIN#_____

NOTE: COMPANY NAME MUST MATCH LEGAL NAME ASSIGNED TO TIN NUMBER. CURRENT W9 MUST BE SUBMITTED WITH PROPOSAL.

IDENTIFICATION OF BUSINESS ORGANIZATION:
Check the appropriate box that describes the organization of the firm proposing:

[ ] Sole Proprietorship [ ] Partnership [ ] Joint Venture [ ] Corporation

State of Incorporation: _____

Principal Place of Business (Florida Statute Chapter 607): _____

Check all that apply:

[ ] Mergers [ ] Parent Company [ ] Subsidiary

If a merger, a parent company or subsidiary relationship applies, list **all** entities in the relationships:
_____

The bidder or proposer represents that the following principals are authorized to sign and/or negotiate Contracts and related documents to which the bidder or proposer will be duly bound. Principal is defined as an employee, officer or other technical or professional in a position capable of substantially influencing the development or outcome of an activity required to perform the covered transaction.

Name	Title	Phone Number

FORM A

ADDENDUM ACKNOWLEDGEMENT:

The Proposer shall acknowledge receipt of any addenda issued to the solicitation by completing the blocks below or by completion of the applicable information on the addendum and returning it not later than the date and time for receipt of the Proposal. Failure to acknowledge an addendum that has a material impact on the solicitation may negatively impact the responsiveness of your Proposal. Material impacts include but are not limited to changes to scope of work, delivery time, performance period, quantities, bonds, letters of credit, insurance, qualifications, etc.

Addendum No. _____	Date	Addendum No. _____	Date:
Addendum No. _____	Date:	Addendum No. _____	Date:

PROJECT TEAM

RFP Project Number: _____
TEAM NAME:_____

Federal I. D. Number: _____
Is Prime Consultant: an O.C. certified M/WBE Firm Yes_____ No_____
An O.C. registered SDV Firm Yes_____ No_____
Are you utilizing M/WBE credit for this RFP Yes_____ No_____
If yes, then specify:_____

PRIME **Role**	**Name and City of Residence of Individual Assigned to the Project**	**Number of Years Experience**	**Education, Degree(s)**	**Florida Active Registration Numbers**
Principle-in-Charge				
Project Manager				
Project Architect (or Engineer)				
Project Construction Administrator				
Other Key Member ( )				
Other Key Member ( )				

SUBCONSULTANT **Role**	**Company Name and Address of Office Handling this Project**	**If Certified M/WBE specify which; Or If Registered SDV indicate**	**Projected % of Overall work on the entire project**	**Name of Individual Assigned to the Project**
Architecture				
Mechanical Engineering				
Electrical Engineering				
Structural Engineering				
Civil Engineering				
Landscape Architecture				
Other Key Member ( )				
Other Key Member ( )				
Other Key Member ( )				
Other Key Member ( )				

Note: Percentages indicated must conform to percentages indicated on Form C

FORM B

LOCATION

Proposers shall complete and submit the information below to clearly identify the location and applicable percentage of the work to be performed at each location listed. **Also, proposers shall complete and sign the attached pages, 2 through 4, concerning location. NOTE: THE AFFIDAVIT/NOTARIZATION REQUIREMENT (page 4).**

PRIME CONSULTANT/ CONTRACTOR (Name & Address)	**CITY**	**COUNTY**	**STATE ZIP**	**PERCENTAGE OF WORK ASSIGNED**
1. _____	_____	_____	_____	_____%
_____			_____	
2. _____	_____	_____	_____	_____%
_____			_____	
3. _____	_____	_____	_____	_____%
_____			_____	

SUBCONSULTANT/SUBCONTRACTOR (Name & Address)

1. _____	_____	_____	_____	_____%
_____			_____	
2. _____	_____	_____	_____	_____%
_____			_____	
3. _____	_____	_____	_____	_____%
_____			_____	
4. _____	_____	_____	_____	_____%
_____			_____	
5. _____	_____	_____	_____	_____%
_____			_____	
6. _____	_____	_____	_____	_____%
_____			_____	
7. _____	_____	_____	_____	_____%
_____			_____	

Use additional pages if necessary - Total Percentage must equal 100%

LOCATION (continued)

1. Current domicile of Project Manager.

Name of Project Manager _____

City & County _____

State _____

2. Will Project Manager relocate to an Orange County address to facilitate contract performance? (check appropriate line)

No _____ Not Applicable _____

If Project Manager will not relocate, explain how the Project Manager will manage the project and maintain close communication with the County.

Yes _____ Not Applicable _____

If yes, please explain when relocation will occur in relationship to contract award.

LOCATION (continued)

3. Current domicile of Project Engineer.

Name of Project Engineer _____

City & County _____

State _____

4. Will Project Engineer relocate to an Orange County address to facilitate contract performance? (check appropriate line)

No _____ Not Applicable _____

If Project Engineer will not relocate, explain how the Project Engineer will manage the project and maintain close communication with the County.

Yes _____ Not Applicable _____

If yes, please explain when relocation will occur in relationship to contract award.

LOCATION (continued)

AFFIDAVIT

Under penalties of perjury, I swear affirm that the preceding location information is true and correct. I also acknowledge that any material misrepresentation will be grounds for terminating for default any contract, which may have been awarded due in whole or part to such misrepresentation. I also understand that false statements may result in criminal prosecution for a felony of the third degree per Section 92.525(3), Florida Statutes.

_____ _____

Authorized Signatory **Name of Proposer**

_____ _____

Typed or Printed Full Name **Date**

_____

Title

On this _____ day of _____, 20__, before me appeared (name) _____

_____, to me personally known, who being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (name of firm) _____ to execute the affidavit and did so as his or her free act and deed.

Notary Public _____

Commission Expires _____

(seal)

Date _____

State of _____

County of _____

SIMILAR PROJECTS

PROJECT MANAGER

USING PAGES D1 – D3 only - List up to three SIMILAR PROJECTS, (one project per page), for which services have been SUCCESSFULLY COMPLETED as defined in the similar projects provision, immediately preceding the due date proposals in response to the Request for Proposals, of which most closely match the scope of work in this RFP, as identified in similar project description, wherein the proposed Project Manager has performed IN THE SAME CAPACITY with your firm, or other firms.

LIST THE ONE PROJECT MANAGER ONLY AS INDICATED ON FORM B. Proposers must explain and emphasize how each element of the similar project description was performed in conjunction with the project listed.

The Proposer shall ensure that the basic description of the similar project, including all required performance requirements and/or dimensions are *identified* and that the elements are adequately explained in the text. The description shall document how the particular element was performed in conjunction with the overall project. The mere listing of elements without specific details in the body of the description will negatively impact the scoring for the project.

In addition, the Proposer should provide a narrative of what skills were used that are similar in nature to what is required in the scope of services for this RFP.

Proposed Project Manager: Name: _____

1. Project Name:
   Owner:
   Reference Name, Address Phone Number, Fax Number, Email Address:

   Firm:
   Project Type:
   Check services completed, provide completion date
   □ Preliminary Engineering, Completion Date (month/date/year)_____

   □ Final Design Services, Completion Date (month/date/year)_____

   □ Permitting Services, Completion Date (month/date/year)_____

   □ Construction Administration, Substantial Completion Date (month/date/year)_____

   Design or Consulting Fee:
   Construction Cost:
   Summary of Work:

Proposed Project Manager: Name: _____

2.

Project Name:
Owner:
Reference Name, Address Phone Number, Fax Number, Email Address:

Firm:
Project Type:
Check services completed, provide completion date

□ Preliminary Engineering, Completion Date (month/date/year)_____

□ Final Design Services, Completion Date (month/date/year)_____

□ Permitting Services, Completion Date (month/date/year)_____

□ Construction Administration, Substantial Completion Date (month/date/year)_____

Design or Consulting Fee:
Construction Cost:
Summary of Work:

Proposed Project Manager: Name: _____

3.

Project Name:
Owner:
Reference Name, Address Phone Number, Fax Number, Email Address:

Firm:
Project Type:
Check services completed, provide completion date

□ Preliminary Engineering, Completion Date (month/date/year)_____

□ Final Design Services, Completion Date (month/date/year)_____

□ Permitting Services, Completion Date (month/date/year)_____

□ Construction Administration, Substantial Completion Date (month/date/year)_____

Design or Consulting Fee:
Construction Cost:
Summary of Work:

SIMILAR PROJECTS

PROJECT ENGINEER

USING PAGES E1 – E3 only - List up to three SIMILAR PROJECTS, (one project per page), for which services have been SUCCESSFULLY COMPLETED as defined in the similar projects provision, immediately preceding the due date proposals in response to the Request for Proposals, which most closely match the scope of work in this RFP, as identified in similar project description, wherein the proposed project engineer has performed IN THE SAME CAPACITY with your firm, or other firms.

LIST THE ONE PROJECT ENGINEER ONLY AS INDICATED ON FORM B. Proposers must explain and emphasize how each element of the similar project description was performed in conjunction with the project listed.

The Proposer shall ensure that the basic description of the similar project, including all required performance requirements and/or dimensions are *identified* and that the elements are adequately explained in the text. The description shall document how the particular element was performed in conjunction with the overall project. The mere listing of elements without specific details in the body of the description will negatively impact the scoring for the project.

In addition, the Proposer should provide a narrative of what skills were used that are similar in nature to what is required in the scope of services for this RFP.

Proposed Project Engineer : _____

1.

Project Name:
Owner:
Reference Name, Address Phone Number, Fax Number, Email Address:

Firm:
Project Type:
Check services completed, provide completion date

□ Preliminary Engineering, Completion Date (month/date/year)_____

□ Final Design Services, Completion Date (month/date/year)_____

□ Permitting Services, Completion Date (month/date/year)_____

□ Construction Administration, Substantial Completion Date (month/date/year)_____

Design or Consulting Fee:
Construction Cost:
Summary of Work:

Proposed Project Engineer: _____

2.

Project Name:
Owner:
Reference Name, Address Phone Number, Fax Number, Email Address:

Firm:
Project Type:
Check services completed, provide completion date

□ Preliminary Engineering, Completion Date (month/date/year)_____
□ Final Design Services, Completion Date (month/date/year)_____
□ Permitting Services, Completion Date (month/date/year)_____
□ Construction Administration, Substantial Completion Date (month/date/year)_____

Design or Consulting Fee:
Construction Cost:
Summary of Work:

Proposed Project Engineer: _____

3.

Project Name:
Owner:
Reference Name, Address Phone Number, Fax Number, Email Address:

Firm:
Project Type:
Check services completed, provide completion date

□ Preliminary Engineering, Completion Date (month/date/year)_____
□ Final Design Services, Completion Date (month/date/year)_____
□ Permitting Services, Completion Date (month/date/year)_____
□ Construction Administration, Substantial Completion Date (month/date/year)_____

Design or Consulting Fee:
Construction Cost:
Summary of Work:

FORM F

SKILLS AND EXPERIENCE OF THE PROJECT TEAM

Using a maximum of three pages, 8 1/2" X 11", labeled "Form F-1" through "Form F-3" describe the experience of the entire project team as it relates to this project. Title the first page "Skills and Experience of the Project Team" and label each page as described above. Include the experience of the prime CONSULTANT as well as other members of the project team; i.e., additional personnel, subconsultants, branch offices, team members, and other resources anticipated to be utilized for this project. Name specific projects (successfully completed within the past ten years) where the team members have performed similar projects previously.

Specifically identify the management plan. The management plan shall describe, at a minimum, the Proposer's basic approach to the management of the project, to include reporting hierarchy of staff and subconsultants, clarify the individual(s) responsible for the co-ordination of the separate components of the scope of work, and describe the quality assurance/quality control plan. Provide an organizational chart for the team and label as "Form F-4"; the organizational chart will be in addition to the three page maximum.

PROJECT SCOPE, APPROACH AND UNDERSTANDING

Using a maximum of five pages, 8 1/2" x 11", labeled "Form H-1" through "Form H-5" delineate your firm's understanding of the project, scope and approach or approaches to successful completion, specialized skills available, special considerations and possible difficulties in completing the project as specified. Describe alternate approaches to the project if applicable. Title the first page "Project Scope, Approach and Understanding" and label each page as described above.

CONFLICT/NON-CONFLICT OF INTEREST STATEMENT

CHECK ONE

[ ] To the best of our knowledge, the undersigned firm has no potential conflict of interest due to any other clients, contracts, or property interest for this project.

OR

[ ] The undersigned firm, by attachment to this form, submits information which may be a potential conflict of interest due to other clients, contracts, or property interest for this project.

LITIGATION STATEMENT

CHECK ONE

[ ] The undersigned firm has had no litigation and/or judgments entered against it by any local, state or federal entity and has had no litigation and/or judgments entered against such entities during the past ten (10) years.

[ ] The undersigned firm, **BY ATTACHMENT TO THIS FORM**, submits a summary and disposition of individual cases of litigation and/or judgments entered by or against any local, state or federal entity, by any state or federal court, during the past ten (10) years.

_____
COMPANY NAME

_____
AUTHORIZED SIGNATURE

_____
NAME (PRINT OR TYPE)

_____
TITLE

Failure to check the appropriate blocks above may result in disqualification of your proposal. Likewise, failure to provide documentation of a possible conflict of interest, or a summary of past litigation and/or judgments, may result in disqualification of your proposal.

RFP Number & Title: _____ **Proposer Name:** _____

EQUAL OPPORTUNITY WORKFORCE SCHEDULE

See: Sec. 17-322 (Establishment of goals; employment), Orange County Code of Ordinances

Directions: Review the definition of "minority" in Sec. 17-319 (Definitions), Orange County Code of Ordinances, and record the demographics of your workforce by inserting the number of applicable employees in each box below. The County will only consider your total workforce ("TWF") that falls within the "employee types" designated by an asterisk (*) when evaluating this Bid/Proposal Response. For data collecting purposes, record any applicable employees located in the Orlando Metropolitan Statistical Area ("OMSA") of Lake, Orange, Osceola, and Seminole counties. If a Joint Venture is bidding, each entity must fill out a separate schedule.

WORKFORCE		African American		Asian American		Hispanic American		Native American		Caucasian/Other		TOTAL	
		TWF	OMSA	TWF	OMSA	TWF	OMSA	TWF	OMSA	TWF	OMSA	TWF	OMSA
Employee Types (MALE)	Officials, Managers, and Supervisors*												
	Professionals*												
	Technicians*												
	Sales Workers												
	Office and Clerical												
	Craftsman (Skilled)												
	Operatives (Semi-Skilled)												
	Laborers (Unskilled)												
	Service Workers												
	Apprentice*												
	Interns/Co-Ops*												
	Displaced Workers												
MALE SUBTOTAL													
Employee Types (FEMALE)	Officials, Managers, and Supervisors*												
	Professionals*												
	Technicians*												
	Sales Workers												
	Office and Clerical												
	Craftsman (Skilled)												
	Operatives (Semi-Skilled)												
	Laborers (Unskilled)												
	Service Workers												
	Apprentice*												
	Interns/Co-Ops*												
	Displaced Workers												
FEMALE SUBTOTAL													
TOTAL													

Form Completed by (Print): _____ **Signature:** _____

Form Approved by (Print): _____ **Signature:** _____

FORM J

INFORMATION FOR DETERMINING JOINT VENTURE ELIGIBILITY

If the proposer is submitting as a joint venture, please be advised that this form [3 pages] **MUST** be completed and the **REQUESTED** written joint-venture agreement **MUST** be attached and submitted with this form.

However, if the proposer is not a joint venture, check the following block: ( ) NOT APPLICABLE and proceed to Form L.

1. Name of joint venture: _____

2. Address of joint venture: _____

3. Phone number of joint venture: _____

4. Identify the firms which comprise the joint venture:_____

_____

_____

5. Describe the role of the MBE firm (if applicable) in the joint venture:_____

_____

_____

6. Provide a copy of the formal written and executed joint venture agreement.

7. What is the claimed percentage of ownership and identify any MWBE partners (if applicable)? _____

_____

8. Ownership of joint venture: (This need not be filled in if described in the joint venture agreement provided by question 6.)

   (a) Profit and loss sharing: _____

   (b) Capital contributions, including equipment: _____

   (c) Other applicable ownership interests: _____

9. Control of and participation in this contract. Identify by name, race, sex, and "firm" those individuals (and their titles) who are responsible for day-to-day management and policy decision making, including, but not limited to, those with prime responsibility for:

   (a) Financial decisions:_____

      a. Management decisions, such as:_____

(1) Estimating: _____

_____

(2) Marketing and sales: _____

_____

(3) Hiring and firing of management personnel: _____

_____

(4) Purchasing of major items or supplies: _____

_____

(c) Supervision of field operations: _____

_____

NOTE: If, after filing this form and before the completion of the joint venture's work on the subject contract, there is any significant change in the information submitted, the joint venture must inform the County in writing.

*** Joint venture must be properly registered with the Florida Division of Corporations before the contract award and the name of the Joint Venture must be the same name used in the RFP proposal.**

AFFIDAVIT

"The undersigned swear or affirm that the foregoing statements are correct and include all material information necessary to identify and explain the terms and operation of our joint venture and the intended participation by each joint venturer in the undertaking. Further, the undersigned covenant and agree to provide to the County current, complete and accurate information regarding actual joint venture work and the payment therefore and any proposed changes in any of the joint venture. Also, permit authorized representatives of the County to audit and examine records of the joint venture. Any material misrepresentation will be grounds for terminating any contract which may be awarded and for initiating action under Federal or State laws concerning false statements."

Name of Firm: _____	Name of Firm: _____
Signature: _____	Signature: _____
Name: _____	Name: _____
Title: _____	Title: _____
Date: _____	Date: _____

State of _____

County of _____

AFFIDAVIT

On this _____ day of _____, 20___, before me appeared (name) _____, to me personally known, who being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (name of firm) _____ to execute the affidavit and did so as his or her free act and deed.

Notary Public _____

Commission Expires _____

(Seal)

Date _____

State of _____

County of _____

On this _____ day of _____, 20____, before me appeared _____ (name), to me personally known, who being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (name of firm) _____to execute the affidavit and did so as his or her free act and deed.

Notary Public _____

Commission Expires _____

(Seal)

DRUG-FREE WORKPLACE FORM

The undersigned vendor, in accordance with Florida Statute 287.087, hereby certifies that _____ does:

Name of Proposer

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, 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 Paragraph 1.

4. In the statement specified in Paragraph 1, notify the employees 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 convictions of, or plea of guilty or nolo contendere to, any violation of Chapter 1893 or of any controlled substance law of the United States or any state, for any 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 work-place through implementation of Paragraphs 1 through 5.

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

Proposer's Signature: _____

Date: _____

FORM L

LETTER OF INTENT
(VERIFICATION OF M/WBE UTILIZATION)

INSTRUCTIONS Proposers shall place the following on their letterhead, executed by their authorized agent. Signed Letters of Intent must be submitted with the Proposal for each M/WBE Subconsultant(s) listed by the Proposer on Form B, Project Team. If percentages or dollar values listed on this agreement differ from percentages or dollar values listed on Form B and C of the proposal, the values listed on this Letter of Intent will supercede for RFP scoring/evaluation.

The subcontract will reflect a 72 hour prompt payment clause.

Failure to complete and submit these forms may result in finding of the submittals non-responsive.

_____
M/WBE Subconsultant

_____
Certified Scope(s) of Work

_____
Subcontract Percentage/Amount **(ONLY USED TOWARDS M/WBE UTILIZATION)**

I understand that I shall not be allowed to substitute or change subconsultants without prior written approval of the Business Development Division. Such approval shall in no way relieve my obligations pursuant to Orange County's M/WBE requirements and goals contained in the Orange County Minority/Women Business Enterprise Ordinance, No. 94-02/2009-21, as modified.

Under penalty of perjury, I declare that I have read the foregoing and the facts stated in it are true. False statements may result in criminal prosecution for a felony of the third degree as provided for in Section 92.525(3), Florida Statutes.

I, _____,(M/WBE Sub-Consultant) understand that "It is my responsibility to submit the required quarterly M/WBE utilization reports to the Prime and Final M/WBE payment verification form to Business Development Division."

Failure to submit the required documents could negatively impact my M/WBE certification.

_____ _____
Authorized Agent of Prime Consultant Date

_____
Printed Name & Title

_____ _____
Authorized Agent of M/WBE Subconsultant Date

_____
Printed Name & Title

_____
M/WBE Address

_____

_____
Phone Number/Fax Number

FORM M-1

LETTER OF INTENT
(VERIFICATION OF REGISTERED SERVICE-DISABLED VETERAN UTILIZATION)

INSTRUCTIONS Proposers shall place the following on their letterhead, executed by their authorized agent. Signed Letter must be submitted with the Proposal for each Registered Service-Disabled Veteran Sub-consultant(s) listed by the Proposer of Form B, Project Team. If percentages or dollar values listed on this agreement differ from percentages or dollar values listed on Form B and C of the proposal, the values listed on this Letter of Intent will supersede for RFP scoring/evaluation.

The subcontract will reflect a 72 hour prompt payment cause.

Failure to complete and submit these forms may result in finding of the submittals non-responsive.

_____
SDV Sub-consultant

_____
Registered Scope(s) of Work

_____
Subcontract Percentage/Amount **(ONLY USED TOWARDS BONUS POINTS)**

I understand that I shall not be allowed to substitute or change SubConsultants, without the express prior approval of the Business Development Division. Such approval shall in no way relieve my obligations pursuant to Orange County's Service-Disable Veteran Business Program requirements contained in the Orange County Ordinance, Orange County Code, Chapter 17, Article III, Division 5.

Under penalty of perjury, I declare that I have read the foregoing and the facts stated in it are true. False statements may result in criminal prosecution for a felony of the third degree as provided for in Section 92.525(3), Florida Statutes.

_____ _____
Authorized Agent of Prime Consultant Date

_____
Printed Name & Title

_____ _____
Authorized Agent of SDV Sub-consultant Date

_____
Printed Name & Title

_____
SDV Address

_____
Phone Number

_____Fax Number

FORM M-2

For Staff Use Only:

Specific Project Expenditure Report (Revised November 5, 2010) Initially submitted on_____

For use as of March 1, 2011 Updated On _____

Engineering Services for Hamlin Water Reclamation Facility Phase 2 Improvements

Case or Bid No. **Y20-812-TA**

ORANGE COUNTY SPECIFIC PROJECT EXPENDITURE REPORT

This lobbying expenditure form shall be completed in full and filed with all application submittals. This form shall remain cumulative and shall be filed with the department processing your application. Forms signed by a principal's authorized agent shall include an executed Agent Authorization Form.

This is the initial Form: _____
This is a Subsequent Form: _____

Part I
Please complete all of the following:

Name and Address of Principal (legal name of entity or owner per Orange County tax rolls): _____
_____

Name and Address of Principal's Authorized Agent, if applicable: _____

_____

List the name and address of all lobbyists, consultants, contractors, subcontractors, individuals or business entities who will assist with obtaining approval for this project. (Additional forms may be used as necessary.)

1. Name and address of individual or business entity:_____
   Are they registered Lobbyist? Yes __ or No___
2. Name and address of individual or business entity:_____
   Are they registered Lobbyist? Yes __ or No___
3. Name and address of individual or business entity:_____
   Are they registered Lobbyist? Yes __ or No___
4. Name and address of individual or business entity:_____
   Are they registered Lobbyist? Yes __ or No___
5. Name and address of individual or business entity:_____
   Are they registered Lobbyist? Yes __ or No___
6. Name and address of individual or business entity:_____
   Are they registered Lobbyist? Yes __ or No___
7. Name and address of individual or business entity:_____
   Are they registered Lobbyist? Yes __ or No___
8. Name and address of individual or business entity:_____
   Are they registered Lobbyist? Yes __ or No___

For Staff Use Only:

Specific Project Expenditure Report (Revised November 5, 2010) Initially submitted on_____

For use as of March 1, 2011 Updated On _____

Engineering Services for Hamlin Water Reclamation Facility Phase 2 Improvements

Case or Bid No. **Y20-812-TA**

Company Name: _____

Part II
Expenditures:

For this report, an "expenditure" means money or anything of value given by the principal and/or his/her lobbyist for the purpose of lobbying, as defined in section 2-351, Orange County Code. This may include public relations expenditures including, but not limited to, petitions, fliers, purchase of media time, cost of print and distribution of publications. However, the term "expenditure" **does not** include:

- Contributions or expenditures reported pursuant to chapter 106, Florida Statutes;
- Federal election law, campaign-related personal services provided without compensation by individuals volunteering their time;
- Any other contribution or expenditure made by or to a political party;
- Any other contribution or expenditure made by an organization that is exempt from taxation under 26 U.S.C. s. 527 or s. 501(c)(4), in accordance with s.112.3215, Florida Statutes; and/or
- Professional fees paid to registered lobbyists associated with the project or item.

The following is a complete list of all lobbying expenditures and activities (including those of lobbyists, contractors, consultants, etc.) incurred by the principal or his/her authorized agent and expended in connection with the above-referenced project or issue. **You need not include de minimus costs (under $50) for producing or reproducing graphics, aerial photographs, photocopies, surveys, studies or other documents related to this project.**

Date of Expenditure	**Name of Party Incurring Expenditure**	**Description of Activity**	**Amount Paid**
		TOTAL EXPENDED THIS REPORT	$

For Staff Use Only:

Specific Project Expenditure Report (Revised November 5, 2010) Initially submitted on_____

For use as of March 1, 2011 Updated On _____

Engineering Services for Hamlin Water Reclamation Facility Phase 2 Improvements

Case or Bid No. **Y20-812-TA**

Company Name: _____

Part III
ORIGINAL SIGNATURE AND NOTARIZATION REQUIRED

I hereby certify that information provided in this specific project expenditure report is true and correct based on my knowledge and belief. I acknowledge and agree to comply with the requirement of section 2-354, of the Orange County code, to amend this specific project expenditure report for any additional expenditure(s) incurred relating to this project prior to the scheduled Board of County Commissioner meeting. I further acknowledge and agree that failure to comply with these requirements to file the specific expenditure report and all associated amendments may result in the delay of approval by the Board of County Commissioners for my project or item, any associated costs for which I shall be held responsible. In accordance with s. 837.06, Florida Statutes, I understand and acknowledge that whoever knowingly makes a false statement in writing with the intent to mislead a public servant in the performance of his or her official duty shall be guilty of a misdemeanor in the second degree, punishable as provided in s. 775.082 or s. 775.083, Florida Statutes.

Date:_____ _____

Signature of ⌂ Principal or ⌂ Principal's Authorized Agent

(check appropriate box)

PRINT NAME AND TITLE: _____

STATE OF _____ :
COUNTY OF_____ :

I certify that the foregoing instrument was acknowledged before me this _____ day of _____, 20___ by _____. He/she is personally known to me or has produced _____ as identification and did/did not take an oath.

Witness my hand and official seal in the county and state stated above on the _____ day of _____, in the year _____.

_____
Signature of Notary Public

(Notary Seal) Notary Public for the State of _____

My Commission Expires: _____

Staff signature and date of receipt of form _____

Staff reviews as to form and does not attest to the accuracy or veracity of the information provided herein.

FREQUENTLY ASKED QUESTIONS (FAQ) ABOUT THE SPECIFIC PROJECT EXPENDITURE REPORT

Updated 3-1-11

WHAT IS A SPECIFIC PROJECT EXPENDITURE REPORT (SPR)?

A Specific Project Expenditure Report (SPR) is a report required under Section 2-354(b) of the Orange County Lobbying Ordinance, codified at Article X of Chapter 2 of the Orange County Code, reflecting all lobbying expenditures incurred by a principal and his/her authorized agent(s) and the principal's lobbyist(s), contractor(s), subcontractor(s), and consultant(s), if applicable, for certain projects or issues that will ultimately be decided by the Board of County Commissioners (BCC).

Matters specifically exempt from the SPR requirement are ministerial items, resolutions, agreements in settlement of litigation matters in which the County is a party, ordinances initiated by County staff, and some procurement items, as more fully described in 2.20 of the Administrative Regulations.

Professional fees paid by the principal to his/her lobbyist for the purpose of lobbying need not be disclosed on this form. (See Section 2-354(b), Orange County Code.)

WHO NEEDS TO FILE THE SPR?

The principal or his/her authorized agent needs to complete and sign the SPR and warrant that the information provided on the SPR is true and correct.

A principal that is a governmental entity does not need to file an SPR.

HOW ARE THE KEY RELEVANT TERMS DEFINED?

Expenditure means "a payment, distribution, loan, advance, reimbursement, deposit, or anything of value made by a lobbyist or principal for the purpose of lobbying. This may include public relations expenditures (including but not limited to petitions, flyers, purchase of media time, cost of print and distribution of publications) but does not include contributions or expenditures reported pursuant to Chapter 106, Florida Statutes, or federal election law, campaign-related personal services provided without compensation by individuals volunteering their time, any other contribution or expenditure made by or to a political party, or any other contribution or expenditure made by an organization that is exempt from taxation under 26 U.S.C. s. 527 or s. 501(c)(4)." (See Section 112.3215, Florida Statutes.) Professional fees paid by the principal to his/her lobbyist for the purpose of lobbying are not deemed to be "expenditures." (See Section 2-354, Orange County Code.)

Lobbying means seeking "to encourage the approval, disapproval, adoption, repeal, rescission, passage, defeat or modification of any ordinance, resolution, agreement, development permit, other type of permit, franchise, vendor, consultant, contractor, recommendation, decision or other foreseeable action of the [BCC]," and "include[s] all communications, regardless of whether initiated by the lobbyist or by the person being lobbied, and regardless of whether oral, written or electronic." (See Section 2-351, Orange County Code.) Furthermore, *lobbying* means communicating "directly with the

County Mayor, with any other member of the [BCC], or with any member of a procurement committee." (See Section 2-351, Orange County Code.) *Lobbying* also means communicating "indirectly with the County Mayor or any other member of the [BCC]" by communicating with any staff member of the Mayor or any member of the BCC, the county administrator, any deputy or assistant county administrator, the county attorney, any county department director, or any county division manager. (See Section 2-351, Orange County Code.) *Lobbying* does not include the act of appearing before a Sunshine Committee, such as the Development Review Committee or the Roadway Agreement Committee other than the BCC.

Principal means "the person, partnership, joint venture, trust, association, corporation, governmental entity or other entity which has contracted for, employed, retained, or otherwise engaged the services of a lobbyist." *Principal* may also include a person, partnership, joint venture, trust, association, corporation, limited liability corporation, or other entity where it or its employees do not qualify as a lobbyist under the definition set forth in Section 2-351 of the Orange County Code but do perform lobbying activities on behalf of a business in which it has a personal interest.

DOES THE SPR NEED TO BE UPDATED IF INFORMATION CHANGES?
Yes. It remains a continuing obligation of the principal or his/her authorized agent to update the SPR whenever any of the information provided on the initial form changes.

WHERE DO THE SPR AND ANY UPDATES NEED TO BE FILED?
The SPR needs to be filed with the County Department or County Division processing the application or matter. If and when an additional expenditure is incurred subsequent to the initial filing of the SPR, an amended SPR needs to be filed with the County Department or County Division where the original application, including the initial SPR, was filed.

WHEN DO THE SPR AND ANY UPDATES NEED TO BE FILED?
In most cases, the initial SPR needs to be filed with the other application forms. The SPR and any update must be filed with the appropriate County Department or County Division not less than seven (7) days prior to the BCC hearing date so that they may be incorporated into the BCC agenda packet. (See Section 2-354(b), Orange County Code.) When the matter is a discussion agenda item or is the subject of a public hearing, and any additional expenditure occurs less than 7 days prior to BCC meeting date or updated information is not included in the BCC agenda packet, the principal or his/her authorized agent is obligated to verbally present the updated information to the BCC when the agenda item is heard or the public hearing is held. When the matter is a consent agenda item and an update has not been made at least 7 days prior to the BCC meeting or the update is not included in the BCC agenda packet, the item will be pulled from the consent agenda to be considered at a future meeting.

WHO WILL BE MADE AWARE OF THE INFORMATION DISCLOSED ON THE SPR AND ANY UPDATES?

The information disclosed on the SPR and any updates will be a public record as defined by Chapter 119, Florida Statutes, and therefore may be inspected by any interested person. Also, the information will be made available to the Mayor and the BCC members. This information will accompany the other information for the principal's project or item.

CONCLUSION:

We hope you find this FAQ useful to your understanding of the SPR. Please be informed that in the event of a conflict or inconsistency between this FAQ and the requirements of the applicable ordinance governing specific project expenditure reports, the ordinance controls.

Also, please be informed that the County Attorney's Office is not permitted to render legal advice to a principal, his/her authorized agent, or any other outside party. Accordingly, if after reading this FAQ the principal, his/her authorized agent or an outside party has any questions, he/she is encouraged to contact his/her own legal counsel.

OC CE FORM 2P
FOR PROCUREMENT-RELATED ITEMS (November 5, 2010)
For use after March 1, 2011

For Staff Use Only:
Date Submitted _____
Date Updated _____
Bid Number **Y20-812-TA**

RELATIONSHIP DISCLOSURE FORM
FOR USE WITH PROCUREMENT ITEMS, EXCEPT THOSE WHERE THE COUNTY IS THE PRINCIPAL OR PRIMARY APPLICANT

For procurement items that will come before the Board of County Commissioners for final approval, this form shall be completed by the bidder, offerer, quoter or respondent and shall be submitted to the Procurement Division by the bidder, offerer, quoter or respondent.

In the event any information provided on this form should change, the applicant must file an amended form on or before the date the item is considered by the appropriate board or body.

Part I

INFORMATION ON APPLICANT (BIDDER, OFFEROR, QUOTER, PROPOSER, OR RESPONDENT):

Legal Name of Applicant: _____

Business Address (Street/P.O. Box, City and Zip Code): _____

_____

Business Phone ( )_____

Facsimile ( )_____

INFORMATION ON APPLICANT'S AUTHORIZED AGENT, IF APPLICABLE: (Agent Authorization Form also required to be attached)

Name of Applicant's Authorized Agent:
_____

Business Address (Street/P.O. Box, City and Zip Code): _____

_____

Business Phone ( )_____

Facsimile ( )_____

OC CE FORM 2P
FOR PROCUREMENT-RELATED ITEMS (November 5, 2010)
For use after March 1, 2011

For Staff Use Only:
Date Submitted _____
Date Updated _____
Bid Number **Y20-812-TA**

Company Name: _____

Part II

IS THE APPLICANT A RELATIVE OF THE MAYOR OR ANY MEMBER OF THE BCC?

____ YES ____ NO

IS THE MAYOR OR ANY MEMBER OF THE BCC THE APPLICANT'S EMPLOYEE?

____ YES ____ NO

IS THE APPLICANT OR ANY PERSON WITH A DIRECT BENEFICIAL INTEREST IN THE OUTCOME OF THIS MATTER A BUSINESS ASSOCIATE OF THE MAYOR OR ANY MEMBER OF THE BCC?

____ YES ____ NO

If you responded "YES**"** to any of the above questions, please state with whom and explain the relationship:

_____

_____

_____

(Use additional sheets of paper if necessary)

For Staff Use Only:
Date Submitted _____
Date Updated _____
Bid Number **Y20-812-TA**

Company Name:_____

Part III
ORIGINAL SIGNATURE AND NOTARIZATION REQUIRED

I hereby certify that information provided in this relationship disclosure form is true and correct based on my knowledge and belief. If any of this information changes, I further acknowledge and agree to amend this relationship disclosure form prior to any meeting at which the above-referenced project is scheduled to be heard. In accordance with s. 837.06, Florida Statutes, I understand and acknowledge that whoever knowingly makes a false statement in writing with the intent to mislead a public servant in the performance of his or her official duty shall be guilty of a misdemeanor in the second degree, punishable as provided in s. 775.082 or s. 775.083, Florida Statutes.

_____ Date: _____
Signature of Applicant

Print Name and Title of Person completing this form: _____

STATE OF _____ :
COUNTY OF_____ :

I certify that the foregoing instrument was acknowledged before me this _____ day of _____, 20___ by _____. He/she is personally known to me or has produced _____ as identification and did/did not take an oath.

Witness my hand and official seal in the county and state stated above on the _____ day of _____, in the year _____.

_____
Signature of Notary Public
Notary Public for the State of _____
My Commission Expires:
_____

(Notary Seal)

Staff signature and date of receipt of form

_____
Staff reviews as to form and does not attest to the accuracy or veracity of the information provided herein.

AGENT AUTHORIZATION FORM

FOR PROCUREMENTS IN ORANGE COUNTY, FLORIDA

I/WE, (PRINT PROPOSER NAME) _____, DO HEREBY AUTHORIZE TO ACT AS MY/OUR AGENT (PRINT AGENT'S NAME), _____, TO EXECUTE ANY PETITIONS OR OTHER DOCUMENTS NECESSARY TO AFFECT THE CONTRACT APPROVAL PROCESS MORE SPECIFICALLY DESCRIBED AS FOLLOWS, RFP NO. Y20-812-TA, ENGINEERING SERVICES FOR HAMLIN WATER RECLAMATION FACILITY PHASE 2 IMPROVEMENTS, AND TO APPEAR ON MY/OUR BEHALF BEFORE ANY ADMINISTRATIVE OR LEGISLATIVE BODY IN THE COUNTY CONSIDERING THIS CONTRACT AND TO ACT IN ALL RESPECTS AS OUR AGENT IN MATTERS PERTAINING TO THIS CONTRACT.

Date:_____ _____
Signature of Proposer

STATE OF _____ :
COUNTY OF_____ :

I certify that the foregoing instrument was acknowledged before me this _____ day of _____, 20___ by _____. He/she is personally known to me or has produced _____ as identification and did/did not take an oath.

Witness my hand and official seal in the county and state stated above on the _____ day of _____, in the year _____.

_____
Signature of Notary Public

(Notary Seal)

Notary Public for the State of _____

My Commission Expires: _____

FREQUENTLY ASKED QUESTIONS (FAQ)
ABOUT THE
RELATIONSHIP DISCLOSURE FORM
Updated 6-28-11

WHAT IS THE RELATIONSHIP DISCLOSURE FORM?
The Relationship Disclosure Form (form OC CE 2D and form OC CE 2P) is a form created pursuant to the County's Local Code of Ethics, codified at Article XIII of Chapter 2 of the Orange County Code, to ensure that all development-related items and procurement items presented to or filed with the County include information as to the relationship, if any, between the applicant and the County Mayor or any member of the Board of County Commissioners (BCC). The form will be a part of the backup information for the applicant's item.

WHY ARE THERE TWO RELATIONSHIP DISCLOSURE FORMS?
Form OC CE 2D is used only for development-related items, and form OC CE 2P is used only for procurement-related items. The applicant needs to complete and file the form that is applicable to his/her case.

WHO NEEDS TO FILE THE RELATIONSHIP DISCLOSURE FORM?
Form OC CE 2D should be completed and filed by the owner of record, contract purchaser, or authorized agent. Form OC CE 2P should be completed and filed by the bidder, offeror, quoter, or respondent, and, if applicable, their authorized agent. In all cases, the person completing the form must sign the form and warrant that the information provided on the form is true and correct.

WHAT INFORMATION NEEDS TO BE DISCLOSED ON THE RELATIONSHIP DISCLOSURE FORM?
The relationship disclosure form needs to disclose pertinent background information about the applicant and the relationship, if any, between, on the one hand, the applicant and, if applicable, any person involved with the item, and on the other hand, the Mayor or any member of the BCC.

In particular, the applicant needs to disclose whether any of the following relationships exist: (1) the applicant is a business associate of the Mayor or any member of the BCC; (2) any person involved with the approval of the item has a beneficial interest in the outcome of the matter *and* is a business associate of the Mayor or any member of the BCC; (3) the applicant is a relative of the Mayor or any member of the BCC; or (4) the Mayor or any member of the BCC is an employee of the applicant. (See Section 2-454, Orange County Code.)

HOW ARE THE KEY RELEVANT TERMS DEFINED?
Applicant means, for purposes of a development-related project, the owner, and, if applicable, the contract purchaser or owner's authorized agent. *Applicant* means, for purposes of a procurement item, the bidder, offeror, quoter, respondent, and, if applicable, the authorized agent of the bidder, offeror, quoter, or respondent.

Business associate means any person or entity engaged in or carrying on a business enterprise with a public officer, public employee, or candidate as a partner, joint venture, corporate shareholder where the shares of such corporation are not listed on any national or regional stock exchange, or co-owner of property. In addition, the term includes any person or entity engaged in or carrying on a business enterprise, or otherwise engaging in common investment, with a public officer, public employee, or candidate as a partner, member, shareholder, owner, co-owner, joint venture partner, or other investor, whether directly or indirectly, whether through a Business Entity or through interlocking Parent Entities, Subsidiary Entities, or other business or investment scheme, structure, or venture of any nature. (See Section 112.312(4), Florida Statutes, and Section 2-452(b), Orange County Code.)

Employee means any person who receives remuneration from an employer for the performance of any work or service while engaged in any employment under any appointment or contract for hire or apprenticeship, express or implied, oral or written, whether lawfully or unlawfully employed, and includes, but is not limited to, aliens and minors. (See Section 440.02(15), Florida Statutes.)

Relative means an individual who is related to a public officer or employee as father, mother, son, daughter, brother, sister, uncle, aunt, first cousin, nephew, niece, husband, wife, father-in-law, mother-in-law, son-in-law, daughter-in-law, brother-in-law, sister-in-law, stepfather, stepmother, stepson, stepdaughter, stepbrother, stepsister, half brother, half sister, grandparent, great grandparent, grandchild, great grandchild, step grandparent, step great grandparent, step grandchild, step great grandchild, person who is engaged to be married to the public officer or employee or who otherwise holds himself or herself out as or is generally known as the person whom the public officer or employee intends to marry or with whom the public officer or employee intends to form a household, or any other natural person having the same legal residence as the public officer or employee. (See Section 112.312(21), Florida Statutes.)

DOES THE RELATIONSHIP DISCLOSURE FORM NEED TO BE UPDATED IF INFORMATION CHANGES?
Yes. It remains a continuing obligation of the applicant to update this form whenever any of the information provided on the initial form changes.

WHERE DO THE RELATIONSHIP DISCLOSURE FORM AND ANY SUBSEQUENT UPDATES NEED TO BE FILED?
For a development-related item, the Relationship Disclosure Form and any update need to be filed with the County Department or County Division where the applicant filed the application. For a procurement item, the Relationship Disclosure Form and any update need to be filed with the Procurement Division.

WHEN DO THE RELATIONSHIP DISCLOSURE FORM AND ANY UPDATES NEED TO BE FILED?
In most cases, the initial form needs to be filed when the applicant files the initial development-related project application or initial procurement-related forms. However, with respect to a procurement item, a response to a bid will not be deemed unresponsive if this form is not included in the initial packet submitted to the Procurement Division.

If changes are made after the initial filing, the final, cumulative Relationship Disclosure Form needs to be filed with the appropriate County Department or County Division processing the application not less than seven (7) days prior to the scheduled BCC agenda date so that it may be incorporated into the BCC agenda packet. When the matter is a discussion agenda item or is the subject of a public hearing, and an update has not been made at least 7 days prior to BCC meeting date or is not included in the BCC agenda packet, the applicant is obligated to verbally present such update to the BCC when the agenda item is heard or the public hearing is held. When the matter is a consent agenda item and an update has not been made at least 7 days prior to the BCC meeting or the update is not included in the BCC agenda packet, the item will be pulled from the consent agenda to be considered at a future meeting.

WHO WILL REVIEW THE INFORMATION DISCLOSED ON THE RELATIONSHIP DISCLOSURE FORM AND ANY UPDATES?
The information disclosed on this form and any updates will be a public record as defined by Chapter 119, Florida Statutes, and may therefore be inspected by any interested person. Also, the information will be made available to the Mayor and the BCC members. This form and any updates will accompany the information for the applicant's project or item.

FORM O
FAQS

However, for development-related items, if an applicant discloses the existence of one or more of the relationships described above and the matter would normally receive final consideration by the Concurrency Review Committee or the Development Review Committee, the matter will be directed to the BCC for final consideration and action following committee review.

CONCLUSION:
We hope you find this FAQ useful to your understanding of the Relationship Disclosure Form. Please be informed that if the event of a conflict or inconsistency between this FAQ and the requirements of the applicable ordinance or law governing relationship disclosures, the ordinance or law controls.

Also, please be informed that the County Attorney's Office is not permitted to render legal advice to an applicant or any other outside party. Accordingly, if the applicant or an outside party has any questions after reading this FAQ, he/she is encouraged to contact his/her own legal counsel.

E VERIFICATION CERTIFICATION

Contract Y20-812-TA

NAME OF CONSULTANT: _____ (referred to herein as "Consultant")

ADDRESS OF CONSULTANT: _____

The undersigned does hereby certify that the above named consultant:

1. Is registered and is using the E-Verify system; or
2. Does not have any employees and does not intend to hire any new employees during the period of time that the consultant will be providing services under the contract and consequently is unable to register to use the E-Verify system; or
3. Employs individuals that were hired prior to the commencement of providing labor on the contract and does not intend to hire any new employees during the period of time that the Consultant will be providing labor under the contract, and consequently is unable to use the E-Verify system.

The undersigned acknowledges the use of the E-Verify system for newly hired employees is an ongoing obligation for so long as the Consultant provides labor under the contract and that the workforce eligibility of all newly hired employees will be properly verified using the E-Verify system.

In accordance with Section 837.06, Florida Statutes, Consultant acknowledges that whoever knowingly makes a false statement in writing with the intent to mislead a public servant in the performance of his or her official duties shall be guilty of a misdemeanor in the second degree, punishable as provided in Section 775.082 or Section 775.083, Florida Statutes.

AUTHORIZED SIGNATURE: _____

NAME: _____

TITLE: _____

DATE: _____

DISLOCATED WORKERS

PROPOSED HIRING INFORMATION

Section I: To be Submitted with Proposal

Firm: _____

Address: _____

Phone Number: _____

Email Address: _____

Number of Individuals to be Hired: _____

Signature of Authorized Representative of Above Firm: _____

Printed Name: _____

Section II: For CareerSource Central Florida Use Only (To be Completed After Contract Award)

Verification: I certify that the above individuals are dislocated workers

Individual Complete Name:

1. _____ 2. _____

3. _____ 4. _____

*5. _____ *6. _____

CareerSource Central Florida
390 North Orange Avenue, Suite 700
Orlando, FL 32805
407-531-1222
Signature: _____

Printed Name: _____

Date: _____

*CareerSource Participants who do not meet specific job qualifications

SAMPLE DO NOT USE

LEASED EMPLOYEE AFFIDAVIT
CONTRACT #Y_____

I affirm that an employee leasing company provides my workers' compensation coverage. I further understand that my contract with the employee leasing company limits my workers' compensation coverage to enrolled worksite employees only. My leasing arrangement does not cover un-enrolled worksite employees, independent contractors/consultants, uninsured sub-contractors/consultants or casual labor exposure.

I hereby certify that 100% of my workers are covered as worksite employees with the employee leasing company. I certify that I do not hire any casual or uninsured labor outside the employee leasing arrangement. I agree to notify the County in the event that I have any workers not covered by the employee leasing workers' compensation policy. In the event that I have any workers not subject to the employee leasing arrangement, I agree to obtain a separate workers' compensation policy to cover these workers. I further agree to provide the County with a certificate of insurance providing proof of workers' compensation coverage prior to these workers entering any County jobsite.

I further agree to notify the County if my employee leasing arrangement terminates with the employee leasing company and I understand that I am required to furnish proof of replacement workers' compensation coverage prior to the termination of the employee leasing arrangement.

I certify that I have workers' compensation coverage for all of my workers through the employee leasing arrangement specified below:

Name of Employee Leasing Company: _____

Workers' Compensation Carrier: _____

A.M. Best Rating of Carrier: _____

Inception Date of Leasing Arrangement: _____

I further agree to notify the County in the event that I switch employee-leasing companies. I recognize that I have an obligation to supply an updated workers' compensation certificate to the County that documents the change of carrier.

Name of Contractor/Consultant: _____

Signature of Owner/Officer: _____

Title: _____ Date: _____

SAMPLE DO NOT USE

POLICY NUMBER: COMMERCIAL GENERAL LIABILITY
CG 20 10 04 13

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED – DESIGNATED PERSON OR ORGANIZATION

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s):
Orange County Board of County Commissioners Procurement Division 400 E. South Street Orlando, FL 32801
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.

A. Section II – Who is An Insured is amended to include as an additional insured the person(s) or organizations(s) shown in the Schedule, but only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused, in whole or in part, by: **1.** In performance of your ongoing operations; or **2.** In connection with your premises owned by or rented to you. However: 1. The insurance afforded to such additional insured only applies to the extent permitted by law; and 2. If coverage provided to the additional insured is required by a contract or agreement, the insurance afforded to such additional insured will not be broader than that which you are required by the contract or agreement to provide for such additional insured.	**B.** With respect to the insurance afforded to these additional insureds, the following is added to Section III-Limits of Insurance: If coverage provided to the additional insured is required by a contract or agreement, the most we will pay on behalf of the additional insured is the amount of insurance: 1. Required by the contract or agreement; or 2. Available under the applicable Limits of Insurance shown in the Declarations; whichever is less. This endorsement shall not increase the applicable Limits of Insurance shown in the Declarations.

SAMPLE DO NOT USE

POLICY NUMBER: _____ **COMMERCIAL GENERAL LIABILITY**
CG 24 04 0509

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY

WAIVER OF TRANSFER OF RIGHTS OF RECOVERY AGAINST OTHERS TO US

This endorsement modifies Insurance provided under the following:

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

SCHEDULE

Name of Person or Organization:
ORANGE COUNTY BOARD OF COUNTY COMMISSIONERS PROCUREMENT DIVISION 400 E. SOUTH STREET ORLANDO, FL 32801
(Information required to complete this Schedule, if not shown above, will be shown in the Declarations.)

The following is added to Paragraph 8, Transfer of rights of Recovery Against Others To Us of Section IV – Conditions:

We waive any right to recovery we may have against the person or organization shown in the Schedule above because of payments we make for injury or damage arising out of your ongoing operations or "your work" done under a contract with that person or organization and included in the "Products-completed operations hazard". This waiver applies only to the person or organization shown in the Schedule above.

SAMPLE DO NOT USE

WORKERS COMPENSATION AND EMPLOYERS LIABILITY INSURANCE POLICY WC 00 03 13 (Ed. 4-84)

WAIVER OF OUR RIGHT TO RECOVER FROM OTHERS ENDORSEMENT

We have the right to recover our payments from anyone liable for an injury covered by this policy. We will not enforce our right against the person or organization named in the Schedule. (This agreement applies only to the extent that you perform work under a written contract that requires you to obtain this agreement from us.)

This agreement shall not operate directly or indirectly to benefit anyone not named in the Schedule.

Schedule

Name of Person or Organization:

ORANGE COUNTY BOARD OF COUNTY COMMISSIONERS
PROCUREMENT DIVISION
400 E. SOUTH STREET
ORLANDO, FL 32801

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

Endorsement No. Effective Policy No. Endorsement

Insured

Insurance Company Countersigned
by_____

WC 00 03 13