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**INVITATION FOR BIDS**

**FOR**

**ORANGE COUNTY EASTERN WATER RECLAMATION FACILITY  
PHASE I/II AUTOMATIC BACKWASH FILTER REHABILITATION**

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**PART H  
TECHNICAL SPECIFICATIONS**

July 2015  
**BID SET**

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**PART H**

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ORANGE COUNTY  
EASTERN WATER RECLAMATION FACILITY  
PHASE I/II AUTOMATIC BACKWASH FILTER REHABILITATION**

**Cap Number: 1538-04  
Project Sequence Number: 57045  
CPH Project No. O28503**

**July, 2015**

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**SECTION 01001**  
**GENERAL WORK REQUIREMENTS**

**PART 1 - GENERAL**

1.01 NOTICES

- A. All notices or other papers required to be delivered by the Contractor to the County shall be delivered to the office of the Engineering Division, Orange County Utilities Department, 9150 Curry Ford Road, Orlando, FL 32825.

1.02 WORK TO BE DONE

- A. The Contractor shall furnish all labor, materials, equipment, tools, services, and incidentals to complete all work required by these specifications and as shown on the Drawings, at a rate of progress which will ensure completion of the Work within the Contract Time stipulated.
- B. The Contractor shall perform the Work complete, in place, and ready for continuous service, and shall include repairs, testing, permits, clean up, replacements, and restoration required as a result of damages caused during this construction.
- C. The Contractor shall comply with all City, County, State, Federal, and other codes, which are applicable to the proposed Work.
- D. All newly constructed Work shall be carefully protected from injury in any way. No wheeling, walking, or placing of heavy loads on it shall be allowed and all portions damaged shall be reconstructed by the Contractor at his own expense.
- E. Scope of Work: See Section 01010 "Summary of Work" and the Bid Schedule for details.

1.03 DRAWINGS AND PROJECT MANUAL

- A. The Work shall be performed in accordance with the Drawings and Specifications prepared by the County/Professional. All work and materials shall conform to the Orange County Utilities Standards and Construction Specifications Manual, latest edition or as indicated in these Specifications or Drawings.
- B. The Contractor shall verify all dimensions, quantities and details shown on the Drawings, Supplementary Drawings, Schedules, Specifications or other data received from the County/Professional, and shall notify same, in writing, of all errors, omissions, conflicts and discrepancies found therein. Failure to discover or correct errors, conflicts or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory Work, faulty construction or improper operation resulting there from, nor from rectifying such conditions at his own expense.

C. All schedules are given for the convenience of the County and the Contractor and are not guaranteed to be complete. The Contractor shall assume all responsibility for the making of estimates of the size, kind, and quantity of materials and equipment included in the Work to be done under this Contract.

D. Intent:

1. All Work called for in the Specifications applicable to this Contract, but not shown on the Drawings in their present form, or vice versa, shall be of like effect as if shown or mentioned in both. Work not specified either in the Drawings or in the Specifications, but involved in carrying out their intent or in the complete and proper execution of the Work, is required and shall be performed by the Contractor as though it were specifically delineated or described.
2. Items of material, equipment, machinery, and the like may be specified on the Drawings and not in the Specifications. Such items shall be provided by the Contractor in accordance with the specification on the Drawings.
3. The apparent silence of the Specifications as to any detail, or the apparent omission from them of a detailed description concerning any Work to be done and materials to be furnished, shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the best quality is to be used, and interpretation of these Specifications shall be made upon that basis.

E. Refer to the Contract for the order of precedence of items and documents.

#### 1.04 PROTECTION AND RESTORATION

- A. The Contractor shall be responsible for the preservation of all public and private property, and shall use every means of protection necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the Work on the part of the Contractor, such property shall be restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done, or the Contractor shall make good the damage in other manner acceptable to the County/Professional.
- B. Lawn Areas: All lawn areas disturbed by construction shall be replaced with like kind to a condition similar or equal to that existing before construction. Where sod is to be removed, it shall be carefully removed, and the same re-sodded, or the area where sod has been removed shall be restored with new sod in the manner described in the applicable section.
- C. The cost of all labor, materials, equipment, and work for restoration shall be deemed included in the appropriate Contract Item or items, or if no specific item is provided therefore, as part of the overhead cost of the Work, and no additional payment will be made therefore.

#### 1.05 PUBLIC NUISANCE

- A. The Contractor shall not create a public nuisance including, but not limited to,

encroachment on adjacent lands, flooding of adjacent lands, or excessive noise.

- B. Sound levels measured by the County/Professional shall not exceed 45 dBA from 8 p.m. to 8 a.m. or 55 dBA 8 a.m. to 8 p.m. This sound level shall be measured at the exterior of the nearest exterior wall of the nearest residence. Levels at the equipment shall not exceed 85 dBA at any time. Sound levels in excess of these values are sufficient cause to have the Work halted until equipment can be quieted to these levels. Work stoppage by the County/Professional for excessive noise shall not relieve the Contractor of the other portions of this specification including, but not limited to, completion dates and bid amounts.
- C. No extra charge may be made for time lost due to work stoppage resulting from the creation of a public nuisance.

#### 1.06 CONTRACTOR'S PAYMENTS TO COUNTY FOR OVERTIME WORK

- A. **County Inspector Work Hours: Normal work hours for the County's inspector(s) are defined as any 8-hour period between the hours of 7:00 a.m. and 7:00 p.m. on the weekdays of Monday through Friday. Any County Inspector(s) work beyond the aforementioned normal work hours shall be requested in writing 48-hours in advance. All overtime, any County holidays or weekend work compensation for the County's Inspector(s) to work beyond the normal working hours are considered overtime compensation and shall be paid for by the Contractor. The overtime pay rate will be \$51.00 per hour or the most current rate as listed in the County Fee Directory prepared by the Office of Management and Budget, in section "Orange County Utilities Engineering & Construction", under the heading of "Inspection Fee other than Normal Working Hours". The Contractor agrees that the County shall deduct charges for work outside normal work hours and for overtime pay from payments due the Contractor.**

#### 1.07 LABOR

- A. Supervision: The Contractor shall supervise and direct the Work efficiently and with his best skills and attention. The Contractor shall have a competent, English speaking superintendent or representative, who shall be on the site of the Project at all working hours, and who shall have full authority by the Contractor to direct the performance of the Work and make arrangements for all necessary materials, equipment, and labor without delay.
- B. Jurisdictional Disputes: It shall be the responsibility of the Contractor to pay all costs that may be required to perform any of the Work shown on the Drawings or specified herein to avoid any work stoppages due to jurisdictional disputes. The basis for subletting work in question, if any, shall conform to precedent agreements and decisions on record with the Building and Construction Trades Department, AFL-CIO, dated June, 1973, including any amendments thereto.
- C. Apprenticeship: The Contractor shall comply with all of the requirements of Section 446, Florida Statutes, for all contracts in excess of \$25,000 excluding roadway,



highway or bridge contracts and the Contractor agrees to insert in any subcontract under this Contract the requirements of this Article.

## 1.08 MATERIALS AND EQUIPMENT

### A. MANUFACTURER

1. All transactions with the manufacturers or Subcontractors shall be through the Contractor, unless the Contractor and the County/Professional request that the manufacturer or Subcontractor communicate directly with the County/Professional. Any such transactions shall not in any way release the Contractor from his full responsibility under this Contract.
2. All workmanship and materials shall be of the highest quality. The equipment shall be the product of manufacturers who are experienced and skilled in the field with an established record of research and development. No equipment will be considered unless the manufacturer has designed and manufactured equipment of comparable type and size and have demonstrated sufficient experience in such design and manufacture.
3. No material shall be delivered to the Site without prior approval of the County/Professional.
4. All apparatus, mechanisms, equipment, machinery, and manufactured articles for incorporation into the Project shall be the new (most current production at time of bid) and unused standard products of recognized reputable manufacturers.
5. Manufactured and fabricated products:
  - a. Design, fabricate and assemble in accord with the best engineering and shop practices.
  - b. Manufacture like parts of duplicate units to standard sizes and gauges, to be interchangeable.
  - c. Any two or more pieces of material or equipment of the same kind, type or classification, and being used for identical types of service, shall be made by the same manufacturer.
  - d. Products shall be suitable for service conditions as specified and as stated by manufacturer.
  - e. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.
  - f. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

## 1.09 MANUFACTURER'S SERVICE

- A. Where service by the manufacturer is specified to be furnished as part of the cost of the item of equipment, the Work shall be at the Contractor's expense.
- B. The services provided shall be by a qualified manufacturer's service representative to check and verify the completed installation, place the equipment in operation, and instruct the County's operators in the operation and maintenance procedures. Such services are to be for period of time and for the number of trips specified. A working day is defined as a normal 8-hour working day on the job and does not include travel time.

- C. The services shall further demonstrate to the County/Professional's complete satisfaction that the equipment will satisfactorily perform the functions for which it has been installed.

## 1.10 INSPECTION AND TESTING

### A. General

1. All materials and equipment furnished by the Contractor shall be subject to the inspection, review and acceptance of the County and meet the requirements as outlined in the Orange County Utilities Standards and Construction Specifications Manual. If in the testing of any material or equipment it is ascertained by the County/Professional that the material or equipment does not comply with the Contract, the Contractor shall be notified thereof, and the Contractor will be directed to refrain from delivering said material or equipment, or to remove it promptly from the Site or from the Work and not accepted by the County shall be replaced with acceptable material, without cost to the County.
2. Tests of electrical and mechanical equipment and appliances shall be conducted in accordance with recognized test codes of the ANSI, ASME, or the IEE, except as may otherwise be stated herein.
3. The Contractor shall give notice in writing to the County sufficiently in advance of his intention to commence the manufacture or preparation of materials especially manufactured or prepared for use in or as part of the permanent construction. Such notice shall contain a request for inspection, the date of commencement and the expected date of completion of the manufacture or preparation of materials. Upon receipt of such notice, the County shall arrange to have a representative present at such times during the manufacture as may be necessary to inspect the materials; or the County will notify the Contractor that the inspection will be made at a point other than the point of manufacture; or the County will notify the Contractor that inspection will be waived.
4. When inspection is waived or when the County/Professional so requires, the Contractor shall furnish to the County authoritative evidence in the form of Certificates of Manufacture that the materials to be used in the Work have been manufactured and tested in conformity with the Contract Documents. These certificates shall be notarized and shall include five (5) copies of the results of physical tests and chemical analysis, where necessary, that have been made directly on the product or on similar products of the manufacturer.
5. The Contractor must comply with these provisions before shipping any material. Such inspections by the County shall not release the Contractor from the responsibility for furnishing materials meeting the requirements of the Contract Documents.

### B. Cost

1. County shall employ and pay for the services of an independent testing laboratory to perform testing indicated on the Contract Documents, or at the County's discretion to ensure conformity with the Contract Documents.
2. The cost of field leakage and pressure tests and shop tests of materials and equipment specifically called for in the Contract Documents shall be borne by the Contractor.

Such costs shall be deemed to be included in the Contract price.

3. The Contractor shall notify the County laboratory a minimum of 48-hours in advance of operations for scheduling of tests. When tests or inspections cannot be performed after such notice, the Contractor shall reimburse County for expenses incurred.
4. The Contractor shall pay for all work required to uncover, remove, replace, retest, etc., any work not tested due to the Contractor's failure to provide the 48-hours advance notice or due to failed tests. The Contractor shall also provide compensation for the County/Professional's personnel for required re-testing due to failed or rescheduled testing.

C. Shop Testing

1. Each piece of equipment for which pressure, duty, capacity, rating, efficiency, performance, function or special requirements are specified shall be tested in the shop of the manufacturer in a manner which shall conclusively prove that its characteristics comply fully with the requirements of the Contract Documents. No such equipment shall be shipped to the worksite until the County/Professional notifies the Contractor, in writing, that the results of such tests are acceptable.
2. The manufacturing company shall provide five (5) copies of the manufacturer's actual shop test data and interpreted results signed by a responsible official of the manufacturing company and notarized, showing conformity with the Contract Documents as a prerequisite for the acceptance of any equipment. The cost of shop tests (excluding cost of County's representative) and of furnishing manufacturer's preliminary and shop test data of operating equipment shall be borne by the Contractor and shall be included in the Contract price.

D. Field Testing:

1. The County shall employ and pay for services of an independent testing laboratory to perform testing specifically indicated in the Contract Documents. Employment of the laboratory shall in no way relieve Contractor's obligations to perform the Work of the Contract. The Contractor shall provide compensation for retesting of all failed tests.
2. The County may at any time during the progress of the Work, request additional testing beyond that which is specified in the Contract. This testing will be at the County's expense. Contractor shall:
  - a. Cooperate with laboratory personnel, provide access to the Project.
  - b. Secure and deliver to the laboratory adequate quantities of representative samples of materials proposed to be used and which require testing.
  - c. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other material mixes, which require control by the testing laboratory.

E. Demonstration Tests: Upon completion of the Work and prior to final payment, all equipment and piping installed under this Contract shall be subjected to acceptance or demonstration tests as specified or required to provide compliance with the Contract Documents. The Contractor shall furnish all labor, fuel, energy, water and all other equipment necessary for the demonstration tests at no additional cost to the County.

F. Final Inspection: Prior to preparation of the final payment application, a final inspection will be performed by the County to determine if the Work is properly and satisfactorily constructed in accordance with the requirements of the Contract Documents. See also

Section 01700 "Project Closeout."

- G. Inspection by Other Agencies: The Florida Department of Transportation, the Florida Department of Environmental Protection, and other authorized governmental agencies shall have free access to the site for inspecting materials and work, and the Contractor shall afford them all necessary facilities and assistance for doing so. Any instructions to the Contractor resulting from these inspections shall be given through the County. These rights of inspections shall not be construed to create any contractual relationship between the Contractor and these agencies.

1.11 PROJECT SITE AND ACCESS

A. ACCESS

- 1. Contractor agrees that representatives of the County and any governmental agents will have access to the Work wherever it is in preparation or progress and that the Contractor shall provide facilities for such access and inspection.

1.12 RELATED CONSTRUCTION REQUIREMENTS

A. DAILY REPORTS

- 1. The Contractor shall submit to the County's Representative daily reports of construction activities including non-work days. The reports shall be complete in detail and shall include the following information:
  - a. Days from Notice to Proceed; Days remaining to substantial and final completion.
  - b. Weather information
  - c. Work activities with reference to the Critical Path Method (CPM) schedule activity numbers (including manpower, equipment and daily production quantities for each individual activity).
  - d. Major deliveries
  - e. Visitors to site
  - f. Test records
  - g. New problems, and
  - h. Other pertinent information
- 2. A similar report shall be submitted for/by each Subcontractor.
- 3. The report(s) shall be submitted to the County Representative within 2 days of the respective report date. Each report shall be signed by the Contractor's Superintendent or Project Manager. Pay request will not be processed unless daily reports are current.
- 4. If a report is incomplete, in error, or contains misinformation, a copy of the report shall be returned by the County Representative to the Contractor's Superintendent or Project Manager with corrections noted. When chronic errors or omissions occur, the Contractor shall correct the procedures by which the reports are produced.

B. CLEANING

- 1. During Construction
  - a. During construction of the Work, the Contractor shall, at all times, keep the Site free from material, debris and rubbish as practicable and shall remove the same

from any portion of the Site if, in the opinion of the County, such material, debris, or rubbish constitutes a nuisance or is objectionable.

- b. Provide on-site containers for the collection of waste materials, debris and rubbish and remove such from the Site periodically by disposal at a legal disposal area away from the Site.
  - c. The Contractor shall remove from the site all surplus materials and temporary structures when no longer necessary to the Work at the direction of the County.
2. Final Cleaning
- a. At the conclusion of the Work, all equipment, tools, temporary structures and materials belonging to the Contractor shall be promptly taken away, and the Contractor shall remove and promptly dispose of all water, dirt, rubbish or any other foreign substances. Employ skilled workmen for final cleaning. Thoroughly clean all installed equipment and materials to a bright, clean, polished and new appearing condition. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.
  - b. The Work shall be left in an improved condition and the remainder of the site shall be restored to a condition equal or better than what existed before the Work.
  - c. Prior to final completion, or County occupancy, Contractor shall conduct an inspection of interior and exterior surfaces, and all work areas to verify that the entire Work is clean. The County will determine if the final cleaning is acceptable.

#### 1.13 CONSTRUCTION NOT PERMITTED

##### A. USE OF EXPLOSIVES

1. No blasting shall be done except as approved by the County and the governmental agency or political subdivision having jurisdiction.

#### **PART 2 - PRODUCTS (NOT USED)**

#### **PART 3 - EXECUTION (NOT USED)**

END OF SECTION

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**SECTION 01010**  
**SUMMARY OF WORK**

**PART 1 - GENERAL**

**1.01 WORK COVERED BY CONTRACT DOCUMENTS**

A. This Project involves the reconstruction of the Phase I/II Automatic Backwash Filters at the Eastern Water Reclamation Facility (EWRf). There are two (2) filters each 16 feet wide by 66 feet long. The record drawings of the filters from the 1983 project are included in scanned electronic format as part of the specifications. The contractor can use this information to prepare a bid. The contractor can also use this information to determine the access to the filters to determine placement of construction equipment and where he may place materials prior to installation and reconstruction. All work performed will be required to be done while the owner maintains functional operations at the EWRf. Only one filter can be taken out of service. The second unit cannot be removed from service until the first unit is complete and accepted by OCUD. This Project generally includes, but is not limited to the following:

- 1) Remove media and dispose of properly. The filters will remain as single media filters and utilize 11 inches of sand media.
- 2) Remove the underdrain components that consist of:
  - a. Porous plates
  - b. Sealant
  - c. Retaining angles
  - d. Hardware
- 3) Properly dispose of the items that are not being reused.
- 4) Furnish and install new porous plates, retaining angles, sealant and associated hardware.
- 5) Provide for 7 days curing time on the caulk.
- 6) Provide a temporary sun shade to protect the caulk, while curing, from rain, sunshine and heat.
- 7) Repair damaged cell dividers by installing a stainless steel cap on each damaged cell divider (it is estimated that there are 98 cell dividers that need repair).
- 8) Replace sand media.
- 9) Remove and replace the festoon power system cable wire, the signal cable wire, trolleys and associated hardware.
- 10) Sand blast, repair and recoat the festoon posts.
- 11) Replace the skimmer system.
- 12) Replace the backwash shoe assembly including upper and lower tensioning springs.
- 13) Add a wear strip (material - UHMW) to the effluent channel outlets to provide a smooth surface for the backwash shoe assembly. No waves or distortion in the

alignment of the wear strip will be allowed in order to provide a proper sealing surface between the shoe and the wear strip.

- 14) Replace the bridge assembly with all new components and a new stainless steel base unit.
- 15) Replace the backwash arm assembly with a stainless steel unit.
- 16) Reuse the influent and effluent ports, rails, cell dividers and washwater troughs.
- 17) Sand blast and re-paint the backwash trolley guiderails. Only the sides of the rails will be painted. The top of the rail shall remain uncoated.
- 18) Repair washwater troughs by installing new caulk in the joints to eliminate water leaks.
- 19) Replace the filter control panels with PLC type controls.
- 20) The existing filters provide “continuous” backwashing. There is no indexing system. This continuous backwashing capability will be maintained.
- 21) The existing electrical feed from the MCC to each existing filter is 460Volt – 30 Amp. Two (2) - 30 Amp separate breakers are provided in the MCC of the electrical room. The Contractor shall provide two separate feeds including new conduit, wire and a disconnect at the north end of each filter.

The Contractor shall furnish all labor, equipment, tools, services and incidentals to complete all Work required by these Specifications. If conflicts arise between these specifications and the latest OCU Standards and Construction Specification Manual, then the OCU Standards shall govern.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

END OF SECTION



**SECTION 01027**  
**APPLICATIONS FOR PAYMENT**

**PART 1 - GENERAL**

1.01 REQUIREMENT

- A. This Section specifies administrative and procedural requirements governing the Contractor's Applications for Payment.
- B. Prior to submitting a monthly payment application, the Contractor's progressive As-Built Drawings, As-Built Asset Attribute Data, Gravity Main, and Pipe Deflection Tables for the period covered by the monthly payment application shall be submitted and accepted by the County.

1.02 FORMAT

- A. Format and Content: Use the accepted Schedule of Values.
  - 1. Arrange the Schedule of Values in a tabular form with separate columns to indicate the following for each item listed:
    - a. Generic name
    - b. Related specification section
    - c. Name of subcontractor
    - d. Name of manufacturer or fabricator
    - e. Name of supplier
    - f. Dollar value
  - 2. Round amounts off to the nearest whole dollar. The total shall equal the Contract Amount.

1.03 PREPARATION OF APPLICATION

- A. Each Application for Payment shall be consistent with previous applications for payments as certified and paid for by the County.
- B. Payment Application Times: As stated in the General Conditions, Payment Applications shall be submitted monthly on a day of the month established by the County at the Pre-Construction Conference.
- C. Application Preparation: Contractor shall complete every entry on the Pay Application form. The form shall be executed by a person authorized to sign legal documents on behalf of the Contractor and the signature notarized. Incomplete applications will be returned without action. The following procedure shall be followed by the Contractor:
  - 1. Submit applications typed on forms provided by the County.
  - 2. Use data on Bid Form and approved Schedule of Values. Provide dollar value in each column for each line item for portion of Work performed and for stored products.

3. List each authorized Change Order and use additional sheets if necessary, list Change Order number and dollar amount for the original item of work.
  4. Each item shall have an assigned dollar value for the current pay period and a cumulative value for the project to-date.
  5. Submit stored material log, partial waivers of claims and mechanic liens, and Consent of Surety with each application, as further explained below.
- D. Contractor shall submit a stored material log with each application for payment that identifies the type, quantity, and value of all stored material that tracks when the stored materials were installed and deducts the installed material from the stored quantity at that time. Include original invoices for all stored materials for which payment is requested.
- E. Waivers of Claims and Mechanics Lien (Waivers): With each Application for Payment the Contractor shall submit waivers of claims and mechanic liens from Subcontractors, Sub-subcontractors, and suppliers for the construction period covered by the previous application.
1. The Contractor shall submit partial waivers on each item for the amount requested, prior to deduction for retainage, on each item.
  2. When an application shows completion of an item, the Contractor shall submit final or full waivers.
  3. The Contractor shall submit the final Application for Payment with, if not already submitted, the final waivers from every entity involved with performance of work covered by the Application that could lawfully be entitled to a payment claim or lien.
  4. Format of Waiver Forms: The Contractor shall submit executed waivers of claims and liens on forms acceptable to the County.
  5. The County reserves the right to designate which entities involved in the Work must submit waivers.
- F. Transmittal of Pay Applications: Contractor shall submit four (4) executed copies of each Application for Payment to the County. One (1) copy shall include all waivers of lien and similar attachments.
1. The Contractor shall transmit each Pay Application package with a transmittal form that lists attachments and all appropriate information related to the application. The transmittal form shall be acceptable to the County.
  2. The Contractor shall include a certification with each application stating that all previous payments received from the County under the Contract have been applied by the Contractor to discharge, in full, all obligations of the Contractor in connection with the Work covered by prior applications for payment. The Contractor shall also certify that all materials and equipment incorporated into the Work are free and clear of all liens, claims, security interest, and encumbrances.
- G. Initial Application for Payment Submittal: Administrative actions and submittals that must precede or coincide with submittal of the initial Application for Payment include the following:
1. List of Subcontractors
  2. List of principal suppliers and fabricators
  3. Schedule of Values
  4. Contractor's Construction Progress Schedule (accepted)

5. List of Contractor's staff assignments
  6. Copies of building permits
  7. Copies of authorizations and licenses from governing authorities for performance of the Work
  8. Certificates of insurance and insurance policies
  9. Performance and Payment bonds (if required)
  10. Data needed to acquire County's insurance
- H. Monthly Application for Partial Payment Submittals: Administrative actions and submittals that must precede or coincide with submittal of Monthly Applications for Partial Payment include the following, as applicable:
1. Relevant tests
  2. Progressive As-builts (one (1) paper copy and electronic copy)
  3. Table 01050-2 Asset Attribute Data Form Examples (one (1) paper copy and electronic copy)
  4. Table 01050-3 Pipe Deflection Table (one (1) paper copy and electronic copy)
  5. Table 01050-4 Gravity Main Table (one (1) paper copy and electronic copy)
  6. An electronic copy of all survey field notes
  7. Partial Release of Lien
  8. Partial Consent of Surety
  9. Site photographs
  10. Updated Progress Schedule: submit one (1) electronic copy and five (5) copies
  11. Summary of Values
  12. Pay Request
  13. On-Site Storage of materials
- I. Substantial Completion Application for Payment Submittal: Following issuance of the Certificate of Substantial Completion, Contractor shall submit an Application for Payment. This Application shall reflect any Certificates of Partial Substantial Completion issued previously for the County's occupancy of designated portions of the Work.
1. Administrative actions and submittals that shall precede or coincide with this application include:
    - a. Occupancy permits and similar approvals
    - b. Warranties (guarantees) and maintenance agreements
    - c. Test/adjust/balance records
    - d. Maintenance instructions
    - e. Meter readings
    - f. Start-up performance reports
    - g. Change-over information related to the County's occupancy, use, operation and maintenance
    - h. Final Cleaning
    - i. Application for reduction of retainage and consent of surety
    - j. Advice on shifting insurance coverage
    - k. List of incomplete Work, recognized as exceptions to County's Certificate of Substantial Completion

- J. Final Completion Application for Payment Submittal: Administrative actions and submittals which must precede or coincide with submittal of the final payment Application for Payment include the following:
1. Prior to submitting a request for final payment or the County issuing a Certificate of Completion for the Work, the Contractor shall submit the final Record Documents to the County for approval. Retainage funds will be withheld at the County's discretion based on the quality and accuracy of the final Record Documents.
  2. Written signed statements by the Contractor
    - a. Completion of project close-out requirements
    - b. Completion of items specified for completion after Substantial Completion
    - c. Assurance that unsettled claims are settled
    - d. Assurance that work not complete and accepted is now completed
  3. Transmittal of Record Documents to the County
  4. Proof that taxes, fees, and similar obligations have been paid
  5. Removal of temporary facilities and services has been completed
  6. Removal of surplus materials, rubbish, and similar elements
  7. Prepare Application for Final Payment as required in General Conditions

#### 1.04 PAY APPLICATION SUBSTANTIATING DATA

- A. When the County requires substantiating data for a Pay Application, submit data justifying Pay Application line item amounts in question.
- B. Provide one (1) copy of data with a transmittal letter for each copy of Pay Application submittal. The Pay Application number, date, and line item by number and description shall be clearly stated.

#### **PART 2 - PRODUCTS (NOT USED)**

#### **PART 3 - EXECUTION (NOT USED)**

END OF SECTION

**SECTION 01070**  
**ABBREVIATIONS AND SYMBOLS**

**PART 1 - GENERAL**

1.01 REQUIREMENTS INCLUDED

- A. Reference to the following standards of any technical society, organization or body shall be construed to mean the latest standard, code or specification or tentative specification adopted and published at the date of advertisement for bids, even though reference has been made to an earlier standard. Such reference is hereby made a part of the Contract the same as if herein repeated in full and in the event of any conflict between any of these specifications, standard codes or tentative specifications and the Contract Documents, the most stringent shall govern.

AA	Aluminum Association
AASHTO	American Association of State Highway and Transportation Officials
ABPA	Acoustical and Board Products Association
ACI	American Concrete Institute
AFBMA	Anti-Friction Bearing Manufacturer's Association
AGA	American Gas Association
AGMA	American Gear Manufacturers Association
AI	The Asphalt Institute
AIA	American Institute of Architects
AIEE	American Institute of Electrical Engineers
AIMA	Acoustical and Insulating Materials Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AMCA	American Moving and Conditioning Association
ANSI	American National Standards Institute
API	American Petroleum Institute
APWA	American Public Works Association
AREA	American Railway Engineering Association
ASA	American Standards Association (now ANSI)
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSCBC	American Standard Safety Code for Building Construction
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWBP	American Wood Preservers Board
AWS	American Welding Society
AWWA	American Water Works Association

CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standard
DOT Spec	Standard Specification for Road and Bridge Construction –
FDOT	Florida Department of Transportation
FAC	Florida Administrative Code
FS	Federal Standard
IEEE	Institute of Electrical and Electronic Engineers
IPCEA	Insulated Power Cable Engineers Association
NACE	National Association of Corrosion Engineers
NASSCO	National Association of Sewer Service Companies
NBFU	National Board of Fire Underwriters
NBS	National Bureau of Standards
NEC	National Electrical Code
NECA	National Electrical Contractor's Association
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NPT	National Pipe Threads
NSF	National Science Foundation
OSHA	U.S. Department of Labor, Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PS	United States Products Standards
SAE	Society of Automotive Engineers
SDI	Steel Decks Institute
SJI	Steel Joists Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SSPC	Structural Steel Painting Council
UL	Underwriter's Laboratories, Inc.
USASI	United States of American Standards Institute (Now ANSI)

## B. UNITS OF MEASUREMENT

CU FT	cubic feet
CU IN	cubic inch(es)
CY	cubic yard(s)
DegC	degree(s) Centigrade
DegF	degree(s) Fahrenheit
F	Fahrenheit
FT	feet, foot
G	gram(s)
GA	gage
GAL	gallon(s)
GPH	gallon(s) per hour
GPM	gallon(s) per minute

GPS	gallon(s) per second
HR	hour(s)
IN	inch(es)
IPS	iron pipe size
KG	kilogram(s)
L	liter(s)
LB	pound(s)
LBF-IN	pound (force) inch
LF	linear foot, linear feet
MIN. min.	minute(s), minimum
ml	milliliter
MO	month(s)
OZ	ounce(s)
QT	quart
RH	relative humidity
SF	square foot, square feet
SQ IN	square inch(es)
YD	yard(s)
YR	year(s)

### C. TERMINOLOGY

@	at
AB	anchor bolt
ADJ	adjust, adjustable
ADMIN	administration
AFG	above finished grade
AGGR	aggregate
AL	aluminum
ALT	alternate
APPX	appendix
APX	approximate
ART	article
ASPH	asphalt
ASSY	assembly
AUTO	automatic
AUX	auxiliary
AVE	avenue
AVG	average
AWG	American Wire Gauge
BAR	barrier
BCCMP	bituminous coated corrugated metal pipe
BL	base line
BLDG	building
BLKG	blocking
BM	beam

C to C	center to center
CCB	concrete block, masonry
CEM	cement
CIP	cast iron pipe, cast in place
CJ	construction joint
CL	center line, clearance
CM	Construction Manager
CMP	corrugated metal pipe
CO	cleanout
CONC	concrete
CONN	connection
CONST	construction
CONT	continuous
CONTR	contractor
CU, COP	copper
ORR	corridor
CRIT	critical
CTD	coated
CTR	center
CULV	culvert
d	delta
DBL	double
DEM	demolition, demolish
DEPT	department
DET	detail
DIA, D	diameter
DIAG	diagonal
DIM	dimension
DWG	drawing
FEM	female
FUT	future
FV	field verify
FM	force main
FH, HYD	fire hydrant
ID	inside diameter
MAS	masonry
MATL	material
MAX	maximum
MFD	manufactured
MFG	manufacturing
MFR	manufacturer
MH	manhole, metal hallide
MIN	minimum
MISC	miscellaneous
MTL	material



NAT	natural
NATL	national
NOM	nominal
NTS	not to scale
OD	outside diameter
PP	power pole
R	radius
Rd	road
REIN	reinforce
REL A	relief air
REQD	required
REV	revision
RR	railroad
R/W	right-of-way
RWM	reclaimed water main
RY	railway
SAN	sanitary
SCH	schedule
SECT	section
SLV	sleeve
SQ	square
SST	stainless steel
ST	street
STA	station
STD	standard
SURF	surface
SUSP	suspend(ed)
SYM	Symbol, symmetrical
SYS	system
TEMP	Temperature, temporary
TYP	typical
UTIL	utility
W	West
WLD	welded
WM	water main
W/O	without
WT	weight
YD	yard
YR	year
Y W	wye

END OF SECTION

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**SECTION 01091**  
**REFERENCE SPECIFICATIONS**

**PART 1 - GENERAL**

1.01 GENERAL

- A. Applicable Publications: Whenever in these Specifications references are made to published specifications, codes, standards, or other requirements, it shall be understood that wherever no date is specified, only the latest specifications, standards, or requirements of the respective issuing agencies which have been published as of the date that the Work is advertised for bids, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No requirements set forth herein or shown on the Drawings shall be waived because of any provision of or omission from said standards or requirements.
  
- B. Assignment of Specialists: In certain instances, specification test requires (or implies) that specific work is to be assigned to specialist or expert entities who must be engaged for the performance of the Work. Such assignments shall be recognized as special requirements over which the Contractor has no choice or option. These requirements shall not be interpreted so as to conflict with the enforcement of building codes and similar regulations governing the Work. They are not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of Work is recognized as "expert" for the indicated construction processes or operations. Nevertheless, the final responsibility for fulfillment of the entire set of Contract requirements remains with the Contractor.

1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Without limiting the generality of other requirements of the Specifications, all Work specified herein shall conform to or exceed the requirements of such referenced documents which are not in conflict with the requirements of these Specifications or applicable codes.
  
- B. References herein to "Building Code" shall mean the Florida Building Code. The latest edition of the code shall apply to the Work herein, including all addenda, modifications, amendments, or other lawful changes thereto.
  
- C. In case of conflict between codes, reference standards, Drawings, and the other Contract Documents, the most stringent requirements shall govern. All conflicts shall be brought to the attention of the Engineer for clarification and directions prior to ordering or providing any materials or labor. The Contractor shall bid the most stringent requirements.

D. Applicable Standard Specifications: The Contractor shall construct the Work specified herein in accordance with the requirements of the Contract Documents and the referenced portions of those referenced codes, standards, and specifications listed.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

END OF SECTION

**SECTION 01200**  
**PROJECT MEETINGS**

**PART 1 - GENERAL**

1.01 REQUIREMENTS INCLUDED

- A. Contractor participation in pre-construction conferences, progress meetings and specially called meetings.

1.02 MEETINGS CALLED BY THE COUNTY

- A. The County will schedule and administer a pre-construction conference, periodic progress meetings and specific topic meetings throughout the progress of the Work. The County will:
  - 1. Prepare and distribute a notification of the meeting to required attendees.
  - 2. Establish, prepare and distribute an agenda with the notification.
  - 3. Make physical arrangements for the meetings.
  - 4. Preside at meetings.
  - 5. Prepare and distribute minutes of meetings including significant proceedings and decisions, within 15 working days after each meeting. Minutes will be forwarded to all participants and to parties affected by decisions made at the meeting.
- B. Representatives of the Contractor, Subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.
- C. The meeting location will generally be a central site, convenient for all parties, designated by the County.
- D. All meetings shall be digitally recorded with files provided to all requesting parties.

1.03 PRE-CONSTRUCTION CONFERENCE

- A. Attendance:
  - 1. County
  - 2. Contractor and superintendent
  - 3. Subcontractors as appropriate to the agenda
  - 4. Representatives of suppliers and manufacturers as appropriate to the agenda
  - 5. County MBE/WBE representative
  - 6. Other agency representatives (FDEP, EPA, City, etc.)
  - 7. Others as requested by the County or Contractor

B. Suggested Agenda:

1. Distribution and discussion of:
  - a. List of major Subcontractors and suppliers
  - b. Construction schedules
  - c. Contact information
2. Organizational arrangement of Contractor's forces and personnel, and those of Subcontractors, material and equipment suppliers, and the County
3. Critical work sequencing
4. Major equipment deliveries
5. Project coordination
  - a. Designation of responsible personnel
  - b. Channels and procedures for communication
6. Procedures and processing of:
  - a. Field decisions
  - b. Proposal requests
  - c. Submittals
  - d. Change orders
  - e. Applications for payment/Schedule of Values
  - f. Contractor quality control
  - g. Submittal of Shop Drawings, project data and samples
7. Adequacy of distribution of Contract Documents
8. Use of premises:
  - a. Office, work and storage areas
  - b. County's requirements
  - c. Housekeeping
9. Temporary construction facilities
10. Temporary utilities
11. Safety and first aid procedures
12. Rules and regulations
13. Security procedures
14. Place, date and time for regular progress meetings
15. Completion time for Contract and liquidated damages

1.04 PROGRESS MEETINGS

- A. The County shall schedule progress meetings at least once per month as required by progress of the Work with the first meeting approximately one (1) month after the pre-construction meeting.
- B. Attendance:
  1. County
  2. Contractor
  3. Subcontractors as appropriate to the agenda
  4. Suppliers as appropriate to the agenda
  5. Others as appropriate

- C. The Contractor's representative is to attend the project meetings and have the authority to act on behalf of the entity represented on field related matters. Contractor's representative is to study previous meeting minutes and current agenda items, in order to be prepared to discuss pertinent topics and provide specific information including but not limited to:
1. Status of submittals and actions necessary to expedite them
  2. Status of activities behind schedule and actions necessary to regain the approved schedule
  3. Status of materials and equipment deliveries and action necessary to expedite materials and equipment and maintain the approved schedule
  4. Status of open RFI's and actions necessary to address them
- D. To the maximum extent practicable, the Contractor is to assign the same personnel to represent the Contractor at Progress Meetings throughout the progress of the work.
- E. The Contractor is to provide a current Shop Drawing submittal log at each progress meeting.
- F. The Contractor is to provide copies of the updated Progress Schedule at each project meeting in accordance with the General Conditions including a 3 week look ahead schedule for upcoming events.
- G. Suggested Agenda:
1. Review and approve minutes from previous meeting
  2. Review of work progress since previous meeting to include current As-Builts
  3. Contractor's/Subcontractor's workforce and equipment
  4. Field observations, problems and conflicts
  5. Construction progress and problems which impede construction schedule
  6. Shop Drawing submittal status
  7. Requests for Information (RFI) status
  8. Change Order status
  9. Review of off site fabrication and delivery schedules
  10. Corrective measures and procedures to regain approved schedule
  11. Revisions to construction schedule
  12. Job progress and schedule for succeeding work period
  13. Coordination of schedules
  14. Maintenance of quality standards
  15. Review submittal schedule; expedite as required
  16. Pending requests for information, changes and substitutions
  17. Review proposed changes for effect on construction schedule and completion date
  18. Pay application status
  19. Other business
- H. Revision to Minutes:
1. Unless minutes are challenged, in writing, prior to the next regularly scheduled Progress Meeting, they will be accepted as properly summarizing the discussions and decisions of the meeting.
  2. Persons challenging minutes shall reproduce and distribute copies of the challenge to

- all indicated recipients of the particular set of minutes.
3. Challenge to minutes shall be settled as priority portion of "old business" at next regularly scheduled meeting.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

END OF SECTION



## SECTION 01270

### MEASUREMENT AND PAYMENT - LUMP SUM CONTRACTS

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

Measurement and payment provisions, schedule of values.

##### 1.02 GENERAL MEASUREMENT AND PAYMENT PROVISIONS

- A. Payment for all work done in compliance with the Contract Documents, inclusive of furnishing all manpower, equipment, materials, and performance of all operations relative to construction of this project, will be made as a lump sum which will be complete payment for all work called for or reasonably inferable from the Contract Documents and other work will be considered incidental to the Contract and no additional compensation will be allowed.
- B. The Owner reserves the right to alter the Drawings, modify incidental work as may be necessary, and increase or decrease the work to be performed to accord with such changes, including deductions or additions to the scope of work outlined in the Contract Documents. Changes in the work shall not be considered as a waiver of any conditions of the Contract nor invalidate any provisions thereof. Changes resulting in changes in the scope or quantities of Work or time or other conditions of work will be basis for consideration of a Change Order which is to be negotiated and executed before proceeding with the work. A supplemental agreement between the Contractor and the Owner will be required when such changes meet the conditions described in the Supplementary Conditions. Work which has not been authorized by a written Change Order will not be subsequently considered for additional payment.
- C. The Contractor shall take no advantage of any apparent error or omission in the Drawings or Specifications, and the Engineer shall be permitted to make corrections and interpretations as may be deemed necessary for fulfillment of the intent of the Contract Documents.
- D. If the Contractor makes a claim for an extra or additional cost and requests a Change Order be issued prior to performing the work and the Engineer and/or Owner renders a decision denying such request, the Contractor must notify the Engineer in writing within three (3) days of the time that the Contractor is informed of the Engineer's decision. Otherwise the Owner will not consider any such difference as a claim for a Change Order or additional payment or time. Any such written notice received by the Engineer from the Contractor within the 3-day period shall be just reason for the Engineer to re-evaluate his previous decision.
- E. Failure on the part of the Contractor to construct any item to plan or authorized dimensions within the specification tolerances shall result in: reconstruction to acceptable

tolerances at no additional cost to the Owner; acceptance at no pay; or, acceptance at reduced price, all at the discretion of the Engineer.

- F. Work shall not be considered complete until all testing has been satisfactorily completed and the item of work has demonstrated compliance with plans and specifications.
- G. A preliminary monthly application for payment shall be submitted to the Owner/Engineer for review five (5) days prior to the submittal for approval of the Contractor's monthly payment request.

### 1.03 SCHEDULE OF VALUES

The Contractor shall submit a complete Schedule of Values for approval prior to commencing construction. As a minimum, include those values identified in Section 01370. The Complete Schedule of Values shall be the basis for making payment applications and establishing prices for Change Orders.

- A. The Contractor shall provide information as requested by the Engineer to substantiate prices included in the Schedule of Values.
- B. The total of all items in the Schedule of Values shall be equal to the Bid Price.
- C. The Complete Schedule of Values shall include, but not be limited to, the items on the attached Schedule of Values Table, with each item further described by Specification Division as listed in the Index to Project Manual.
- D. The attached Schedule of Values is intended to assist the Bidder in the preparation of their Complete Schedule of Values. The scope of work for this project as described in the contract documents includes, but is not limited to, the list of items on the attached Schedule of Values. In no case shall the complete Schedule of Values contain fewer items than listed.
- E. Please refer to Section 01370 for the Schedule of Values.

### **PART 2 - PRODUCTS (NOT USED)**

### **PART 3 - EXECUTION (NOT USED)**

END OF SECTION

## SECTION 01300

### SUBMITTALS

#### PART 1 - GENERAL

Work completed without approved Shop Drawings and/or samples shall be considered installed at the Contractor's risk.

##### 1.01 SHOP DRAWINGS AND DATA

- A. Shop Drawings defined in the General Conditions, shall complement design and construction Drawings, and shall contain sufficient detail to clearly define all aspects of the Construction. These Drawings shall be complete and detailed.
- B. Contractor and Supplier's catalog sheets, brochures, diagrams, illustrations and other standard descriptive data shall be clearly marked with specification title and numbers to identify pertinent materials, product or models. Delete information which is not applicable to the Work by striking or cross-hatching.
- C. If Shop Drawings show variations from Contract requirements because of standard shop practice or for other reasons, the Contractor shall describe such variations in the letter of transmittal. If acceptable, proper adjustment in the Contract shall be implemented where appropriate. If the Contractor fails to describe such variations, the Contractor shall not be relieved of the responsibility for executing the Work in accordance with the Contract, even though such Drawings have been reviewed.
- D. Data on materials and equipment shall include, without limitation, materials and equipment lists, catalog data sheets, cuts, performance curves, diagrams, verification of conformance with applicable standards or codes, materials of construction and similar descriptive material. Materials and equipment list shall, for each item, give the name and location of the Supplier or manufacturer, trade name, catalog reference, size, finish and all other pertinent data.
- E. For all equipment furnished, the Contractor shall provide a list including the equipment name and address and telephone number of the Supplier's representative and service company so that service and/or spare parts can be readily obtained.
- F. The Contractor will obtain an installation list from suppliers and equipment suppliers who propose to furnish equipment or products for submittal to County/Professional along with the required Shop Drawings. The installation list shall include at least 5 installations where identical equipment has been installed and has been in operation for a period of at least 1-year.

## 1.02 REVIEW OF SHOP DRAWINGS AND SAMPLES

- A. The County /Professional's review of Shop Drawings, Data, and Samples as submitted by the Contractor will be to determine if the items(s) generally conform(s) to the information in the Contract Documents and is/are compatible with the design concept. The County/Professional's review and exceptions, if any, will not constitute an approval of dimensions, connections, quantities, and details of the material, equipment, device, or item shown.
- B. The review of drawings and schedules will be general, and shall not be construed:
  - 1. As permitting any departure from the Contract Documents
  - 2. As relieving the Contractor of responsibility for any errors, including details, dimensions, and materials
  - 3. As approving departures from details furnished by the County/Professional, except as otherwise provided herein
- C. If the drawings or schedules as submitted describe variations and show a departure from the Contract Documents which the County/Professional finds to be in the interest of the County and to be so minor as not to involve a change in Contract Price or Contract Time, the County/Professional may return the reviewed drawings without noting an exception.
- D. "Approved As Noted": Contractor shall incorporate County/Professional's comments into the submittal before release to manufacturer. The Contractor shall send a letter to the County/Professional acknowledging the comments and their incorporation into the Shop Drawing.
- E. "Amend and Resubmit": Contractor shall resubmit the Shop Drawing to the County/Professional. The resubmittal shall incorporate the County/Professional's comments highlighted on the Shop Drawing.
- F. "Rejected": Contractor shall correct, revise and resubmit Shop Drawing for review by County/Professional.
- G. Resubmittals will be handled in the same manner as first submittals. For resubmittals the Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, to revisions other than the corrections requested by County/Professional on previous submissions. The Contractor shall make any corrections required by the County/Professional.
- H. If the Contractor considers any correction indicated on the Drawings to constitute a change to the Drawings or Specifications, the Contractor shall give written notice thereof to the County/Professional.

- I. When the Shop Drawings have been completed to the satisfaction of the County/Professional, the Contractor shall carry out the Construction in accordance therewith and shall make no further changes therein except upon written instructions from the County/Professional.
- J. No partial submittals will be reviewed. Submittals not deemed complete will be stamped "Rejected" and returned to the Contractor for resubmittal. Unless otherwise specifically permitted by the County/Professional, make all submittals in groups containing all associated items for:
  - 1. Systems
  - 2. Processes
  - 3. As indicated in specific Specifications Sections  
All drawings, schematics, manufacturer's product data, certifications, and other Shop Drawing submittals required by a system specification shall be submitted at one time as a package to facilitate interfaces checking.
- K. Only the County/Professional shall utilize the color "red" in marking Shop Drawing submittals.
- L. Failure to comply with any of the above may result in the rejection of Shop Drawings.

#### 1.03 PRODUCT DATA

- A. Submit not less than 6-copies, unless approved by the County/Professional. Mark each copy to identify applicable products, models, options and other data. Supplement manufacturers' standard data to provide information unique to the Work.

#### 1.04 MANUFACTURERS' INSTRUCTIONS

- A. When required in an individual Specification Section, submit manufacturer's printed instructions for delivery, storage, assembly, installation, start-up, adjusting and finishing, in quantities specified for product data.

#### 1.05 SAMPLES

- A. Submit full range of manufacturers' standard colors, textures and patterns for the County's selection. Submit samples for selection of finishes within 30-days after Award of Contract. All color and finish selections must be submitted by the Contractor in a single submission, properly labeled and identified.
- B. Submit samples to illustrate functional characteristics of the product, with integral parts and attachment devices. Coordinate submittal of different categories for interfacing work.

- C. Submit the number of samples specified in the respective Specification section, but no less than two (2). After review one (1) will be retained by the County. Reviewed samples that may be used in the Work are indicated in the Specification Section.
- D. Samples shall be delivered to the County as directed. The Contractor shall prepay shipping charges on samples. Materials or equipment for which samples are required shall not be used in the Work until approved by the County/Professional.
- E. Samples shall be of sufficient size to clearly illustrate:
  - 1. Functional characteristics of the product, with integrally related parts and attachment devices
  - 2. Full range of color, texture and pattern
  - 3. Each sample shall have a label indicating:
    - a. Name of Project
    - b. Name of Contractor and Subcontractor
    - c. Material or equipment represented
    - d. Place of origin
    - e. Name of product and brand (if any)
    - f. Location in Project
    - g. Specification title and number
    - h. Submittal number
    - i. Note: Samples of finished materials shall have additional marking that will identify them under the finished schedules.
- F. The Contractor shall prepare a transmittal letter, in triplicate (3) for each shipment of samples containing the information required in paragraph herein. The Contractor shall enclose a copy of this letter with the shipment and send a copy of this letter to the County/Professional. Approval of a sample shall be only for the characteristics or use named in such approval and shall not be construed to change or modify any Contract requirements.
- G. Approved samples not destroyed in testing shall be sent to the County or stored at the site of the Work. Approved samples of the hardware in good condition may be incorporated in the Work if requested in writing by the Contractor and approved in writing by the County/Professional. Samples that failed testing or were not approved will be returned to the Contractor at the Contractor's expense, if so requested at time of submission.

#### 1.06 FIELD SAMPLES

- A. Provide field samples of finishes as required by individual Specifications sections. Install the sample completely and finished. Acceptable samples in place may be retained in completed Work.

#### 1.07 DRAWINGS, PRODUCT DATA AND CERTIFICATES

- A. Each letter of transmittal shall identify each and every item transmitted by title, drawing number, revision number and date.

- B. The County generally will not check dimensions, quantities or schedules, except in cases where the information is lacking in the Specifications.
- C. The following is applicable to submitted drawings, data and certificates:
  - 1. Show relation to adjacent structures or materials.
  - 2. Clearly identify field dimensions.
  - 3. Show required dimensions and clearances.
  - 4. Performance characteristic and capabilities shall accompany original Shop Drawing submittals.
  - 5. Wiring diagrams and controls shall accompany original Shop Drawing submittals.
  - 6. Installation instructions shall accompany original Shop Drawing submittals.
  - 7. Each submittal shall identify applicable Standards, such as ASTM number or Federal Specification number.
  - 8. All information not pertinent shall be removed from the submittal, or shall be crossed out.
- D. When resubmission is required, the County/Professional will return only two (2) marked up copies. A third submission from the same manufacturer will not be accepted.

#### 1.08 SUBSTITUTIONS

- A. The substitution requirements of this Section are in addition to the requirements of the General Conditions and Supplementary Conditions.
- B. When a particular product is specified or called for, it is intended and shall be understood that the proposal tendered by the Bidder includes those products in his Bid. Substitutions will only be considered in cases where original materials are unavailable or in an instance where substitute can be proven superior in its planned application
- C. The intent of these specifications is to provide the County with a quality facility without discouraging competitive bidding. For products specified only by reference standards, performance and descriptive methods, without naming manufacturer's products, the Contractor may provide the products of any manufacturer complying with the Contract Documents, subject to the review of product data by the County/Professional as specified herein.
- D. The County/Professional's approval is required for substitutions.
- E. The Contract is based on the materials, equipment and methods described in the Contract Documents.
- F. The County/Professional will consider proposals for substitution of materials equipment and methods only when such proposals are accompanied by full and complete technical data and all other information required by the County/Professional to evaluate the proposed substitution.

- G. Do not substitute materials, equipment or methods unless such substitution has been specifically approved for this Work by the County/Professional in writing. The Contractor must provide a submittal per this Section specifically requesting approval of the substitution. Failure to specifically identify the requested substitution may invalidate approval of a submittal.

#### 1.09 AVAILABILITY OF SPECIFIED ITEMS

- A. Verify prior to bidding that all specified items will be available in time for installation during Construction for orderly and timely progress of the Work.
- B. In the event that specified items will not be available, notify the County/Professional prior to receipt of proposals.

#### 1.10 OPERATING MANUALS

- A. Submit all manuals in accordance with requirements of Divisions 2 through 16 of the Contract Specifications and Section 01700 "Project Closeout."

#### 1.11 WARRANTIES, GUARANTEES AND BONDS

- A. Provide as required by Technical Sections of the Specifications and Sections 01700 "Project Closeout" and Section 01740 "Warranties and Bonds."

#### 1.12 CADD FILES

- A. The Professional's CADD files will be available on a limited basis to qualified firms at the County's prerogative. The procedure for requesting such files is noted elsewhere in these documents and there is a cost associated with handling and reproduction. Recipients are cautioned that these files may not accurately show actual conditions as constructed. Users are responsible to verify actual field conditions.
- B. The Professional's Drawings are to be used only for background information. If the Professional's Drawings are just reproduced and resubmitted (e.g. for ductwork drawings) they will be rejected.
- C. Copies of data furnished by the County/Professional to Contractor or Contractor to County/Professional that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.



- D. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60-days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.
- E. When transferring documents in electronic media format, the transferring party makes no representations as to long-term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

### 1.13 PROGRESS PHOTOGRAPHS

- A. Photographs and digital pictures shall be in color. Provide 1 copy of each digital picture on each of three (3) CDs and provide 1 print of each photograph in two (2) separate albums.
- B. Photographs shall be from locations to illustrate the condition of Construction and state of progress adequately.
- C. Provide up to 12 digital photographs of views randomly selected by the County, taken prior to any construction and prior to each scheduled Application for Payment.
- D. Deliver electronic images, prints, and negatives to the County.
- E. Each print shall be single weight paper with glossy finish and the overall dimension shall be 7-1/2-inch x 10-inches (19.05 x 25.4 cm). The print shall be clear, sharp and free of distortion after the enlargement from the negative.
- F. Provide loose-leaf albums for each set of photographs to hold prints with a maximum of 50-leaves per binder.
- G. Each print shall be protected by flexible, transparent acetate or plastic sheet protector leaves with metal reinforced holes. Two (2) extra leaves shall be provided in each binder.
- H. Capture and provide digital, ortho-rectified, true-color, aerial photographs of the complete project site prior to start of Construction and at final completion. A final 6-inch or less ground pixel resolution is required. If using traditional photography, the photos will need to be captured at an appropriate scale and scanned at a high enough dpi to yield a final ground pixel size of 6-inches or less. If captured digitally, a final 6-inches or less ground sample distance is required. The final orthorectified photos shall use a projection of NAD 27, State Plane West and all vertical reference shall be NAVD 88, US feet. All orthophoto mosaics shall meet a final accuracy of plus or minus 5-feet.

- I. Provide a total of four (4) true-color, color balanced orthophoto mosaic prints. Three (3) prints each of the pre and post construction (final completion) orthophoto mosaics, for a total of six (6). Each orthophoto mosaic print shall be on double-weight paper with glossy finish and shall have overall dimensions of 36-inches x 58-inches. Two (2) copies of each of the digital orthophoto mosaics shall be supplied in Geotiff format on disk for each time period (pre and post construction). The final color balanced, true-color orthophoto mosaics will be projected in NAD 27, State Plane West and all vertical reference shall be NAVD 88, US feet and shall meet a final accuracy of plus or minus 5-feet.
- J. The Contractor shall provide before and after photographs of each portion of the site. The below ground facilities shall include all equipment, walls, floor, piping, supports and entrance. At major locations, photographs shall include before, during, and after prints and all prints shall be placed in binders in ascending date order to show the Work as it progresses.
- K. Descriptive Information:
  - 1. Each photograph shall have a permanent title block on the back and shall contain the typed information and arrangement as follows:
    - a. ORANGE COUNTY, FLORIDA
    - b. (ENTER PROJECT NAME)
    - c. BID No. (Enter Bid Number)
    - d. CONTRACTOR: (Name of Contractor)
    - e. DATE: (When photo was taken)
    - f. PHOTO NO.: (Consecutive Numbers)
    - g. PHOTO BY: (Firm Name of Photographer)
    - h. LOCATION: (Description of Location and View)
  - 2. The Contractor shall provide the Professional with a written description of each photograph. This description shall be included in the binders and a copy shall be submitted with the CDs.

#### 1.14 PROJECT RECORD DOCUMENTS

Project Record Documents shall be submitted in accordance with Section 01720 "Project Record Documents" of these specifications.

### **PART 2 - PRODUCTS (NOT USED)**

### **PART 3 - EXECUTION**

#### 3.01 SUBMITTAL PROCEDURES

- A. Article 9 of the General Conditions contains additional provisions regarding submittals.

- B. Preliminary Shop Drawing Data: Within 20-days after the Award of the Contract or before the Pre-Construction Meeting, the Contractor shall submit to the County/Professional a complete listing of manufacturers for all items for which Shop Drawings are to be submitted.
- C. Shop Drawing Submittal Schedule: Within 30-days after the Notice to Proceed, the Contractor shall submit to the County/Professional a complete schedule of Shop Drawings submittals with the respective dates for submission, the beginning of manufacture, testing and installation of materials, supplies and equipment, noting those submittals critical to the progress schedule.
- D. Submittal Log: An accurate updated log of submittals will be maintained by the Contractor and subject to review by the County/Professional at each scheduled progress meeting.
- E. If the Contractor considers any correction indicated on the Drawings to constitute a change to the Contract Drawings or specifications, the Contractor shall give written notice thereof to the County/Professional. This does not constitute a change order until accepted by the County.
- F. Shop Drawing and submittal data shall be reviewed by the County/Professional for each original submittal and first resubmittal; thereafter review time for subsequent resubmittals shall be charged to the Contractor. The Contractor shall reimburse the County for services rendered by the County/Professional at the rate multiplied by the County's Professional multiplier based on the fee schedule provided to the County for this Project. If a County engineer is performing any portion of the review, this fee is based upon the hourly rate of the engineer times the County's multiplier for overhead, benefits, and expenses. The Contractor agrees that the County shall deduct such charges from the Contract Amount by a deductive Change Order.
- G. Contractor Shop Drawing and Sample submittals shall include 5 copies in addition to any other copies that the Contractor wants returned. The County will retain 5 copies of approved submittals.
- H. Identify Project, Project Number, date, dates of previous submittals, Contractor, Sub-Contractors, suppliers with their addresses, pertinent Drawings by sheet and detail number, and Specification Section number, as appropriate. Identify all deviations from the Contract Documents. Provide space for Contractor and Professional review stamps.
- I. Contractor's delivery of Shop Drawings for review shall follow a reasonable sequence, as is necessary to support the dates on the Progress Schedule and avoid an overload of Shop Drawings awaiting review at any one time. Coordinate submittal of related items.

- J. Submit Shop Drawings per the schedule of Shop Drawing submittals, inserted in 1 loose-leaf binder, with tabs and index to the County/Professional. All individual submittal sheets inserted in said binder must be clearly marked and referenced to proper paragraph and subparagraph of specifications. Cross out any items on sheets which constitute information not pertaining to equipment specified. Clearly mark all components that are provided as "optional" by manufacturer. Shop Drawings shall be approved by the Contractor prior to submittal to the County/Professional. Shop Drawings will be reviewed by the County/Professional. After County/Professional approval, reproduce and distribute in accordance with requirements herein.
- K. All submissions of Shop Drawings, brochures and catalog cuts shall be accompanied by a transmittal letter listing the Drawings submitted by number and title.
- L. When engineering calculations and/or professional certification of performance criteria of materials, systems, and/or equipment are required, the County is entitled to rely upon the accuracy and completeness of such calculations and certifications submitted by the Contractor. Calculations, when required, shall be submitted in a neat, clear and in an easy to follow format. Such calculations and/or certifications shall be signed and sealed by a Professional Engineer registered in the State of Florida.
- M. Distribute copies of reviewed submittals to concerned parties. Instruct recipients to promptly report any inability to comply with provisions.
- N. Prior to submission of Shop Drawings and samples, the Contractor shall stamp and sign the submittals. Any submission which, upon examination by the County, shows evidence of not having been thoroughly checked, or is not in compliance with the provisions of this Section will be returned to the Contractor for completion before it will be considered for review.
- O. Notify the County of the need for making any changes in the arrangement of piping, connections, wiring, manner of installation, etc., which may be required by the material or equipment Contractor proposes to supply.
- P. On resubmittals, direct specific attention in writing or on the revised Drawings or sample to revisions other than the corrections required by County on previous submissions.
- Q. All drawings, schematics, manufacturer's product data, certifications and other drawing submittals required for a system specification shall be submitted at one time as a package to facilitate interface checking.
- R. The County will distribute Shop Drawings as follows for the indicated action taken:

## SHOP DRAWING SUBMITTAL DISTRIBUTION

Representative Party	No Exception Taken or Make Correction Noted			Rejected or Revise & Resubmit		
	Submittal Transmittal	Shop Drawing	Review Comment Sheet	Submittal Transmittal	Shop Drawing	Review Comment Sheet
Engineer	2 Copies	File Copy	1 Copy	Original	File Copy	1 Copy
Contractor (see Note 1)	2 Copies	1 Copy Each Submittal	1 Copy	1 Copy	All Copies Except Engineers	1 Copy
County	1 Copy	1 Copy Each Submittal	1 Copy	1 Copy	None	1 Copy
Inspector	2 Copies	1 Copy Each Submittal	1 Copy	1 Copy	None	1 Copy
Project Record Data (see Note 2)	1 Copy	1 Copy Each Submittal	1 Copy	1 Copy	None	1 Copy

**NOTES:**

1. Contractor shall distribute additional copies to Subcontractors as required.
2. Stored by Contractor to be furnished to County upon closeout.

- S. All Shop Drawings shall be accompanied with a transmittal letter providing the following information:
1. Project Title and Contract Number
  2. Date
  3. Contractor's name and address
  4. The number of each Shop Drawing, project data, and sample required
  5. Notification of Deviations from Contract Documents
  6. Submittal Log Number conforming to specification section numbers
    - a. Submit each specification section separately.
    - b. Identify each Shop Drawing item required under respective specification section.
    - c. Identify resubmittal using specification section followed by A (first resubmittal), B (second resubmittal)...etc.

### 3.02 CONTRACTOR'S REVIEW

- A. Contractor's Responsibility for Coordination: Where the dimension, size, shape, location, capacity or other characteristic affects another item, and where the Contractor selects, fabricates or installs related or adjacent products to be used, the Contractor shall be responsible for coordination of related items. The Contractor shall insure that a proper exchange of information takes place prior to or during preparation of each submittal and that submittals reflect such coordination. The notation "verify" or "coordinate" on the Drawings indicates the necessity for Contractor coordination in the particular instances used.

- B. Contractor's Checking: When checking submittals from Subcontractors and suppliers, the Contractor shall mark all sets, indicating his corrections and comments in blue or green. Copies marked in red may be returned for revision.
- C. The Contractor is responsible to deliver and pick-up all submittals in a timely manner at the County/Professional's designated office. The Contractor is responsible for all related costs and expenses for the transmittal of such submittals.

### 3.03 COUNTY'S / PROFESSIONAL'S REVIEW

- A. Corrections or comments made on Shop Drawings during review do not relieve the Contractor from compliance with the requirements of Drawings and Specifications. This check is only for review of general conformance with the design concept of this Project and general compliance with information given in Contract Documents. Any substitutions or changes shall be properly noted.
- B. No action will be taken on "rough-in" Shop Drawings for plumbing and electrical connections when the items of equipment are not included in the same submittal.
- C. Review Time:
  - 1. On a normal basis, each submittal will be returned to the Contractor within 15 working days of the date it is received. Some submittals may require additional time.
  - 2. If, for any reason, the above schedule cannot be met, the Contractor will be so informed within a reasonable period and the Schedule of Submittals revised. If the specific submittal affects the critical path, the Contractor shall immediately notify the County/Professional in writing. In the event of separate submittals of individual components of a system, these submittals may be held until all components of the system are submitted, and the Contractor will be so notified.

END OF SECTION

**SECTION 01301**  
**PRODUCT SUBSTITUTIONS**

**PART 1 - GENERAL**

1.01 SUMMARY

A. General

1. Base all bids on materials and equipment specified in the Appendix D Orange County Utilities List of Approved Products.
2. Certain types of equipment and kinds of material are described in specifications by means of references to names of manufacturers and vendors, trade names, or catalog numbers.
  - a. When this method of specifying is used, it is not intended to exclude from consideration other products bearing other manufacturer's or vendor's names, trade names, or catalog numbers, provided said products are "or-equals," as determined by County/Professional.
3. Other types of equipment and kinds of material may be acceptable substitutions under the following conditions:
  - a. Or-equals are unavailable due to strike, discontinued production of products meeting specified requirements, or other factors beyond control of Contractor; or,
  - b. Contractor proposes a cost and/or time reduction incentive to the Owner.

1.02 QUALITY ASSURANCE

A. In making request for substitution or in using an approved product, Contractor:

1. Has investigated proposed product, and has determined that it is adequate or superior in all respects to that specified, and that it will perform the function for which it is intended.
2. Will provide same guarantee for substitute item as for product specified.
3. Waives all claims for additional costs related to substitution which subsequently arise.

1.03 DEFINITIONS

- A. Product: Manufactured material or equipment.

1.04 PROCEDURE FOR REQUESTING SUBSTITUTION

A. Substitution shall be considered only:

1. After award of Contract
2. Under the conditions stated herein

- B. Written request through Contractor only.

C. Transmittal Mechanics

1. Follow the transmittal mechanics prescribed for Shop Drawings in Specification Section 01300 "Submittals."
  - a. Product substitution will include in the transmittal letter, either directly or as a clearly marked attachment, the items listed in Paragraph D below.

D. Transmittal Contents

1. Product identification:
  - a. Manufacturer's name
  - b. Telephone number and representative contact name
  - c. Specification Section or Drawing reference of originally specified product, including discrete name or tag number assigned to original product in the Contract Documents.
2. Manufacturer's literature clearly marked to show compliance of proposed product with Contract Documents.
3. Itemized comparison of original and proposed product addressing product characteristics including but not necessarily limited to:
  - a. Size
  - b. Composition or materials of construction
  - c. Weight
  - d. Electrical or mechanical requirements
4. Product experience
  - a. Location of past projects utilizing product.
  - b. Name and telephone number of persons associated with referenced projects knowledgeable concerning proposed product.
  - c. Available field data and reports associated with proposed product.
5. Data relating to changes in construction schedule.
6. Data relating to changes in cost.
7. Samples
  - a. At request of County/Professional.
  - b. Full size if requested by County/Professional.
  - c. Held until substantial completion.
  - d. County/Professional is not responsible for loss or damage to samples.

1.05 APPROVAL OR REJECTION

- A. Written approval or rejection of substitution to be given by the Engineer.
- B. Engineer reserves the right to require proposed product to comply with color and pattern of specified product if necessary to secure design intent.
- C. In the event the substitution is approved, the resulting cost and/or time reduction will be documented by Change Order in accordance with the General Conditions.
- D. Substitution will be rejected if:
  1. Submittal is not through the Contractor with his stamp of approval.
  2. Request is not made in accordance with this Specification Section.



3. In the County/Professional's opinion, acceptance will require substantial revision of the original design.
  4. In the County/Professional's opinion, substitution will not perform adequately the function consistent with the design intent.
- E. Contractor shall reimburse the County for the cost of the evaluation whether or not substitution is approved.

**PART 2 - PRODUCTS - (NOT USED)**

**PART 3 - EXECUTION - (NOT USED)**

END OF SECTION

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**SECTION 01310**  
**PROGRESS SCHEDULES**

**PART 1 - GENERAL**

**1.01 REQUIREMENT**

- A. The Contractor will submit precedence method cost loaded Critical Path Method (CPM) Progress Schedules to the County depicting the approach to prosecution and completion of the Work. This requirement includes, but is not limited to the Contractor's approach to Activity cost loading, recovering schedule and managing the effect of changes, substitutions and Delays on Work sequencing.
- B. The Progress Schedule shall show how the Contractor's priorities and sequencing for the Work (or Work remaining) conform to the Contract requirements and the sequences of Work indicated in or required by the Contract Documents; reflect how the Contractor anticipates foreseeable events, site conditions and all other general, local and prevailing conditions that may affect cost, progress, schedule, furnishing and performance of the Work; and show how the Contractor's Means and Methods translate into Activities and logic.
- C. The Progress Schedule will consist of the Initial Submittal, Payment Submittals and Revision Submittals. Upon acceptance by the County, the Initial submittal will become the As-Planned Schedule for the Work. Revision submittals upon acceptance will become the As-Planned Schedule for the Work remaining to be completed as of the submittal date for that Revision.
- D. References to the Critical Path Method (CPM) are to CPM construction industry standards that are consistent with the requirements of this Section.

**1.02 GLOSSARY OF TERMS**

- A. The following terms, whether or not already defined elsewhere in the Contract Documents, have the following intent and meanings within this Section:
  - 1. Activity Value (Value): That portion of the Contract Price representing an appropriate level of payment for the part of the Work designated by the Activity.
  - 2. As-Planned Schedule: The first, complete Initial Progress Schedule submitted by the Contractor with the intent to depict the entire Work as awarded and accepted by the County or returned as no resubmittal required.
  - 3. Contract Float: Days between the Contractors anticipated date for completion of the Work, or of a specified portion of the Work, if any, and the corresponding Contract Time.

4. CPM Schedule: The Progress Schedule based on the Critical Path Method (CPM) of scheduling. The term Critical Path means any continuous sequence of Activities in the Progress Schedule controlling, because of their sum duration, the Early Date of a pertinent, specified Contract Time.
5. Early/Late Dates: Early/late times of performance, based on CPM calculations, for an Activity in the Progress Schedule. Early Dates will be based on proceeding with all or part of the Work on the date when the corresponding Contract Time commences to run. Late Dates will be based on completing all or part of the Work on the corresponding Contract Time, even if the Contractor plans early completion.
6. Milestones: Key, pre-determined points of progress in the completion of a facility, denoting interim targets in support of the Contract Times. Milestones may pinpoint targets for key excavation and substructure events, significant deliveries, critical path transition from superstructure to piping and electrical rough in and building enclosure. Also, hook-up of mechanical and electrical equipment, availability of power for testing, equipment shakedown, training of County personnel, start-up, Substantial Completion and other events of like import.
7. Official Schedule: The Initial or most recent Revision Submittal accepted by the County or returned as no resubmittal required and the basis for Payment Submittals until another Revision Submittal is submitted and accepted. The accepted Initial Submittal is also the As-Planned Schedule.
8. Payment Submittal: A monthly Progress Schedule update reflecting progress and minor adjustments on the Activities, sequencing and restraints for Work remaining.
9. Total Float: Days by which an activity may slip from its Early Dates without necessarily extending a pertinent Contract Time. Total Float at least equals Contract Float. Total Float may also be calculated and reported in working Days. When an activity is delayed beyond Early Dates by its Total Float it becomes a Critical Path activity and if delayed further will impact a Contract Time.

### 1.03 QUALITY ASSURANCE

- A. The Contractor may self-perform the Work covered by this Section or employ a Subcontractor, subject to the County's consent. Employment of a scheduling Subcontractor shall not in any way alter or reduce the Contractor's obligations under the Contract Documents.
- B. The Contractor will obtain a written interpretation from the County, if the Contractor believes that the selection of activities, logic ties and/or restraints requires a written interpretation of the Contract Documents. With each submission, the Contractor will point out by specific, written notation, any Progress Schedule feature that may reflect variations from any requirements of the Contract Documents.
- C. It is the Contractor's responsibility to obtain information directly from each Subcontractor and Supplier when scoping their respective Activities, Values, logic ties and restraints.

- D. Neither Acceptance nor Review of any Progress Schedule will relieve the Contractor from the obligation to comply with the Contract Times and any sequence of Work indicated in or required by the Contract Documents and to complete, within the Contract Times, any Work omitted from that Progress Schedule.
- E. Neither Acceptance nor Review of any Progress Schedule will imply approval of any interpretation of or variation from the Contract Documents, unless expressly approved by the County through a written interpretation or by a separate, written notation on the returned Progress Schedule Submittal.

#### 1.04 MILESTONES AND SCHEDULE RECOVERY

- A. The County will select Milestones and Milestone Dates on the basis of the As-Planned Schedule. As the Official Schedule is revised, Milestone Dates will be revised accordingly. Milestone Dates will serve as target dates.
- B. Whenever any Activity slips by 14 or more Days from the Late Date for an activity in the Official Schedule, Milestone Dates selected by the County, or a pertinent Contract Time, the Contractor will deliver a Revision Submittal documenting the Contractor's schedule recovery plan and/or a properly supported request for an extension in the Contract Time. The narrative will identify the Delay and actions taken by the Contractor to recover schedule, whether by adding labor, Subcontractors or construction equipment, activity re-sequencing, expediting of submittals and/or deliveries, overtime or shift Work, and so forth. Activity shortening and overlapping shall be explained as to their basis (and be supported by increases in resources).
- C. Upon evaluation of that Revision Submittal, if the County determines there is sufficient cause, the County may withhold liquidated damages or provide a notice of intent to do so, if schedule is indeed not recovered, and/or may give a notice of default.

#### 1.05 PROGRESS SCHEDULE SOFTWARE

- A. The scheduling software employed by the Contractor to process the Progress Schedule will be the current version of Primavera P6.0®, or Primavera® Contractor 5.0 CPM scheduling software.
- B. If the Contractor intends to use companion schedule reporting, analysis or graphics software tools, the Contractor will furnish to the County descriptive materials and samples describing such software tools.

#### 1.06 NON-PERFORMANCE

- A. The County may refuse to recommend all or any part of any payment, if the Contractor fails, refuses or neglects to provide the required Progress Schedule information on a timely basis. Partial payments without a properly updated Progress Schedule shall be returned to the Contractor as non-conforming.

- B. If justified under the circumstances, the County also may prepare alternate Progress Schedules, as appropriate, and deduct from the Contract Amount all related costs by Change Order and/or take other action commensurate with the breach.

#### 1.07 REPORTS, SCHEDULES AND PLOTS

- A. Schedule Reports will include Activity (ID) code and description, duration, calendar, Early Dates, Late Dates and Total Float. Separate Schedule Reports will tabulate, for each Activity, all preceding and succeeding logic types and lead times, whether CPM Plots displaying logic ties are appended or not.
- B. CPM Schedule Plots will be plotted on a suitable time scale and identify the Contract Times, Critical Paths, phases and work areas on 24-inch x 36-inch or smaller sheets. Activities will be shown on the Early Dates with Total Floats noted by Late Date flags. For Payment and Revision Submittals plot a target comparison based on the current Official Schedule.
- C. The Activity Value report will tabulate Activity code and description and Activity Value, percent complete and earned value as calculated by the scheduling software. Cash flow plots shall be provided showing the monthly and cumulative actual and planned earned values with curves shown for Early and Late Dates in the schedules. For Payment and Revision Schedule submittals, the cash flow curves shall also plot the most current Official Schedule planned earnings curves.
- D. Each submittal shall include listings of all added and deleted activities, logic, constraints, Activity Value changes and update information vs. the previous Progress Schedule submittal. This list may be manually prepared or generated by accessory software that will generate such listings.

#### 1.08 NARRATIVE REQUIREMENTS

- A. The Initial Submittal narrative will describe the Contractor's approach to prosecution of the Work and the basis for determination of activity durations, sequence and logic, including the Contractor's management of the site, e.g., lay down, staging, parking, etc.; Contractor's phasing of the Work; use of crewing and construction equipment; identification of non-work County/Professional's, shifts, weekend Work and multiple calendars applied to activities and an explanation of the basis for restraint dates.
- B. Revision and Payment Submittal narratives will explain any changes to the approach or planning referred to in Paragraph A above on account of any change, delay, schedule recovery, substitution and/or Contractor-initiated revision occurring since the previous submittal.
- C. Each narrative will list the Critical Path Activities and compare Early and Late Dates against Contract Times and Milestone Dates. Narratives shall also recap progress and Days gained or lost vs. the current Official Schedule, and identify delays, their extent and causes.

- D. The Initial Submittal narrative will describe all delays occurring since Contract Award and all pending and anticipated "or equal" and substitution proposals. Payment and Revision Submittal narratives will describe any new delays and shall certify that the Contractor has not been delayed, as of the cut off date, by any acts or omissions of the County, except as otherwise specifically stated.

#### 1.09 ACTIVITY REQUIREMENTS

- A. Separate activities will identify permits, design when included in the Work, construction, Submittal preparation and review (and resubmission and re-review), deliveries (site or storage), testing, start-up, commissioning and Punch List.
- B. Activities will be detailed to the extent required to show the transition of trade Work. Activities will delineate the progression of the Work.
- C. Activities will not combine separate or non-concurrent items of Unit Price or lump sum Work.
- D. Activity durations will equal the Work Days required to sufficiently complete the Work designated by the Activity, (i.e., when finish-to-start successors could start, even if the Activity is not quite 100% complete). Installation Activities will last from 10 to 40 workdays. Submittal review activity durations shall conform to specified timeframes.
- E. Activities will be assigned consistent descriptions and identification codes. Sort codes will group Activities by meaningful schemes.
- F. Activities will be assigned Activity Values as appropriate and needed to reasonably allocate the Contract Amount to the time periods that they will be earned and eligible for payment based on the Progress Schedule and Schedule of Values. Separate pay activities may be used to simplify cost loading of the Progress Schedule. When used, pay activities shall be loaded with the cost of Work that is included, at no cost, in related (generally, concurrent) CPM activities. Pay activities shall not control the rate of progress; however, their start and finish dates shall be consistent with those of their related CPM activities to ensure accurate Early Date and Late Date cash-flow plots.

#### 1.10 FLOAT TOLERANCES AND FLOAT OWNERSHIP

- A. Any Progress Schedule with Early Dates after a Contract Time will yield negative Total and Contract Floats, whether shown/calculated or not. Any Revision Submittal with less than negative 20-days of Float will be returned as "Revise and Resubmit," unless a time extension is requested or the County assesses liquidated damages or gives notice of intent to do so, in the event schedule is not recovered.
- B. Float calculated from the definitions given in this Section supersede any conflicting Float values in any early completion Progress Schedule.

- C. Neither the County nor the Contractor own the Float time, the Project owns the Float time. Neither the County nor the Contractor use of positive Total Float will impact a Contract Completion Date or justify an extension of Contract Time.

#### 1.11 SUBMITTALS

- A. Each Progress Schedule Submittal will consist of a narrative, 5 copies of the required reports and plots and an optical ROM data disk with the Contractor's corresponding schedule and schedule layout files in Primavera ".XER" format.
- B. The County will review Progress Schedule Submittals and return a review copy within 14-days after receipt and the Contractor shall, if required, resubmit within 7-days after return of the review copy.
- C. Requirements for the Initial Submittal:
  - 1. Within 20-days after receipt of Notice to Proceed and prior to commencing Work on the Project, prepare and submit to the County the Initial Submittal of the Progress Schedule for the Work. The Initial Submittal will show the Work as awarded, without delays, Change Orders or substitutions.
    - a. Activity Values will prorate Schedule of Values costs and/or pay items through to Activities. Provide a cross-reference listing with two parts; a part that will list each activity with the respective amounts allocated from each Schedule of Values and Unit Price Item making up the total value of each activity and a second part that will list the Schedule of Values and Unit Price Items with the respective amounts allocated from each activity that make up the total value of each item.
  - 2. After the As-Planned Schedule is established, the County will select Milestones and record the Milestone Early and Late Dates. As the Official Schedule evolves, Milestone Dates will be revised accordingly.
  - 3. If the County refuses to endorse the Initial Submittal (or a resubmission) as "Resubmittal Not Required," the As-Planned Schedule will not be established. In that event, the Contractor will continue to submit Payment and Revision Submittals reflecting progress and the Contractor's approach to remaining Work. The County will rely on the available Payment and Revision Submittals, subject to whatever adjustments it determines appropriate.
- D. Requirements for Payment Submittals:
  - 1. Payment Submittals with progress up to the closing date and updated Early Dates and Late Dates for progress and remaining Activities will be due with each Progress Payment. As-built data will consist of actual dates, percent complete, earned payment, changes, Delays and other significant events occurring before the closing date.
  - 2. Activity percent complete and earned value should indicate a level of completion that corresponds to the Application for Progress Payment for the same period. The earned value should be calculated by the scheduling software as Activity Value times percent complete. Explanation should be provided whenever the cumulative earned value of activities in a Payment Submittal is not within 10% of the value of Work completed as represented in the corresponding Application for Progress for Payment.



3. At the Contractor's option, a Payment Submittal may overlay minor adjustments on activities and sequencing for Work remaining. This excludes Activity re-scoping to reflect Delays, changes, schedule recovery or substitutions.

E. Requirements for Revision Submittals:

1. Revision Submittals will be submitted when necessary because of major changes or delays affecting activities, sequencing or restraints for Work remaining and/or to put forth a schedule recovery plan. Revision Submittals may also be required because of Contractor-initiated re-planning, or when Contractor plans to perform Work ahead or out-of-sequence that will require additional testing or inspection personnel, or when requested by the County when Work is performed out-of-sequence from the current Official Schedule such that the number of Days gained or lost can not be determined or the scheduled dates of completion of the Work in a Payment Submittal are not viewed as reliable.
2. If requesting a time extension, the Revision Submittal should show the impact of the delay after incorporating reasonable mitigation to minimize the impact and illustrate how the number of Days requested time extension was determined. The delay should be determined as the change in the forecast Contract Completion Date(s) resulting solely from delays that entitle the Contractor to a time extension as provided in the General Conditions. Any and all Contractor slippage and delay occurring prior to and concurrent with the delay potentially entitling the Contractor to a time extension shall be incorporated in the Revision and explained such that the concurrent and non-concurrent periods of delay are indicated. If the Contractor does not follow the procedures contained in this Section or, if the Contractor's analysis is not verifiable by an independent, objective evaluation by the County using the electronic files and data furnished by the Contractor, any such extension in Contract Time will not be granted.

F. Retrospective Delay Analysis.

1. If the County/Professional refuses to endorse any Revision Submittal as "Resubmittal Not Required," the Contractor and County will use the latest Official Schedule when evaluating the effect of Delays on Contract Time and/or Contract Price. The procedure to be used will consist of progressively updating the latest Official Schedule at key closing dates corresponding to starting and finishing dates of the delays and/or dates the delays became critical or dates the Critical Path may have changed for other reasons. For each Progress Schedule iteration, slippage between actual Milestone Dates and Initial Milestone Dates will be correlated to Delays occurring solely in that iteration.
2. For each iteration, revisions in Activities, logic ties and restraints affecting Work after the closing date will be included in that Progress Schedule only if they meet any of the following conditions. First, they are Progress Schedule revisions that the County consented to contemporaneously (i.e., before the closing date) in writing. Second, they reflect comments or objections raised by or on behalf of the County and that were actually confirmed by the as-built progress. Lastly, they represent Contractor's schedule recovery plans or other Progress Schedule revisions that were actually confirmed by the as-built progress.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

END OF SECTION

**SECTION 01370**  
**SCHEDULE OF VALUES**

**PART 1 - GENERAL**

1.01 DEFINITION

- A. Schedule of Values: Schedule that divides the Contract Amount into pay items, such that the sum of all pay items equals the Contract Amount for the Work, or for any portion of the Work having a separate specified Contract Amount.

1.02 REQUIREMENT

- A. The Schedule of Values established as provided in the General Conditions will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to the County. Progress payments on account of Unit Price Work will be based on the number of units completed and shall be prorated by the percent complete on the number of units installed not meeting all requirements of the Contract including testing
- B. No payment will be made for Work performed on a lump sum contract or a lump sum item until the appropriate Schedule of Values is approved by the County.
- C. The equitable value of Work deleted from a lump sum contract or lump sum item shall be determined from the approved Schedule of Values.

1.03 SUBMITTALS

- A. Submit 3 copies of a Preliminary Schedule of Values within 15-days after the recommended award of the Contract.
- B. Submit 3 copies of a proposed final Schedule of Values within 20-days after receipt of Notice to Proceed as per the General Conditions.
- C. Submit the Schedule of Values, typed, on EJCDC 1910-8-E form or Orange County forms or spreadsheets provided by County. The Contractor's standard form or electronic media printout will be considered for acceptability by the County.
- D. List installed value of each major item of Work and each subcontracted item of Work as a separate line item to serve as a basis for computing values for Progress Payments. Round off values to nearest dollar.
- E. Coordinate listings with the Progress Schedule.
- F. For items on which payments will be requested for stored materials or equipment, list sub-values for cost of stored products with taxes paid and provide corresponding

schedule of value item number. Stored materials quantities shall not exceed installed quantities on bid tab or as required by the Contract Documents.

- G. The sum of values listed shall equal the total Contract Amount for the Work or the Contract Amount for a part of the Work with a separate Contract Amount provided for by the Contract Documents.
- H. When the County requires substantiating information, submit data justifying line item amounts in question.

#### 1.04 UNIT PRICE CONTRACTS

- A. Not Applicable to this project.

#### 1.05 LUMP SUM CONTRACTS

- A. The Contractor shall submit a complete Schedule of Values for approval prior to commencing construction. As a minimum, include those values reported on the following Schedule of Values Table. The Complete Schedule of Values shall be the basis for making payment applications and establishing prices for Change Orders.
- B. The Contractor shall provide information as requested by the Engineer to substantiate prices included in the Schedule of Values.
- C. The Schedule of Values shall be set up as two sub-projects; Filter one and Filter two.
- D. The total of all items shall be equal to the Bid Price.
- E. The attached schedule of values is intended to assist the Bidder in the preparation of their Complete Schedule of Values. The scope of work for this project as described in the contract documents includes but is not limited to the list of items on the attached Schedule of Values. In no case shall the Complete Schedule of Values contain fewer items than listed in the Table below.

**SCHEDULE OF VALUES**

**ORANGE COUNTY EASTERN WATER RECLAMATION FACILITY  
PHASE I/II AUTOMATIC BACKWASH FILTER REHABILITATION**

<b>Item No.</b>	<b>Description</b>	<b>TOTAL PRICE (FIGURES)</b>
<b>1</b>	Mobilization/Demobilization	
<b>2</b>	Indemnification	
<b>3</b>	Pre-construction Video	
<b>4</b>	<b>FILTER #1</b>	
<b>4.a.</b>	Demolition	
<b>4.b.</b>	Furnish & Install New Plates and Appurtenances	
<b>4.c.</b>	Caulk and Cure	
<b>4.d.</b>	Repair Damaged Cell Dividers	
<b>4.e.</b>	Replace Media	
<b>4.f.</b>	Repair Festoons and Cables	
<b>4.g.</b>	Furnish & Install Backwash Bridge and All Accessories	
<b>4.h.</b>	Furnish & Install New Control Panel	
<b>4.i.</b>	Furnish & Install Electrical Feed from MCC to Filter	
<b>4.j.</b>	All Other Items	
<b>5</b>	<b>FILTER #2</b>	
<b>5.a.</b>	Demolition	
<b>5.b.</b>	Furnish & Install New Plates and Appurtenances	
<b>5.c.</b>	Caulk and Cure	
<b>5.d.</b>	Repair Damaged Cell Dividers	
<b>5.e.</b>	Replace Media	
<b>5.f.</b>	Repair Festoons and Cables	
<b>5.g.</b>	Furnish & Install Backwash Bridge and All Accessories	
<b>5.h.</b>	Furnish & Install New Control Panel	

<b>5.i.</b>	Furnish & Install Electrical Feed from MCC to Filter	
<b>5.j.</b>	All Other Items	
<b>Total Base Bid Amount</b>		
<b>Alternate Additive Bid Item</b>		
<b>6(Alt)</b>	Provide the Additional Cost (per Fiberglass Divider) to Remove the Existing Defective Fiberglass Divider and to Furnish and Install a New Fiberglass Divider	
<b>Total Price (Figures)</b>		

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

END OF SECTION

**SECTION 01380**  
**AUDIO – VISUAL DOCUMENTATION**

**PART 1 - GENERAL**

1.01 PURPOSE AND DESCRIPTION OF WORK

- A. The purpose of the audio - visual documentation is to provide the County with regularly documented audio - visual records of the Construction process from the existing conditions through final completion.

1.02 PRE-CONSTRUCTION VIDEO REQUIREMENTS INCLUDED

- A. The Contractor shall employ a professional videographer to take a Pre-Construction video of the entire site including the areas of adjacent properties within 100-feet of the limits of Work and shall be made within 30-days of Work beginning. Special attention shall be made to show the existing paved roads, shoulders, signs, and other existing features.
- B. The Contractor shall submit a quality audio-video recording documenting Pre-Construction field conditions for the entire project. When the Work includes construction of water, wastewater, reuse, or other lines in the vicinity of any street or road, the Contractor shall take digital audio-video recordings of existing conditions along both sides of the street or road. The Pre-Construction video shall be submitted to the County and accepted prior to commencing any Work or using any Contractor laydown areas.
- C. Electronic digital photography shall also be used as necessary to record and facilitate resolution of on-site issues through the transmission of electronic photographs by e-mail from the site to the Professional's and County's offices.

**PART 2 - PRODUCTS**

2.01 AUDIO-VIDEO RECORDING

- A. Each audio-video recording shall be saved on appropriate DVD media viewable on standard DVD players or computer.

- B. Each DVD shall contain the following information and arrangement at the beginning as a title screen:
- Orange County, Florida
  - PROJECT NAME
  - PROJECT NUMBER
  - CONTRACTOR: (Name of Contractor)
  - DATE: (When photo was taken)
  - VIDEO BY: (Firm Name of Videographer)
  - LOCATION: (Description of Location(s) and View(s))
- C. Each DVD recording section shall begin with an audio description of the County's name, Contract name and number, Contractor's name, date and location information such as street name, direction of travel, viewing side, etc.
- D. Information appearing on the video recording must be continuous and run simultaneously by computer generated transparent digital information. No editing or overlaying of information at a later date will be acceptable.
- E. Digital information to appear in the upper left corner shall be as follows:
1. Name of Contractor
  2. Day, date and time
  3. Name of Project & Specification Number
- F. Time must be accurate and continuously displayed on the video record
- G. Written documentation must coincide with the information on the DVD so as to make easy retrieval of locations at a later date.
- H. The video system shall have the capability to transfer individual frames of video electronically into hard copy prints or photographic negatives.
- I. Audio shall be recorded at the same time as the video recording and shall have the same information as on the viewing screen. Special commentary shall be given for unusual conditions of buildings, sidewalks and curbing, foundations, trees and shrubbery, structures, equipment, pavement, etc.
- J. All DVDs and boxes shall bear labels with the following information:
1. DVD Number
  2. County's Name
  3. Date of Recording
  4. Project Name and Number
  5. Location and Standing Limit of Video

## 2.02 CONSTRUCTION PHOTOGRAPHS

- A. The Contractor shall employ a competent photographer to take construction record photographs periodically during the course of the Work.



- B. Prints: Date imprinted 8-inch x 10-inch high resolution glossy single weight color print paper; 5 sets, bound in 3-ring binders to be provided to the County with each respective Application for Payment and distributed by the County as follows:
1. County (2 sets)
  2. Engineer (1 set)
  3. Contractor (1 set)
  4. Project Record Data (1 set stored by Contractor to be furnished to County upon Closeout)

## **PART 3 - EXECUTION**

### **3.01 VIDEO VIEWS REQUIRED**

- A. Complete coverage shall include all surface features within 100-feet of the Work area to be used by the Contractor and shall be supported by appropriate audio description made simultaneously with video coverage. Such coverage shall include, but not be limited to, all existing driveways, sidewalks, curbs, ditches, roadways, landscaping, trees, culverts, headwalls, and retaining walls, equipment, structures, pavements, manholes, vaults, handrails, etc. located within the work zone. Video coverage shall extend to the maximum height of all structures within this zone.
- B. The video recorder shall take special efforts to point out and provide audio commentary on cracking, breakage, damage, and other defects in existing features.
- C. All video recording shall be done during times of good visibility. No video recording shall be done during periods of visible precipitation, or when more than 10% of the ground area is covered with standing water, unless otherwise authorized by County.
- D. Prior to commencement of audio-video recording, the Contractor shall notify the County in writing within 48-hours of the audio-video recording. The County may provide a designated representative to accompany and observe all video recording operations. Audio-video recording completed without a County Representative present will be unacceptable unless specifically authorized by the County.

### **3.02 AUDIO-VIDEO REQUIREMENTS**

- A. Major Locations:
1. The Contractor shall provide color digital video of each major facility and structures and facilities adjacent to the Construction before construction starts.
  2. All videos shall be recorded with character generator operating with date, time, and location on screen. During video recording, the Contractor shall narrate video explaining what is being shown. All master videos shall be delivered to the County.

3. The audio and video portions of the recording shall maintain viewer orientation. To this end, overall establishing views of all visible house and business addresses shall be used. In areas where the proposed construction location will not be readily apparent to the video recording viewer, highly visible yellow flags shall be placed, by the Contractor, in such a fashion as to clearly indicate the proposed centerline of Construction. When conventional wheeled vehicles are used as conveyances for the recording system, the vertical distance between the camera lens and the ground shall not exceed 10-feet. The camera shall be firmly mounted such that transport of the camera during the recording process will not cause an unsteady picture.
4. All video recording shall be done during time of good visibility. No video recording shall be done during precipitation, mist or fog. The recording shall only be done when sufficient sunlight is present to properly illuminate the subjects of recording and to produce bright, sharp video recordings of those subjects.
5. The average rate of travel during a particular segment of coverage shall be directly proportional to the number, size and value of the surface features within that construction area's zone of influence. The rate of speed in the general direction of travel of the vehicle used during taping shall not exceed 44-feet per minute.

### 3.03 PHOTOGRAPHS

- A. A minimum of 3 views (top, upstream, and downstream) each shall generally be taken prior to backfilling pipelines or structures. Photographs shall be provided for:
  1. Utility conflicts/relocations
  2. Manholes
  3. Pump stations
  4. Boring and jacking
  5. Directional drilling pipe entrance and exit
  6. Valve installation
  7. Air release valve installation
  8. Fire hydrant assembly
- B. Photo Identification
  1. Name of Project
  2. Name of Structure
  3. Orientation of View
  4. Date & Time of Exposure
  5. Film numbered identification of exposure

END OF SECTION

**SECTION 01400**  
**QUALITY CONTROL**

**PART 1 - GENERAL**

1.01 SITE INVESTIGATION AND CONTROL

- A. Contractor shall verify all dimensions in the field and check field conditions continuously during construction. Contractor shall be solely responsible for any inaccuracies built into the Work due to Contractor's failure to comply with this requirement.
- B. Contractor shall inspect related and appurtenant Work and report in writing to County any conditions which will prevent proper completion of the Work. Failure to report any such conditions shall constitute acceptance of all site conditions, and any required removal, repair, or replacement caused by unsuitable conditions shall be performed by the Contractor at Contractor's sole cost and expense.

1.02 INSPECTION OF THE WORK

- A. The Work shall be conducted under the general observation of representatives of the County acting on behalf of the County to ensure strict compliance with the requirements of the Contract Documents. Such inspection may include mill, plant, shop, or field inspection, as required. The County shall be permitted access to all parts of the Work, including plants where materials or equipment are manufactured or fabricated. Inspection by the County are in addition to the inspections required of Contractor by his QC Representatives.
- B. The presence of the County, however, shall not relieve the Contractor of the responsibility for the proper execution of the Work in accordance with all requirements of the Contract Documents. Compliance is a duty of the Contractor, and said duty shall not be avoided by any act or omission on the part of the County. Further, no requirement of this Contract may be waived or modified except by change order or formal (written) substitution approval.
- C. All materials and articles furnished by the Contractor shall be subject to rigid inspection, and no materials or articles shall be used in the Work until they have been inspected and accepted by the County. No Work shall be backfilled, buried, cast in concrete, hidden, or otherwise covered until it has been inspected. Any Work so covered in the absence of inspection shall be subject to uncovering. Where uninspected Work cannot be uncovered, such as in concrete cast over reinforcing steel, all such Work shall be subject to demolition, removal, and reconstruction under proper inspection and no additional payment will be allowed therefore.

- D. The Contractor is responsible for the Quality of his own work and shall designate a qualified individual, to be approved by the County, who will ensure that all work is performed in strict accordance with the Contract Documents. This quality representative shall inspect the work for the Contractor and provide to the County and the Contractor a report outlining all work accomplished, all inspections, and all testing performed for all days when work is performed. The objective of this report is to provide "Objective Evidence of Compliance" by the Contractor with the requirements of the Contract.

#### 1.03 TIME OF INSPECTION AND TESTS

- A. Samples and testing required under these Specifications shall be furnished and prepared in ample time for the completion of the necessary tests and analyses before said articles or materials are to be used. Except as otherwise provided in the Contract Documents, performance of the required tests will be by the Contractor and all costs therefore will be borne by the Contractor at no cost to the County. Whenever the Contractor is ready to backfill, bury, cast in concrete, hide, or otherwise cover any Work under this Contract, the County shall be notified not less than 24-hours in advance to request inspection before beginning any such Work of covering. Failure of the Contractor to notify the County at least 24-hours in advance of any such inspections shall be reasonable cause for the County to order a sufficient delay in the Contractor's schedule to allow time for such inspection, any remedial, or corrective work required, and all costs of such delays, including its impact on other portions of the Work, shall be borne by the Contractor.

#### 1.04 SAMPLING AND TESTING

- A. When not otherwise specified, all sampling and testing shall be in accordance with the methods prescribed in the current standards of the ASTM, as applicable to the class and nature of the article or materials considered. However, the County reserves the right to use any generally accepted system of inspection which, in the opinion of the County, will ensure the County that the quality of the workmanship is in full accord with the Contract Documents.
- B. Any waiver of any specific testing or other quality assurance measures, whether or not such waiver is accompanied by a guarantee of substantial performance as a relief from the specified testing or other quality assurance requirements as originally specified, and whether or not such guarantee is accompanied by a performance bond to assure execution of any necessary corrective or remedial work, shall not be construed as a waiver of any technical or qualitative requirements of the Contract Documents.
- C. Notwithstanding the existence of such waiver, the County shall reserve the right to make independent investigations and tests as specified in the following paragraph and, upon failure of any portion of the Work to meet any of the qualitative requirements of the Contract Documents, shall be reasonable cause for the County to require the removal or correction and reconstruction of any such Work.

- D. In addition to any other inspection or quality assurance provisions that may be specified, the County shall have the right to independently select, test, and analyze, at the expense of the County, additional test specimens of any or all of the materials to be used. Results of such tests and analyses shall be considered along with the tests or analyses made by the Contractor to determine compliance with the applicable specifications for the materials so tested or analyzed provided that wherever any portion of the Work is discovered, as a result of such independent testing or investigation by the County which fails to meet the requirements of the Contract Documents, all costs of such independent inspection and investigation and all costs of removal, correction, reconstruction, or repair of any such Work shall be borne by the Contractor.

#### 1.05 RIGHT OF REJECTION

- A. The County shall have the right at all times and places to reject any articles or materials to be furnished hereunder which, in any respect, fail to meet the requirements of the Contract Documents, regardless of whether the defects in such articles or materials are detected at the point of manufacture or after completion of the Work at the site. If the County or inspector, through an oversight or otherwise, has accepted materials or Work which is defective or which is contrary to the Contract Documents, such material, no matter in what stage or condition of manufacture, delivery, or erection, may be rejected by County.
- B. Contractor shall promptly remove rejected articles or materials from the site of the Work after notification or rejection.
- C. All costs of removal and replacement of rejected articles or materials, as specified herein, shall be borne by the Contractor.
- D. If the Contractor fails to remove or replace defective work after notification to do so, the County may have the work removed and replaced by others and deduct all costs from the Contractor's pay requests.

#### 1.06 TESTING LABS

- A. All geotechnical testing laboratory services for field testing will be paid by the County. The lab(s) shall function as independent lab(s) and report independently to the County and the Contractor. The test lab(s) may not approve or allow any deviation from the Contract Documents.

### **PART 2 - PRODUCTS (NOT USED)**

### **PART 3 - EXECUTION (NOT USED)**

END OF SECTION

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## SECTION 01415

### STORMWATER POLLUTION PREVENTION / NPDES REQUIREMENTS

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

Stormwater Pollution Prevention Plan requirements and recommendations under the NPDES program for construction projects located in Florida.

##### 1.02 PURPOSE

The purpose of this section is to outline minimum requirements for storm water pollution prevention as required under the NPDES program.

##### 1.03 RELATED SECTIONS

- A. Section 01560 – Erosion and Sediment Control

##### 1.04 ABBREVIATIONS

- A. NPDES - National Pollution Discharge Elimination System
- B. SWPPP - Stormwater Pollution Prevention Plan
- C. NOI - Notice of Intent
- D. NOT - Notice of Termination

##### 1.05 DEFINITIONS

The term “NPDES Generic Permit” means the State of Florida Department of Environmental Protection (FDEP) Generic Permit For Stormwater Discharge from Large and Small Construction Activities.

##### 1.06 CONSTRUCTION PROJECTS REQUIRING COMPLIANCE WITH NPDES GENERIC PERMIT

- A. All projects 1 or more acres in size that discharge to offsite areas.
- B. Smaller projects that are in the same construction corridor as larger construction projects where the larger project is 1 or more acre in size and is required to comply with the NPDES Generic Permit. In this case, even if the smaller project is less than 1 acre in size, the smaller project must comply with the NPDES Generic Permit.

## 1.07 GENERAL REQUIREMENTS

- A. Construction of this project is required to comply with the requirements of the National Pollutant Discharge Elimination System (NPDES) Generic Permit for Stormwater Discharge from Small and Large Construction Activities.
- B. In order to meet NPDES requirements, the Contractor is responsible for preparing a Stormwater Pollution Prevention Plan (SWPPP), implementing, inspecting, maintaining, and reporting on all elements of the SWPPP, completing and submitting the required Notice of Intent (NOI) and Notice of Termination (NOT) forms as the Operator, and paying all associated fees. Copies of the NPDES Generic Permit, NOI, and NOT forms, and permit application fee information are available for download at [dep.state.fl.us/water/stormwater/npdes/](http://dep.state.fl.us/water/stormwater/npdes/)
- C. The Contractor must include in the SWPPP the names and addresses of all subcontractors working on this project who will be involved with the major construction activities that disturb site soil or who implement a pollutant control measure. These subcontractors, in addition to the Contractor, shall comply with the requirements of the NPDES Generic Permit and any local governing agency having jurisdiction concerning erosion and sedimentation control, and shall sign a copy of the certification statement in the SWPPP.
- D. The SWPPP shall describe and ensure the implementation of best management practices which will be used to reduce the pollutants in stormwater discharge associated with construction activity and to assure compliance with the terms and conditions of the NPDES Generic Permit. The erosion and sediment control measures shown on these Drawings are the minimum required and are to be installed prior to construction. The Contractor is responsible for complying with all applicable rules, regulations and water quality standards and may need to install additional controls to meet these requirements.

## 1.08 SWPPP IMPLEMENTATION AND SUBMITTAL REQUIREMENTS

- A. The SWPPP shall be completed prior to submittal of the NOI and shall include the elements necessary to comply with the NPDES Generic Permit for construction activities administered by the FDEP and shall also include all local governing agency and Owner requirements. There may be more stringent local government or Owner requirements for Erosion and Sediment Control, which would be located in the Specifications or on the Drawings. The more stringent requirement governs.
- B. The Contractor must file the NOI with FDEP and the Owner at least two (2) business days prior to the start of construction. The Contractor shall also submit a copy of the NOI to the MS4 operator for all projects that discharge stormwater associated with construction activity to a municipal separate stormwater system (MS4). A copy of the NOI and a description of the project must be posted in a prominent place for public viewing at the construction site.
- C. The SWPPP must be implemented at the start of construction. A complete copy of the SWPPP, including copies of all inspection reports, plan revisions, etc., must be retained



at the project site at all times during working hours and kept in the permanent project records for at least three years following submission of the NOT.

- D. Final Stabilization means that all soil disturbing activities at the site have been completed, and that a uniform perennial vegetative cover (evenly distributed, without large bare areas) with a density of at least 70% for all unpaved areas and areas not covered by permanent structures has been established or equivalent permanent stabilization measures (such as geotextiles) have been employed. Once construction is completed and final stabilization has been achieved, the Contractor must file the NOT to FDEP, the Owner, and the MS4 operator within 14 days.

#### 1.09 INSPECTIONS

- A. It is the responsibility of the Contractor to assure the adequacy of site pollutant discharge controls. Between the time the SWPPP is implemented and final site stabilization is achieved, all disturbed areas and pollutant controls must be inspected at least once every seven calendar days and within 24 hours following a rainfall of 0.5 inches or greater. The inspections are to be conducted by the Contractor's qualified designated representative.
- B. All inspections shall be documented in an inspection report that summarizes the scope of the inspection, the names and qualifications of personnel making the inspection; the date of the inspection; rainfall data; major observations relating to the implementation of the SWPPP, and actions taken in order to ensure compliance with NPDES requirements and the SWPPP. Such reports shall identify any incidents of non-compliance and actions taken to bring the project into compliance. Where a report does not identify any incidents of non-compliance, the report shall contain a certification that the facility is in compliance with the NPDES requirements and the SWPPP. Each inspection report shall be signed and certified by each inspector.

#### 1.10 UPDATING AND MODIFYING THE SWPPP

- A. Based on inspection results, any modifications necessary to increase effectiveness of the SWPPP to an acceptable level must be made within seven calendar days of the inspection.
- B. The SWPPP must be updated each time there are significant modifications to the pollutant prevention system or a change of contractors working on the project who disturbs site soil. For construction activities where the operator changes, the new operator shall file an NOI for coverage under this permit at least two (2) days before assuming control of the project and the previous operator shall file an NOT to terminate permit coverage in accordance with the NPDES Generic Permit. Amendments to the plan shall be prepared, signed, dated, and kept as attachments to the original SWPPP.

#### 1.11 MINIMUM SWPPP PROVISIONS

- A. Each SWPPP shall provide a description of pollutant sources and other information including a description of the nature of the construction activity; the intended sequence of

major activities which disturb soils for major portions of the site; estimates of the total area of the site and the total area of the site that is expected to be disturbed by excavation, grading, or other construction activities; existing data describing the soil or the quality of any discharge from the site and an estimate of the size of the drainage area for each discharge point; a site map indicating drainage patterns and approximate slopes anticipated after major grading activities, areas of soil disturbance, an outline of areas which may not be disturbed, the location of major structural and nonstructural controls identified in the plan, the location of areas where stabilization practices are expected to occur, surface waters, wetlands, and locations where stormwater is discharged to a surface water or MS4; and the latitude and longitude of each discharge point and the name of the receiving water(s) for each discharge point.

#### 1.12 MINIMUM EROSION AND SEDIMENT CONTROL CONSTRUCTION REQUIREMENTS

- A. Stabilize all construction site exits with coarse aggregate or other approved materials, in accordance with details on the Drawings. Other minimum construction requirements that need to be implemented in order to comply with the NPDES Generic permit include installation of sediment barriers down slope from construction activities that disturb site soil; constructing rock surface temporary parking areas; installation of sediment barriers down slope prior to clearing and grubbing; installation of sediment barriers on the down slope side of utility construction and soil stockpiles; and the installation of sediment barriers on the down slope side of grading activities.
- B. Stabilization measures shall be initiated as soon as practicable, but in no case more than 7 days, in portions of the site where construction activities have temporarily or permanently ceased.
- C. The Owner has the authority to limit surface area of erodible earth material exposed by clearing and grubbing, excavation, trenching, borrow and embankment operations. The Owner also has authority to direct Contractor to provide immediate permanent or temporary erosion and sediment control measures.
- D. The Contractor shall respond to erosion and sediment control maintenance requirements or implement additional measures to control erosion ordered by Owner or governing authorities within 48 hours or sooner if required at no additional cost to the Owner.
- E. The Contractor shall incorporate permanent erosion control features into project at earliest practical time to minimize need for temporary controls.
- F. For drainage basins with 10 or more disturbed acres at one time, a temporary (or permanent) sediment basin providing 3,600 cubic feet of storage per acre drained, or equivalent control measures, shall be provided where attainable until final stabilization of the site. The 3,600 cubic feet of storage area per acre drained does not apply to flows from offsite areas and flows from onsite areas that are either undisturbed or have undergone final stabilization where such flows are diverted around both the disturbed area and the sediment basin. For drainage basins with 10 or more disturbed acres at one

time and where a temporary sediment basin providing 3,600 cubic feet of storage per acre drained, or equivalent controls is not attainable, a combination of smaller sediment basins and/or sediment traps and other BMPs should be used. At a minimum, silt fences, or equivalent sediment controls are required for all sideslope and downslope boundaries of the construction area.

- G. Water trucks shall be used as needed during construction to reduce dust generated on the site. Dust control must be provided by the Contractor and shall be in compliance with applicable local and state dust control regulations.

#### 1.13 MAINTENANCE REQUIREMENTS

- A. Maintain all erosion and sediment control measures throughout construction. Repair or replace all damaged sediment barriers. Remove accumulated sediment along all silt fences where the height of the sediment exceeds one-third of the height of the silt fence. Inspect all temporary and permanent grassing areas and re-grass where there are bare spots, washouts, or unhealthy growth.
- B. At the completion of construction, once final stabilization has been achieved, clean all accumulated sediment from all storm structures, pipelines, and stormwater ponds. Remove all temporary sediment controls upon receipt of authorization to remove has been received from the Owner or Engineer. Note that this may not occur for some time after construction activities have been completed, in order to ensure their removal has not occurred until final stabilization has been achieved to the satisfaction of the Owner and Engineer.

#### 1.14 STORMWATER DISCHARGE PROVISIONS

- A. Non-stormwater components of site discharge must be clean water. Water used for construction, which discharges from the site, must originate from a public water supply or private well approved by the governing local agency. Water used for construction that does not originate from an approved public supply must not discharge from the site. Allowable non-stormwater discharges include discharges from firefighting activities; Fire hydrant flushing; Water used to wash vehicles or control dust; Water flowing from potable sources and water line flushing; Irrigation drainage; and runoff from pavement wash down where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents have not been used.
- B. Solid materials, including building materials, are not allowed to be discharged from the site with stormwater. All solid waste, including disposable materials incidental to the major construction activities, must be collected and placed in containers. The containers shall be emptied periodically by a contract trash disposal service and hauled away from the site.
- C. Substances that have the potential for polluting surface and/or groundwater must be controlled by whatever means necessary in order to ensure that they do not discharge from the site. As an example, special care must be exercised during equipment fueling

and servicing operations. If a spill occurs, it must be contained and disposed so that it will not flow from the site or enter groundwater, even if this requires removal, treatment, and disposal of soil in accordance with local and state regulations.

- D. All personnel involved with construction activities must comply with state and local sanitary or septic system regulations. Temporary sanitary facilities shall be provided at the site throughout the construction phase. They must be utilized by all construction personnel and shall be serviced by a commercial operator.
- E. Discharges resulting from groundwater dewatering activities at construction sites are permitted provided the groundwater is free of sediments, is not contaminated, and dewatering occurs in accordance with state and local governing agency regulations.
- F. Chemicals, paints, solvents, fertilizers, and other toxic material must be stored in waterproof containers. Except during application, the contents must be kept in trucks or within storage facilities. Runoff containing such material must be collected, removed from the site, treated, and disposed at an approved solid waste or chemical disposal facility.
- G. The discharge of hazardous substances or oil in the stormwater discharge(s) from a facility or activity shall be prevented. This does not relieve the operator of the reporting requirements of 40 CFR part 117 and 40 CFR part 302. The operator shall submit within 14 calendar days of knowledge of the release a written description of: the release (including the type and estimate of the amount of material released), the date that such release occurred, the circumstances leading to the release, and remedial steps to be taken. The SWPPP must be modified within 14 calendar days of knowledge of the release to: provide a description of the release, the circumstances leading to the release, and the date of the release. In addition, the plan must be reviewed to identify measures to prevent the reoccurrence of such releases and to respond to such releases, and the plan must be modified where appropriate.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

END OF SECTION

**SECTION 01516**  
**FILTER SYSTEM BYPASS**

**PART 1 - GENERAL**

1.01 SCOPE OF WORK

- A. The Work covered by this section consists of providing all temporary bypassing to perform all operations in connection with the flow of wastewater around the existing Automatic Backwash (ABW) Phase I/II filters. The purpose of bypassing is to prevent wastewater overflows. The County shall provide a temporary disk filter and concrete pad to process wastewater flow while each Phase of the ABW filters is being worked on. When the influent channel level rises to a County provided set point, the filter system bypass shall turn on to maintain water levels below the set point.

1.02 SUBMITTALS

- A. Prior to implementation of any bypass, the Contractor shall submit and receive County acceptance of a bypass plan. The Contractor shall submit to the County a comprehensive written plan for approval and acceptance that describes the intended bypass for the maintenance of flows during construction. The Contractor shall also provide a sketch showing the location of bypass pumping equipment for each filter around which flows are being bypassed. The plan shall include proposed pump(s), bypass piping, backup plan and equipment, work schedule, monitoring log for bypass pumping and monitoring plan of the bypass pumping operation.

**PART 2 - PRODUCTS**

2.01 GENERAL

- A. The Contractor shall provide and maintain adequate equipment, piping, tankers, and other necessary appurtenances in order to maintain continuous and reliable wastewater service in all wastewater lines as required for construction. The Contractor shall have backup pump(s), piping, and appurtenances ready to deploy immediately.
- B. All piping shall be designed to withstand at least twice the maximum system pressure or a minimum of 50-psi, whichever is greater. Piping into the suction and discharge of the pumping equipment and the disk filter shall be rigid. Contractor shall provide temporary influent piping from the pumps to the temporary disk filter and effluent piping from the temporary disk filter to the filter effluent channel or the chlorine contact chamber. Piping shall be sized to handle a maximum flow rate of 5 MGD.
- C. Contractor shall provide variable speed pumps that can be placed in the filter influent channel, using the channel as a “wet well”. The pump system shall be capable of

pumping 700 gpm@20 feet of head thru 3500 gpm@30 feet of head.

- D. When bypassing a filter, one (1) back-up pump equal to the primary unit shall be provided by the Contractor. Bypass pumps shall have a maximum rating of 55 decibels for sound attenuation.

### **PART 3 - EXECUTION**

#### **3.01 GENERAL**

- A. The Contractor shall have all materials, equipment and labor necessary to complete the repair, replacement, or rehabilitation on the job site prior to isolating the ABW filters. The Contractor shall demonstrate that the temporary bypass pumping system is in good working order and is sufficiently sized to successfully handle flows by performing a test run for a period of 24-hours prior to beginning the Work.

#### **3.02 TRAFFIC CONSIDERATIONS**

- A. The Contractor shall locate bypass pumping suction and discharge lines so as to not cause undue interference with the use of sidewalks.

#### **3.03 BYPASS OPERATION**

- A. The Contractor shall submit a bypass plan to the County and the bypass plan must be approved before the bypass is operational to perform the Work. Contractor shall maintain the wastewater system flow and no surcharging shall be allowed to occur out of the system.
- B. The Contractor shall be responsible for monitoring the bypass operation 24-hours per day, 7-days per week. Any electronic monitoring in lieu of on-site monitoring must be detailed in the comprehensive written bypass plan. The County shall pay for all fuel costs of the bypass pumps. All maintenance of the temporary pumps shall be provided by the Contractor.
- C. The Contractor shall ensure that no damage will be caused to private property as a result of bypass pumping operations. The Contractor shall complete the Work as quickly as possible and pass all tests and inspections before discontinuing bypassing operations and returning flow to the ABW filters.
- D. During bypassing, no wastewater shall be leaked, dumped, or spilled in or onto, any area outside of the existing wastewater system.
- E. The Contractor shall immediately notify the County should an overflow occur. The Contractor shall take the necessary action to wash down, clean up and disinfect the spillage area to the satisfaction of the County or other governmental agency.
- F. The Contractor shall cease bypass operations and return flows to the newly refurbished

filter when directed by the County. When bypass operations are complete, all bypass piping shall be drained into the wastewater system prior to disassembly.

#### 3.04 CONTRACTOR LIABILITY

- A. The Contractor shall be responsible for all required pumping, equipment, piping, and appurtenances to accomplish the bypass and for any and all damage that results directly or indirectly from the bypass pumping equipment, piping and/or appurtenances. The Contractor shall also be liable for all County personnel labor and equipment costs, penalties and fines resulting from any overflows. It is the intent of these specifications to require the Contractor to establish adequate bypass pumping as required regardless of the flow condition.

END OF SECTION

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**SECTION 01560**  
**EROSION AND SEDIMENTATION CONTROL**

**PART 1 - GENERAL**

1.01 WORK INCLUDED

- A. The Work specified in this Section consists of designing, providing, maintaining and removing temporary erosion and sedimentation controls as necessary to protect the Work and prevent sedimentation from the Contractor's activities from entering water bodies or enter other parts of the County's or other property owners sites outside the Construction limits.
- B. Temporary erosion controls include, but are not limited to; grassing, mulching, netting, watering and reseeded on-site surfaces and soil and borrow area surfaces, and providing interceptor ditches at end of berms and at those locations which will ensure that erosion during Construction will be either eliminated or maintained within acceptable limits as established by the regulatory agencies having jurisdiction.
- C. Temporary sedimentation controls include, but are not limited to; silt dams, traps, barriers, and appurtenances at the foot of sloped surfaces which will ensure that sedimentation pollution will be either eliminated or maintained within acceptable limits as established by the regulatory agencies having jurisdiction.

1.02 REQUIREMENTS

- A. The Contractor is responsible for providing effective temporary erosion and sediment control measures during Construction or until final controls become effective.
- B. The Contractor shall be responsible for filing Notice of Intent for Construction Activities with regulatory agencies (SJRWMD, SFWMD, and FDEP) as required by law, if thresholds are expected to be exceeded.
- C. The areas of unstabilized soil cover shall be minimized at all times to limit erosion and sedimentation.

1.03 SUBMITTALS:

- A. The Contractor shall prepare and submit an Erosion and Sedimentation Control Plan (Stormwater Pollution Prevention Plan) for County review and approval. The Plan shall be in effect throughout the Construction duration.

## **PART 2 - PRODUCTS**

### **2.01 EROSION CONTROL**

- A. Seed: Scarified Argentine Bahia.
- B. Sod: Bermuda grass, Argentine Bahia grass, Pensacola Bahia grass or St. Augustine. Grassing and Sodding Materials: As specified in Section 981 FDOT Specification for Road & Bridge Construction.
- C. Netting: Polypropylene mesh netting 5/8-inch x 3/4-inch (16 x 19mm) mesh with interwoven curllex fibers as manufactured by American Excelsior Company or equal. Netting: Fabricated of material in conformance with Section 985 FDOT Specification for Road & Bridge Construction.

### **2.02 SEDIMENTATION CONTROL**

- A. Bales: Clean, synthetic hay type. Minimum dimensions of 14-inch by 18-inch by 36-inches at the time of placement.
- B. Netting: Fabricated of material in conformance with Section 985 FDOT Specification for Road & Bridge Construction.
- C. Sediment Control Fencing (Silt Fencing): As manufactured by American Excelsior Company or equal.
- D. Filter stone: Crushed stone conforming to Florida Department of Transportation Specifications.
- E. Concrete block: Hollow, non-load bearing type.
- F. Concrete: Exterior grade not less than 1-inch thick.
- G. Turbidity Barriers: Floating or staked as required.

## **PART 3 - EXECUTION**

### **3.01 TEMPORARY EROSION CONTROL**

- A. See Section 02578 "Solid Sodding."

### **3.02 SEDIMENTATION CONTROL**

- A. Install and maintain silt fences and dams, traps, barriers, and appurtenances as shown on the approved descriptions and working Drawings. Replace deteriorated hay bales and dislodged filter stone. Repair portions of any devices damaged at no additional expense to the County.

- B. Install all sediment control devices in a timely manner to ensure the control of sediment. At sites where exposure to sensitive areas is likely, complete installation of all sediment control devices before starting earthwork.
- C. Use approved temporary erosion control features to correct conditions that develop during Construction that were not foreseen when the Erosion and Sedimentation Control Plan was first approved.

### 3.03 PERFORMANCE

- A. Should any of the temporary erosion and sediment control measures employed by the Contractor fail to produce results that comply with the requirements of the Regulatory agency having jurisdiction, the County or the Professional, the Contractor shall immediately take whatever steps necessary to correct the deficiency at its own expense to protect the Work and any adjacent property to the site, as well as to prevent contamination of any river, stream, lake, tidal waters, reservoir, canal or other water impoundments.
- B. The side slope areas with unstabilized or unprotected soil cover shall be minimized at all times to limit erosion and sedimentation.
- C. Incorporate permanent erosion control features into the Project at the earliest practical time.
- D. Remove temporary erosion and sedimentation controls when the Work is complete and in accordance with the Erosion and Sedimentation Control Plan (Stormwater Pollution Prevention Plan) and the Notice of Intent for Construction Activities filed with regulatory agencies.

### 3.04 MAINTENANCE OF EROSION AND CONTROL FEATURES

- A. Provide routine maintenance of permanent and temporary erosion control features, at no expense to the County, until the Project is complete and accepted.

END OF SECTION

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**SECTION 01610**  
**DELIVERY, STORAGE AND HANDLING**

**PART 1 - GENERAL**

1.01 DESCRIPTION

- A. This Section specifies the general requirements for the delivery, handling, storage and protection for all items required in the construction of the Work.
- B. Deliver, handle and store products in accordance with manufacturer's recommendations and by methods and means that will prevent damage, deterioration, and loss including theft and protect against damage from climatic conditions. Control delivery schedules to minimize long-term storage of products at the site and overcrowding of construction spaces. In particular, provide delivery/installation coordination to ensure minimum holding or storage times for products recognized to be flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other sources of loss. Damaged or defective items, in the opinion of the County, will be replaced at no cost to the County.

1.02 REQUIREMENTS

- A. The Contractor is responsible for all material, equipment and supplies sold and delivered to the County under this Contract until final inspection of the Work and acceptance thereof by the County.
- B. All materials and equipment to be incorporated in the Work will be handled and stored by the Contractor before, during and after shipment in a manner to prevent warping, twisting, bending, breaking, chipping, rusting, and any injury, theft or damage of any kind whatsoever to the material or equipment.
- C. All materials and equipment, which in the opinion of the County, have become so damaged as to be unfit for the use intended or specified, will be promptly removed from the site of the Work, and the Contractor will receive no compensation for the damaged materials or equipment or for its removal.
- D. In the event any such material, equipment and supplies are lost, stolen, damaged or destroyed prior to final inspection and acceptance, the Contractor will replace same without additional cost to the County.

1.03 DELIVERY

- A. Transport and handle items in accordance with manufacturer's instructions.

- B. The County and the Contractor's project superintendent must be on-site to accept all deliveries shipped directly to the job site. If the project superintendent is not present for a delivery, that delivery may be rejected by the County. If any delivery is rejected due to non-availability of the Contractor's project superintendent, delivery shall be rescheduled at no additional cost to the County.
- C. Schedule delivery to reduce long-term on-site storage prior to installation and/or operation. Under no circumstances will materials or equipment be delivered to the site more than 1-month prior to installation without written authorization from the County.
- D. Coordinate deliveries in order to avoid delay in, or impediment of, the progress of the Work.
- E. Coordinate delivery with installation to ensure minimum holding time for items that are hazardous, flammable, easily damaged or sensitive to deterioration.
- F. All items delivered to the site will be unloaded and placed in a manner that will not hamper the Contractor's normal construction operation or those of Subcontractors and other Contractors and will not interfere with the flow of necessary traffic.
- G. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible. Maintain packaged materials with seals unbroken and labels intact until time of use.
- H. Immediately on delivery, inspect shipments with the County to ensure compliance with requirements of Contract Documents and accepted submittals, and that products are properly protected and undamaged. If the Contractor does not notify the County regarding the delivery and the County rejects any part of the delivery, there will be no additional cost to the County for the material to be returned. For items furnished by others (i.e. County), perform inspection in the presence of the County. Provide written notification to the County of any problems.
- I. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the County.

#### 1.04 STORAGE AND HANDLING

- A. Provide equipment and personnel to handle products by methods recommended by the manufacturer to prevent soiling or damage to products or packaging, with seals and labels intact and legible.
- B. The Contractor is responsible for securing a location for on-site storage of all material and equipment necessary for completion of the Work. The location and storage layout will be submitted to the County at the Pre-Construction conference.
- C. Manufacturer's storage instructions will be carefully studied by the Contractor and reviewed with the County. These instructions will be carefully followed and a written

record of this kept by the Contractor.

- D. All material delivered to the job site will be protected from dirt, dust, dampness, water, and any other condition detrimental to the life of the material from the date of delivery to the time of installation of the material and acceptance by the County.
- E. When required or recommended by the manufacturer, the Contractor will furnish a covered, weather protected storage structure providing a clean, dry, non-corrosive environment for all mechanical equipment valves, architectural items, electrical and instrumentation equipment, and special equipment to be incorporated into this Project.
- F. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions and free from damage or deterioration.
- G. Should the Contractor fail to take proper action on storage and handling of equipment supplied under this Contract within 7-days after written notice to do so has been given, the County retains the right to correct all deficiencies noted in previously transmitted written notice and deduct the cost associated with these corrections from the Contract Amount. These costs may be comprised of expenditures for labor, equipment usage, administrative, clerical, engineering, and any other costs associated with making the necessary corrections.

#### 1.05 SPECIFIC STORAGE AND HANDLING

(Additional specific storage and handling requirements may be found in the specification sections addressing the material requirements.)

- A. All mechanical and electrical equipment and instruments subject to corrosive damage by the atmosphere if stored outdoors (even though covered by canvas) will be stored in a weather tight building to prevent damage. The building may be a temporary structure on the site or elsewhere, but it must be satisfactory to the County. The building will be provided with adequate ventilation to prevent condensation. Maintain temperature and humidity within range required by manufacturer.
  - 1. All equipment will be stored fully lubricated with oil, grease and other lubricants unless otherwise instructed by the manufacturer. Mechanical equipment to be used in the Work, if stored for longer than 90-days, will have the bearings cleaned, flushed and lubricated prior to testing and startup, at no extra cost to the County.
  - 2. Moving parts will be rotated a minimum of once weekly to ensure proper lubrication and to avoid metal-to-metal "welding." Upon installation of the equipment, the Contractor will start the equipment, at least half load, once weekly for an adequate period of time to ensure that the equipment does not deteriorate from lack of use.

3. Lubricants will be changed upon completion of installation and as frequently as required thereafter during the period between installation and acceptance. New lubricants will be put into the equipment at the time of acceptance. Prior to acceptance of the equipment, the Contractor will have the manufacturer inspect the equipment and certify that its condition has not been detrimentally affected by the long storage period. Such certifications by the manufacturer will be deemed to mean that the equipment is judged by the manufacturer to be in a condition equal to that of equipment that has been shipped, installed, tested and accepted in a minimum time period. As such, the manufacturer will guaranty the equipment equally in both instances. If such a certification is not given, the equipment will be judged to be defective. It will be removed and replaced at the Contractor's expense.
  4. Electric motors provided with heaters will be temporarily wired for continuous heating during storage. Upon installation of the equipment, the Contractor will start the equipment, at least half load, and once weekly for an adequate period of time to insure that the equipment does not deteriorate from lack of use.
- B. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
  - C. Cement and lime will be stored under a roof and off the ground and will be kept completely dry at all times.
  - D. Brick, block and similar masonry products will be handled and stored in a manner to minimize breakage, chipping, cracking and spilling to a minimum.
  - E. Precast Concrete will be handled and stored in a manner to prevent accumulations of dirt, standing water, staining, chipping or cracking.
  - F. All structural and miscellaneous steel and reinforcing steel will be stored off the ground or otherwise to prevent accumulations of dirt or grease, and in a position to prevent accumulations of standing water and to minimize rusting. Beams will be stored with the webs vertical.
  - G. Metals will be stored dry, all under cover and vented to prevent build-up of humidity, all off ground to provide air circulation.
  - H. Lumber will be stacked to provide air circulation. Store materials for which maximum moisture content is specified in an area where moisture content can be maintained.
  - I. Gypsum wallboard systems will be stored to protect all metal studs, furring, insulation boards, batts, accessories and gypsum board to prevent any type of damage to these materials. Rusted material components, damp or wet insulation or gypsum boards will not be accepted.



- J. Acoustical materials will be delivered to the job site in unbroken containers labeled and clearly marked. Materials will not be removed from containers until ready to install, but will be stored in dry area with cartons neatly stacked. Before installation, acoustical board will be stored for not less than 24-hours in the Work area at the same temperature and relative humidity.
- K. Linear items will be stored in dry area with spacers to provide ventilation. Stack linear items to prevent warping, complying with manufacturer's instructions.
- L. Paints and other volatile materials will be stored within approved safety containers. No glass jugs will be permitted. Storage areas will be equipped with not less than 2 fire extinguishers (CO2 type) sufficient to discharge a distance of 25-feet when fully charged and have current tags. No other building materials will be stored in this area. Used rags will be removed daily. Clean rags will be stored in metal closed containers.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

END OF SECTION

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**SECTION 01700**  
**PROJECT CLOSEOUT**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

The term "Project Closeout" is defined to include requirements near the end of the Contract Time, in preparation for Substantial Completion acceptance, occupancy by the County, release of retainage, final acceptance, final payment, and similar actions evidencing completion of the Work. Time of closeout is directly related to "Substantial Completion"; therefore, the time of closeout may be either a single period for the entire Work or a series of time periods for individual elements of Work that has been certified as substantially complete at different dates. This time variation, if any, will be applicable to the other provisions of this section.

**1.02 SCOPE OF WORK**

- A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:
  - 1. Final Cleaning
  - 2. Substantial Completion
  - 3. Final Acceptance
  
- B. The first filter to be reconstructed must be placed back into service prior to starting work on the second filter. The County will conduct a substantial completion inspection on this first unit and the Contractor will perform the performance testing requirements. Upon successful completion of this inspection, the County will assume ownership of the unit and work may begin on the second unit.

**1.03 RELATED WORK**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.
  
- B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 16.
  
- C. Section 01740 "Warranties and Bonds"

**1.04 PREREQUISITES FOR SUBSTANTIAL COMPLETION.**

When the Contractor considers the Work as substantially complete, submit to the County a written notice stating so and requesting an inspection to determine the status of completion. The Contractor will attach to the notice a list of items known to be incomplete or yet to be

corrected. Complete the following before requesting the County's inspection for certification of substantial completion.

- A. In the progress payment request that coincides with or is the first request following, the date substantial completion is claimed, show 100% completion or list incomplete items, the value of incomplete Work, and reasons for the Work being incomplete. Inspection procedures include supporting documentation for completion as indicated in these Contract Documents.
- B. Submit a statement showing an accounting of changes to the Contract Sum.
- C. Submit specific warranties, workmanship/maintenance bonds, maintenance agreements, final certifications and similar documents in accordance with Section 01740 "Warranties and Bonds."
- D. Obtain and submit lien releases enabling the County's full, unrestricted use of the Work and access to services and utilities.
- E. Submit Operation and Maintenance Manuals.
- F. Make final changeover of permanent locks. Submit keys and keying schedule.
- G. Deliver tools, spare parts, extra stock, and similar items.
- H. Complete final cleaning requirements necessary for Substantial Completion.

#### 1.05 FINAL CLEANING.

Complete the following cleaning operations prior to Substantial Completion or Owner occupancy.

- A. Remove from job site all tools, surplus materials, construction equipment, storage sheds, debris, waste and temporary services.
- B. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.
- C. Structures:
  - 1. Visually inspect exterior surfaces and remove all traces of soil, waste materials, smudges and other foreign matter.
  - 2. Remove all traces of splashed materials from adjacent surfaces.
  - 3. Ensure exterior surfaces have a uniform degree of cleanliness.
  - 4. Visually inspect interior surfaces and remove all traces of soil, waste materials, smudges and other foreign matter.
  - 5. Remove paint droppings, spots, stains and dirt from finished surfaces.
  - 6. Remove labels that are not permanent labels.
  - 7. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.

8. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Leave concrete floors broom clean.
9. Wipe surface of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean light fixtures and lamps.
10. Clean permanent filters of ventilating systems and replace disposable filters if units were operated during construction. Clean ducts, blowers and coils if units were operated without filters during construction.

#### 1.06 OPERATION AND MAINTENANCE MANUALS

- A. The Contractor will submit the proposed format, content and tab structure for all Operating and Maintenance Manuals for the County's review and approval. The tab structure for Operating and Maintenance Manuals will follow specification division format as accepted by the Construction Specification Institute. After the County approves the proposed format, content, and tab structure for the Operating and Maintenance Manuals, the Contractor will create and deliver 5 complete sets.
- B. Operation and Maintenance documentation is required for each piece of mechanical, electrical, communications, instrumentation and controls, pneumatic, hydraulic, conveyance, and special construction. If required by the technical specifications, provide Operation and Maintenance documentation for any other product not listed in the foregoing.
- C. The requirements of this Section are separate, distinct and in addition to product submittal requirements that may be established by other Sections of the Specifications. Owner's manuals, manufacturer's printed instructions, parts lists, test data and other submittals required by other Sections of the Specifications may be included in the Operating and Maintenance Manuals provided that they are approved and are formatted in a manner consistent with the requirements of this Section.
- D. Deliver Operation and Maintenance Manuals directly to the County.
- E. Operating and Maintenance Manual documents must include, but are not limited to, table of contents, approved submittals, manufacturer's operating and maintenance instructions, brochures, Shop Drawings, performance curves and data sheets annotated to indicate equipment actually furnished (e.g. identifying impeller size, model, horsepower, etc), procedures, wiring and control diagrams, records of factory and field tests and device/controller settings and calibration, program lists or data compact discs, maintenance and warranty terms and contact information, spare parts listings, inspection procedures, emergency instructions, and other Operating and Maintenance documentation that may be useful to the County. The material and equipment data required by this Section must include all data necessary for the proper installation, removal, normal operation, emergency operation, startup, shutdown, maintenance, cleaning, adjustment, calibration, lubrication, assembly, disassembly, repair, inspection, trouble-shooting, and warranty service of the equipment or materials.

- F. The Contractor must bind the Operating and Maintenance Manual documents in heavy-duty, 3-ring vinyl-covered binders including pocket folders for folded sheet information. Mark binder identification on both the front and spine of each binder. Binder information must list the project title, identify separate structures or locations as applicable, identify the general subject matter covered in the manual and must include the words "OPERATING AND MAINTENANCE INSTRUCTIONS".
  - 1. The Contractor must submit the Operating and Maintenance documents on three-hole punched, 8-1/2-inch x 11-inch sheets or on three-hole punched sheets that are foldable in multiples of 8-1/2-inch x 11-inch. The three-hole punched edge will be the left 11-inch edge.
  - 2. The Contractor may request waivers to the size requirement for specific instances. The Contractor's waiver request must be in writing to the County. The Contractor's waiver request must include a justification for seeking the waiver.
  
- G. The Contractor must provide an electronic version of the complete and final Operating and Maintenance Manuals in original electronic file format on compact disc or DVD. The Contractor must also provide one (1) electronic pdf file of each bound Operating and Maintenance Manual that represents each Manual's content. The electronic pdf file must match the Operating and Maintenance Manual content and organizational structure.

#### 1.07 SUBSTANTIAL COMPLETION INSPECTION PROCEDURES

- A. Upon receipt of the Contractor's request for inspection, the County will either proceed with inspection or advise the Contractor of incomplete prerequisites.
  
- B. Following the initial inspection, the County will either prepare the certificate of Substantial Completion, or advise the Contractor of Work which must be performed before the certificate will be issued. The County will repeat the inspection when requested in writing and when assured that the Work has been substantially completed.
  
- C. Results of the completed inspection will form the initial "punch list" for final acceptance.

#### 1.08 PREREQUISITES FOR FINAL ACCEPTANCE.

Complete the following before requesting the County's final inspection for certification of final acceptance, and final payment. List known exceptions, if any, in the request.

- A. Submit the final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates for insurance for products and completed operations where required.
  
- B. Submit written certification that:
  - 1. The County's final punch list of itemized Work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance.
  - 2. The Contract Documents have been reviewed and Work has been completed in accordance with Contract Documents.

3. Equipment and systems have been tested in the presence of the County and are operational.
4. Work is completed and ready for final inspection.

C. Submit consent of surety.

D. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

#### 1.09 FINAL ACCEPTANCE INSPECTION PROCEDURES

A. The County will re-inspect the Work upon receipt of the Contractor's written notice that the Work, including punch list items resulting from earlier inspections, has been completed, except for those items for which completion has been delayed because of circumstances that are acceptable to the County.

B. Upon completion of re-inspection, the County will either prepare a certificate of final acceptance or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled, which are required for final acceptance.

C. If necessary, the re-inspection procedure will be repeated.

#### **PART 2 - PRODUCTS (NOT USED)**

#### **PART 3 - EXECUTION (NOT USED)**

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**SECTION 01720**  
**PROJECT RECORD DOCUMENTS**

**PART 1 - GENERAL**

1.01 DESCRIPTION

- A. The purpose of the Project Record Documents is to provide the County with factual information regarding all aspects of the Work, both concealed and visible.
- B. To insure the Work was constructed in conformance with the Contract Drawings, the following survey documents are required to be prepared and certified by a Surveyor as per Spec Section 01050 Surveying and Field Engineering:
  - 1. Asset Attribute Data Form
  - 2. Pipe Deflection Table
  - 3. Gravity Main Data
  - 4. Boundary Survey and Survey Map Report for pump stations and easements with constructed improvements

The Asset Attribute Data and Pipe Deflection Table forms can be found on the County's web site:

<http://www.orangecountyfl.net/WaterGarbageRecycling/UtilitiesCapitalImprovementProgram.aspx>

1.02 DEFINITIONS

- A. As-Built Drawings: Drawings prepared by the Contractor's Surveyor depicting the actual location of installed utilities for the completed Work.
- B. Record Documents: All documents in subsections 1.04 and 2.02 in this specification.
- C. Boundary Survey: Boundary survey, map and report certified by a Surveyor shall be provided that meets the requirements of Chapter 5J-17 'Minimum Technical Standards', FAC.
- D. Surveyor: Contractor's Surveyor that is licensed by the State of Florida as a Professional Surveyor and Mapper pursuant to Chapter 472, F.S.
- E. Survey Map Report: As a minimum the Survey Map Report shall identify any corners that had to be reset, measurements and computations made, pump station and easement boundary issues, locations of constructed improvements outside boundaries, and accuracies obtained.

1.03 QUALITY ASSURANCE

- A. Delegate the responsibility for maintenance of the Record Documents to one person on

the Contractor's staff as approved by the County.

- B. Thoroughly coordinate changes within the Record Documents, making adequate and proper entries on each page of specifications and each sheet of Drawings and other documents where such entry is required to show progress and changes properly.
- C. Make entries within 24-hours after receipt of information has occurred.

#### 1.04 RECORD DOCUMENTS AT SITE

- A. Maintain at the site and always available for County's use one (1) record copy of:
  - 1. Construction Contract, Drawings, Specifications, General Conditions, Supplemental Conditions, Bid Proposal, Instruction to Bidders, Addenda, and all other Contract Documents
  - 2. Change Orders, Verbal Orders, and other modifications to Contract
  - 3. Written instructions by the County as well as correspondence related to Requests for Information (RFIs)
  - 4. Accepted Shop Drawings, Samples, product data, substitution and "or-equal" requests
  - 5. Field test records, inspection certificates, manufacturer certificates and construction photographs
  - 6. Paper copies of the Progressive As-Built Drawings
  - 7. Current Surveyor's tables for the Assets Attribute Data, Pipe Deflection Data, and Gravity Main Data
- B. Maintain the documents in an organized, clean, dry, legible condition and protected from deterioration, loss and damage until completion of the Work, transfer of all record data to the final As-built Drawings for submittal to the County.
- C. Store As-Built Documents and samples in Contractor's office apart from documents used for construction. Do not use As-Built document for construction purposes. Label each document "AS-BUILT" in neat large printed letters. File documents and samples in accordance with CSI/CSC format.
- D. Record information concurrently with construction progress. Do not conceal any Work until required information is recorded.

## **PART 2 - PRODUCTS**

#### 2.01 AS-BUILT DRAWINGS

- A. Maintain the electronic As-Built Drawings to accurately record progress of Work and change orders throughout the duration of the Contract.
- B. Date all entries. Enter RFI No., Change Order No., etc. when applicable.
- C. Call attention to the entry by highlighting with a "cloud" drawn around the area affected or other means. In the event of overlapping changes, use different colors for entries of

the overlapping changes.

- D. Design call-outs shall have a thin strike line through the design call-out and all As-Built information must be labeled (or abbreviated "AB") and be shown in a bolder text that is completely legible.
- E. Make entries in the pertinent other documents while coordinating with the County for validity.
- F. Entries shall consist of graphical representations, plan view and profiles, written comments, dimensions, State Plane Coordinates, details and any other information as required to document field and other changes of the actual Work completed. As a minimum, make entries to also record:
  - 1. Depths of various elements of foundation in relation to finish floor datum and State Plane Coordinates and elevations.
  - 2. Asset Attribute Data Form shall be completed in the Drawings.
  - 3. When electrical boxes, or underground conduits and plumbing are involved as part of the Work, record true elevations and locations, dimensions between boxes.
  - 4. Actually installed pipe or other work materials, class, pressure-rating, diameter, size, specifications, etc. Similar information for other encountered underground utilities, not installed by Contractor, their owner and actual location if different than shown in the Contract Documents.
  - 5. Details, not on original Contract Drawings, as needed to show the actual location of the Work completed in a manner that allows the County to find it in the future.
  - 6. The Contractor shall mark all arrangements of conduits, circuits, piping, ducts and similar items shown schematically on the construction documents and show on the As-Built Drawings the actual horizontal and vertical alignments and locations.
  - 7. Major architectural and structural changes including relocation of doors, windows, etc. Architectural schedule changes according to Contractor's records and Shop Drawings.

## 2.02 RECORD DOCUMENTS

- A. Three (3) paper copy sets and three (3) digital media sets of the following final Record Documents below.
- B. The following documents shall be signed and sealed by the Surveyor:
  - 1. Asset Attribute Data Form (see Specification Section 01050 "Surveying and Field Engineering," Table 01050-2 for an example)
  - 2. Boundary Survey of fee simple sites (pump station, etc.) and permanent easements with the respective Survey Map Reports
  - 3. Boundary Survey and Survey Map Report for the location of constructed pipes within any easements and right-of-way. As a minimum the Survey Map Report shall identify or describe the locations where the pipe centerline was constructed within 3-feet of the easement or right-of-way boundary, where the pipe was constructed outside the easement or right-of-way boundary, any corners that had to be reset, measurements and computations made, pump station boundary issues, and accuracies

- obtained. Survey map report shall be dated after the Work within the right-of-ways or easements have been completed.
4. Gravity Main Table (see Specification Section 01050 "Surveying and Field Engineering", Table 01050-4 for an example)
  5. Pipe Deflection Table (see Specification Section 01050 "Surveying and Field Engineering" Table 01050-3 for an example). An electronic blank table will be supplied by the County.
- C. Digital sets of the final Record Documents including but not limited to:
1. Scanned digital copies of the final As-Built Drawings
  2. Electronic Survey documents electronically sealed by the Surveyor
  3. Final Record Documents
  4. Digital file of As-Built Drawing in the Engineer's current version of AutoCAD file (dwg) format
- D. Pump station site Boundary Survey and Map Report.
- E. New Boundary Survey to re-establish easement corners, right-of-way monuments, or pump station site corners with monuments if destroyed by the Work.
- F. Scanned Documents: Scan Record Documents reflecting changes from the Contract Documents.
- G. The scanned "As-Built" Drawing sets shall be complete and include the title sheet, plan/profile sheets, cross-sections, and details. Each individual sheet contained in the printed set of the As-Built Drawings shall be included in the electronic drawings, with each sheet being converted into an individual tif (tagged image file). The plan sheets shall be scanned in tif format Group 4 at minimum of 400 dpi resolution to maintain legibility of each drawing. Then, the tif images shall be embedded into a single pdf (Adobe Acrobat) file representing the complete plan set. Review all Record Documents to ensure a complete record of the Project.
- H. Provide an encompassing digital AutoCAD file that includes all the information of the As-Built Drawings and any other graphical information in the As-Built Drawings. It shall include the overall Work, utility system layout and associated parcel boundaries and easements. Feature point, line and polygon information for new or altered Work and all accompanying geodetic control and survey data shall be included. The surveyor's certified As-Built Asset Attribute Data shall be added to the As-Built Drawings and Surveyor shall electronically seal the data in a comma-delineated ASCII format (txt).

### **PART 3 - EXECUTION**

#### **3.01 PRE-CONSTRUCTION MEETING**

- A. Pre-construction Meeting: It is recommended that the Surveyor attend the Pre-construction meeting. At the pre-construction meeting the Contractor shall be provided with a blank electronic version of the spreadsheet for the tables: Asset Attribute Data and

Pipe Deflection. The Contractor's surveyor shall use these tables to input the data and shall not alter the table format or formulas.

### 3.02 CONSTRUCTION PROGRESS MEETINGS

- A. Contractor shall provide progressive Record Documents described below:
1. Construction Contract, As-Built Drawings, Specifications, General Conditions, Supplemental Conditions, Bid Proposal, Instruction to Bidders, Addenda, and all other Contract Documents.
  2. Specifications and Addenda: Record manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed as well as any changes made by Field Order, Change Order or other.
  3. Change orders, verbal orders, and other modifications to Contract.
  4. Written instructions by the County as well as correspondence related to Requests for Information (RFIs).
  5. Accepted Shop Drawings, samples, product data, substitution and "or-equal" requests.
  6. Field test records, inspection certificates, manufacturer certificates and construction photographs.
  7. As-Built Asset Attribute Data Form: Surveyor shall obtain field measurements of vertical and horizontal dimensions of constructed improvements. The monthly submittal shall include the Surveyor's certified statement regarding the constructed improvements being within the specified accuracies as described in Specification Section 01050 "Surveying and Field Engineering", Table 01050-1 Minimum Survey Accuracies or if not, indicating the variances.
  8. Gravity Main Table: Surveyor shall prepare and update a Gravity Main Table to include as a minimum the pipe segment identification, pipe lengths, manhole inverts and tops, and slopes for gravity mains. Surveyor shall certify the data entered are correct and indicate if the minimum slopes have not been met.
  9. Pipe Deflection Table: Surveyor shall input the type of pipe, pipe manufacturer, PVC manufacturer deflection allowance, allowable angle of offset and radius of curvature, laying length of pipe, and coordinates. Surveyor shall certify the data entered are correct and indicate if the deflection allowance, offset or radius of curvature exceeds the manufacturer's recommendations.

### 3.03 FINAL RECORD DOCUMENTS SUBMITTAL

- A. Submit the Final Record Documents within 20-days after Substantial Completion.
1. Participate in review meetings as required and make required changes and promptly deliver the Final Record Documents to the County.

END OF SECTION

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**SECTION 01740**  
**WARRANTIES AND BONDS**

**PART 1 - GENERAL**

1.01 SCOPE OF WORK

- A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.

1.02 RELATED WORK

- A. Refer to Conditions of Contract for the general requirements relating to warranties and bonds.
- B. General closeout requirements are included in Section 01700 "Project Closeout."
- C. Specific requirements for warranties for the Work and products and installations that are specified to be warranted are included in the individual Sections of Division 2 through 16.

1.03 DEFINITIONS

- A. Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the County.
- B. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the County.

1.04 SUBMITTALS

- A. Submit written warranties to the County prior to requesting a Substantial Completion Inspection as outlined in Section 01700 "Project Closeout." If the Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the County.
- B. When a designated portion of the Work is completed and occupied or used by the County, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the County within 15-days of completion of that designated portion of the Work.

- C. When a special warranty is required to be executed by the Contractor, or the Contractor and a Subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the County for approval prior to final execution.
- D. Refer to individual Sections of Divisions 2 through 16 for specific content requirements, and particular requirements for submittal of special warranties.
- E. Prior to Substantial Completion Inspection, submit to the County two (2) copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, Subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
  - 1. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents and sized to receive 8-1/2-inch by 11-inch three-hole punched paper.
  - 2. Table of Contents will be neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification Section in which specified and the name of the product or work item.
  - 3. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address and telephone number of the installer, supplier and manufacturer.
  - 4. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS", the project title or name and the name, address and telephone number of the Contractor.
  - 5. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

#### 1.05 WARRANTY REQUIREMENT

- A. The Contractor will warrant all equipment in the Contractor's one-year warranty period even though certificates of warranty may not be required. For all major pieces of equipment, the Contractor shall submit a warranty from the equipment manufacturer. "Major" equipment is defined as a device having a 5 HP or larger motor or which lists for more than \$1,000.00.
- B. In the event that an equipment manufacturer or supplier is unwilling to provide a one-year warranty commencing at Substantial Completion, the Contractor will obtain from the manufacturer a warranty of sufficient length commencing at the time of equipment delivery to the job site, such that the warranty will extend to at least 1-year past substantial completion.
- C. If an individual specification section requires a particular warranty more stringent than that required by this Section or the General Conditions, the more stringent requirements will govern for the applicable portion of the Work.



- D. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- E. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty will be equal to the original warranty with an equitable adjustment for depreciation.
- F. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the County has benefited from use of the Work through a portion of its anticipated useful service life.
- G. County's Recourse: Written warranties made to the County are in addition to implied warranties, and will not limit the duties, obligations, rights and remedies otherwise available under the law, nor will warranty periods be interpreted as limitations on time in which the County can enforce such other duties, obligations, rights, or remedies.
- H. Rejection of Warranties: The County reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- I. The County reserves the right to refuse to accept Work for the project where a special warranty, certification, or similar commitment is required on such work or part of the Work, until evidence is presented that entities required to counter-sign such commitments are willing to do so.
- J. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and Subcontractors required to countersign special warranties with the Contractor.

## **PART 2 - PRODUCTS (NOT USED)**

## **PART 3 - EXECUTION**

### **3.01 DELIVERABLES**

- A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and Subcontractors, and bind into a commercial quality standard 3-ring binder; submit 5 copies of the warranties and bonds to the County for review.
  - 1. The warranties and bonds shall include:
    - a. Equipment or product description
    - b. Manufacturer's name, principal, address and telephone number

- c. Contractor, name of responsible principal, address and telephone number
- d. Local supplier's or representatives name and address
- e. Scope of warranty or bond
- f. Proper procedure in case of failure
- g. Instances which might affect the validity of warranty or bond
- h. Date of beginning of warranty, bond or service and maintenance contract
- i. Duration of warranty, bond or service maintenance contract

B. Warranties

1. Furnish an extended warranty for sanitary sewer main liner certified by the manufacturer for specified material properties for a particular job. The manufacturer warrants the liner to be free from defects in raw materials for 1-year from the date of acceptance. During the warranty period, any defects which affect the integrity or strength of the pipe shall be repaired at the Contractor's expense in a manner acceptable to the County.
2. Furnish an extended warranty for sanitary lateral liner certified by the manufacturer for specified material properties for a particular job. The manufacturer warrants the liner to be free from defects in raw materials for 1-year from the date of acceptance. During the warranty period, any defects which affect the integrity or strength of the pipe shall be repaired at the Contractor's expense in a manner acceptable to the County.

END OF SECTION

## SECTION 13221

### AUTOMATIC BACKWASH FILTER REHABILITATION

#### PART 1 - GENERAL

##### 1.01 SCOPE OF WORK

- A. The Contractor shall furnish all labor, materials, equipment and incidentals required for the rehabilitation of two (2) automatic backwash filters as described below. The existing filters have one media layer (sand) and are approximately 16 feet wide by 66 feet long each, contained in a concrete structure. The original manufacturer was Environmental Elements and they were constructed in 1983. No major reconstruction has occurred since installation.
- B. The scope of work shall include all elements specified herein, including the traveling bridge, the compartmental filter bottom, porous plates, filter media, cleaning and backwash mechanism complete with interconnected automatic operating PLC based controls including electrical wires, signal wires and electrical feed line system.

##### 1.02 WARRANTY

The Contractor shall provide a full five (5) -year warranty covering all materials and labor provided under this scope. Warranty shall commence upon substantial completion of the project and acceptance by the Owner.

##### 1.03 OPERATION AND MAINTENANCE MANUALS

Electronic operation and maintenance manuals shall be furnished covering all equipment and materials provided in the work. The manuals shall be prepared specifically for this installation and shall include all required cut sheets, drawings, equipment lists, and material descriptions that are required to instruct operation and maintenance personnel unfamiliar with such equipment. The manuals shall be in PDF format compatible with Adobe Acrobat. In addition, an electronic copy of the running PLC program in the programming software format shall be provided.

##### 1.04 PRODUCT HANDLING

All parts shall be properly protected so that no damage or deterioration will occur during a prolonged delay from the time of shipment until installation is completed and the equipment is ready for operation. On-site precautions shall be taken by the Contractor to ensure adequate protection during storage.

## 1.05 SHOP DRAWINGS

The Contractor shall submit for review, shop drawings, test reports, certifications and data on materials and equipment provided under this scope of work. The Contractor shall not begin any of the work covered by a drawing, data, or certification until this information has been reviewed and approved by the Owner. Examples of information required to be submitted prior to starting the work include but is not limited to: Pump and motor documentation including pump curves, certifications that the media meets the required material specifications, painting/coating systems, control panel layout drawing and wiring schematic, and UL certification for the panel.

## 1.06 QUALITY CONTROL

Equipment and material shall be manufactured by Aqua-Aerobic Systems, Inc., Infilco Degremont, or Evoqua Water Technologies.

## 1.07 DRAWINGS

The original construction drawings are attached to the specification as an appendix for informational purposes only.

## **PART 2 - PRODUCTS**

### 2.01 MATERIALS AND EQUIPMENT

- A. All structural steel used in the fabrication of the equipment shall be 316 stainless steel and conform to the requirements of "Specifications", ASTM Designation A-240. All welding shall conform to the latest standards of the American Welding Society.
- B. The following items on the existing filter system are not in need of replacement and shall be reused and/or repaired: Cell dividers, influent and effluent ports, rails and washwater troughs.
- C. The concrete structure will also be reused. No repairs are included to the concrete structure.

### 2.02 FILTER UNDERDRAIN SYSTEM

- A. Filter Bed: The filter bed shall consist of a series of partitions which divide the filter into a multiple of 8" wide compartments.
- B. Cell Dividers: The existing cell dividers shall be reused. Ninety eight (98) cell dividers are damaged and shall be reconstructed with a stainless steel repair cap made for such use.
- C. Influent and Effluent Headers: The existing influent and effluent headers shall be reused.

D. Filter Media Support System: The filter media support system shall consist of HDPE porous plates that meet the following requirements:

1. Porosity: 500 micron
2. Modulus of Rupture: 700lbs./sq. in.
3. Air Permeability: 100 S.C.F.M. per ft<sup>2</sup> per 1" thick plate at 1" water column pressure
4. Thickness: 1" (nominal)

E. The existing 1-inch thick porous plates shall be removed, replaced and completely sealed in place with a gasket-forming type sealant such as polyurethane. The porous plates shall be held down by a fiberglass reinforced polyester retaining angle attached to the cell divider with 1/4" stainless steel fasteners through factory pre-drilled holes. A slotted pipe system is not allowed.

### 2.03 GRANULAR MEDIA

A. Sand Media: The sand media shall be a high-grade silica sand with a minimum of 85% silica dioxide complying with Sections 1, 2.2 and 5 of the Standard Specifications for Filtering Material (AWWA Designation: B100-09). The sand shall be well graded and materials showing abnormal grading will be rejected. The particle size distribution shall be determined by screening through standard U.S. Series sieves. The percent size shall be determined from a plot of the percentages of the material passing each sieve, against the rated openings of the sieve. The 10% size or effective size shall be between 0.55 and 0.65 millimeters. The uniformity coefficient (ratio of 60% size to 10% size) shall not exceed 1.50.

B. The nominal collective depth of the media supplied shall be 11". The depth specified shall be obtained when the filter is completely submerged and after thorough backwashing to remove all media fines.

### 2.04 BACKWASH MECHANISM ASSEMBLY

A. Bridge: The existing bridge shall be replaced with a new stainless steel bridge. All components on the bridge, including the backwash and washwater pumps, the bridge deck (weldment 316 SS), washwater hood, the shafts, wheels, bearings, drive motor and gear box, skimmer and skimmer pump, backwash arm and shoe, backwash shoe tensioning assembly, wall spray system, level sensors, roller mast assembly, PVC piping for backwash and washwater with manual valves to control pump flow and the control panel shall be replaced.

- B. Pumps: The backwash and washwater systems shall each be powered by submersible pumps that shall have mountings suspended from the filter bridge. The pumps shall be constructed of cast iron. A single pump system shall not be allowed.
1. Each pump shall be capable of a minimum pumping rate of 17 gallons per minute per ft<sup>2</sup> of cell area. The pumps shall be equipped with stainless steel shafts and trim.
  2. All motors shall be provided with sealed conduit boxes. Motors shall be designed for 3 phase, 60 hertz, 460 volt power supply, NEMA B design, single-speed with Class B insulation.
- C. Backwash Shoe: The backwash shoe shall be mounted on the backwash frame such that it can independently follow any irregularities of the matching backwash wear strip. This flexible movement shall be controlled by 300 series stainless steel springs and fasteners. The shoe shall attach to Schedule 80 PVC piping by means of a flexible hose. A pivoting backwash frame is not allowed.
- D. Wear Strip: There shall be provided a replaceable wear strip against which the backwash shoe will slide. The strip shall be fastened to the effluent header sections by means of threaded 3/8" counter-sunk 316 stainless steel fasteners and internally threaded concrete insert anchors. The wear strip shall extend one foot beyond the headers on both ends of the basin. Its joints shall not superimpose the effluent header joints, but shall overlap the effluent header joints. The wear strip shall be surface mounted to the effluent wall. Wear strip shall be mounted to provide a smooth and linear face (no waves).
- E. Drive Mechanism: The bridge drive unit shall consist of one single speed motor with 1.15 service factor, a gear reducer, a drive shaft and self aligning, flanged bearings.
- F. All gearing shall be fully enclosed in an oil-tight cast housing with the gears running in oil and all bearings of anti-friction type.
- G. The steel drive shaft shall be turned, ground, polished and shall have a rust inhibiting PVC covering. The drive shaft shall be supported by self-aligning anti-friction ball bearings. All bearings shall have lubrication fittings easily accessible from the bridge walkway.
- H. All bridge wheels shall be solid, double-flanged, 316 stainless steel. Both wheels on backwash end of the bridge shall be locked to the shafts to maintain proper alignment with backwash wear strip. The wheels on the influent end of the bridge shall be capable of compensating for minor misalignment of rails by sliding on the shafts.

## 2.05 FLOATING VERTEX SKIMMER

- A. Skimmer: The automatic backwash system shall be fitted with a skimming device integral with the bridge and washwater hood supports. All structural members shall be fabricated from 304 stainless steel. Skimmer guide blades shall be fabricated from polypropylene and factory assembled to a 304 stainless steel frame for ease of installation. These skimmer guide blades shall direct all floating scum, grease or oils to two (2) floating vertex collection points, from which it shall be pumped to the launder trough. Each collection point shall have direct piping to a submersible skimmer pump. Both floating vertex collection points shall skim in either direction and shall be capable of scum removal at a minimum rate of 50 GPM at a 10 foot TDH with a 460 volt, three-phase, 60 Hz., motor.
1. Skimmer controls shall be mounted in the control panel to operate during the backwash cycle. A selector switch, with indicator light, shall be provided for manual operation.
  2. The skimmer pump shall be replaced. The skimmer pump shall be a heavy-duty cast-iron submersible type with a stainless steel motor shaft, 1/2 HP, sealed with class B insulation.

## 2.06 WALL SPRAY SYSTEM

Wall Spray: A wall spray system including 2" PVC globe pump throttling valves, stainless steel piping and fittings, flexible hose, brass spray nozzles and stainless steel hardware shall be supplied by the equipment manufacturer to be installed by the installing contractor. The system of spray nozzles and piping shall be provided to prevent algae growth on the basin walls above the water-line. The wall spray system shall be mounted to the washwater hood supports. The spray system shall obtain water through a manifold piped to the backwash supply line. The flow to the spray nozzles shall be controlled by a valves adjusted by the operator as deemed fit for the season.

## 2.07 FESTOON SYSTEM

- A. The electrical supply cable and the signal cable shall be replaced. The electrical supply cable shall be four conductors, #6 gauge each. The signal cable shall be eight conductors, #14 gauge each.
- B. Upon traveling to the end of the basin, the looped cable is extended to form a draped cable; as the cable returns, the loops are retracted by the action of the cable guide fastened to the bridge, towing the lead carrier.
- C. The festoon posts, seven (7) per filter shall be repaired.

D. Sand blast festoon posts and cross bars to a minimum of SSPC-SP6 requirements and coat (color shall be white) with one of the following (Carboline, Tnemec and PPG/Ameron are approved OCUD Appendix D suppliers):

1) Carboline: Two coats Carboline - Carboguard 890, 4-6 mils DFT per coat.

2) PPG/Ameron: Primer - one coat of Amercoat 240 High Build Epoxy at 6-12 mils DFT and Finish - one coat of Amercoat 240 High Build Epoxy at 6-12 mils DFT.

3) Tnemec: Prime coat – one coat Zinc Series 90-97 at 2.5-3.5 mils DFT per coat; intermediate coat Color Hi-build Epoxoline II Series N69 at 4-10 mils DFT per coat and final coat Endura-Shield Series 73 at 2-3 mils DFT per coat.

E. Replace eight (8) festoon trolleys.

## 2.08 FACTORY PAINTING

A. Shop painting (prime and finish) shall be carefully done by the equipment manufacturers and all coatings applied in a workmanlike manner in strict accordance with the paint manufacturer's published recommendations.

1. All ferrous metal purchase components including gear-motors, pumps, and bearings shall be given an additional top coat of safety blue enamel over the manufacturer's original finish prior to assembly.

## 2.09 RAIL SYSTEM

A. Inspect all rail anchors and report condition to the OWNER.

B. Remove damaged rail grout and repair. Assume 50 linear feet of total repair for purposes of this project. Do not assume that the 50 linear feet are continuous or contiguous.

C. Sand blast the rails and anchors to a minimum of SSPC-SP3 requirements and re-coat the anchors and the side of the rails. Do not paint the rail tops. See 2.06 D for paint specifications.

## 2.10 WASHWATER TROUGHS

A. Repair washwater troughs by installing new caulk in the joints.

B. Verify hardware connections and replace hardware that has failed.

C. Caulk all holes and openings.

## 2.11 CONTROL SYSTEM



- A. The automatic and manual controls for operation of the system shall be furnished fully assembled, wired and pre-programmed in a UL certified control enclosure.
- B. Included with the panel are control relays and PLC, and level sensing probes whereby the pump motors and drive motor may be actuated automatically by a predetermined increase in hydraulic head, or by the PLC to control the interval between each cleaning cycle automatically. The cleaning cycle is terminated by a signal from the level sensing probe signaling low water. The existing level sensing probes shall be reused. The "off-time" of the cleaning cycle is controlled by the PLC with an adjustable range. When the PLC times out, the motors are actuated. During the "on-time", the PLC timer function resets for starting off-time at the end of the cycle. Should high water occur during off-time, the motors are started by a relay actuated from the high water electrode signal, with a corresponding resetting of the PLC timer function.
- C. The control sequence for the backwash mechanism shall be wired so that the backwash mechanism stops at either end of the filter upon termination of the backwash cycle, which will be at the low operating probe signal. A low water shutoff probe shall prevent pumping the filter tank below the minimum water level point.
- D. The control system shall include the control components and practices specified herein.

2.11.1 CONTROL PANEL WIRING AND ASSEMBLY

- A. All control enclosures shall be custom assembled and wired in an Underwriters Laboratories (UL) certified cabinet shop using quality materials and labor.
- B. All control panel wire shall be 16 AWG multi-strand machine tool wire (MTW) minimum, with PVC insulation.
- C. Wire colors are as follows:

208 VAC or higher	-	Black
120 VAC control power	-	Red
Neutral	-	White
Ground	-	Green
AC Power from remote source	-	Yellow
Neutral from remote source	-	White with Yellow Stripe
24 VDC (+)	-	Blue
24 VDC (-)	-	White with Blue Stripe
VDC (+) from remote source	-	Orange
VDC (-) from remote source	-	White with Orange Stripe
Intrinsically Safe	-	Light Blue

- D. All wires shall be clearly marked with an identification number consistent with the wiring schematic drawing. Wire markers shall be a thermal transfer printable type. The material shall be a self-laminating vinyl. Labels shall be Brady THT-9-427-10 or approved equal.
- E. Wiring inside the control panel shall be run in PVC wiring duct rated for continuous temperatures up to 122° F (50°C). Devices mounted in the enclosure door shall have wires run in spiral wrap to avoid pinch points when opening and closing the door.
- F. Control components mounted internal and external to the enclosure shall be mounted with stainless steel hardware and clearly labeled with a plastic identification nametag. The tag shall be white with black lettering.
- G. Individual stainless Steel disconnects shall be installed at each filter.

#### 2.11.2 CONTROL PANEL QUALITY ASSURANCE

- A. All Control panels shall be UL certified, with evidence provided prior to shipment. Testing shall consist of the following:

Point to point testing of all wiring prior to application of power

Intended supply voltage shall be applied to the enclosure

All components shall be tested for proper operation and calibration

The timer function and level controls shall be functionally checked

All components shall be checked to confirm proper mounting specifications have been followed

Enclosure shall be inspected for defects and repaired if necessary

All labeling of wires and devices are correct, properly installed and clean

- B. Upon the successful completion of the control testing of the enclosure assembly, all applicable documentation (i.e. finalized drawing set, device data sheets, etc.) shall be placed in the drawing pocket of the enclosure.

#### 2.11.3 CONTROL ENCLOSURE

- A. The automatic controls shall be provided in a UL listed, NEMA Type 4X stainless steel (14 gauge) enclosure that provides insulation and protection for electrical controls and components from highly corrosive environments indoors and outdoors. Enclosure shall include a seamless foam-in-place gasket to assure watertight and dust-tight seal. An internal 3-point latch and 316SS padlocking POWERGLIDE® handle shall be provided. Enclosure shall include a painted white mild steel (12 gauge) sub-panel mounted with collar studs. Enclosure shall be manufactured by Hoffman or approved equal.

#### 2.11.4 CORROSION INHIBITOR

- A. Each control enclosure assembly shall be provided with corrosion inhibitors to protect interior electrical components from damage caused by high humidity. The corrosion inhibitors shall be installed prior to shipment to provide protection during shipment and storage of the enclosure. The corrosion inhibitor shall be Hoffman AHCI5E or approved equal.

#### 2.11.5 MAIN DISCONNECT CIRCUIT BREAKER

A UL listed, automatic molded case 3-pole disconnect breaker shall be provided in the control enclosure(s). The primary function of the disconnect switch shall be to provide a means to manually open a circuit and automatically open a circuit under overload or short circuit conditions. The disconnect breaker shall have a door mounted operating mechanism with trip indication. Power distribution connectors shall be mounted integrally to the circuit breaker for multiple load connections. Integral connectors shall be provided. The disconnect circuit breaker shall be a Square D/FAL, HDL, JDL, LAL, MGL, PGL or approved equal.

#### 2.11.6 MOTOR STARTER

Starters shall be full voltage reversing and non-reversing. Each starter shall consist of a contactor and overload relay. Assembled starter shall comply with NEMA, UL, EEMAC, CSA, IEC, VDE and other international standards. Contactors shall be rated 600 V, 60 hertz AC unless otherwise noted. Mechanical-life of 10 million make/break operations. Auxiliary contacts shall be rated for AC 600 V max., at 120 V contacts rated for 60 AMP make and 6 AMP break. Overload relay shall have NEMA class 10 tripping characteristics, ambient compensation, time delay and phase loss sensitivity, reset button with trip-free feature, manual/automatic reset, circuit test button and field adjustable.

#### 2.11.7 TRANSFORMER

A step-down multi-tap transformer shall be supplied when there is a necessity to reduce incoming 3-phase power to 120 VAC single-phase. The transformer power wire connections (incoming and outgoing) shall be protected with a finger-safe cover to protect against accidental contact. Primary and secondary fuse protection shall be provided. Transformer shall be UL listed and of continuous wound construction with vacuum impregnated with non-hygroscopic thermosetting varnish. Transformer shall be Square D 9070T or approved equal.

#### 2.11.8 TRANSFORMER PRIMARY AND SECONDARY FUSE

Properly rated fuses and fuse blocks shall be provided for primary and secondary protection of the transformer. Each fuse shall be equipped with a thermoplastic cover to protect against accidental contact. Clip style fuse block shall be rated up to 600 VAC and 100 amps, dual element, time delay fuses shall be rated up to 600 VAC. Fuse blocks and

fuses shall be UL listed. Fuses shall be Littelfuse Class CC or approved equal. Fuse blocks and fuse covers shall be manufactured by Marathon or approved equal.

#### 2.11.9 CIRCUIT BREAKER

All single phase branch or supplementary circuits shall be protected with a single-pole, C-Curve rated circuit breaker. Circuit breakers shall be rated for 240 VAC maximum, 50/60 Hz and UL 489 listed. Supplementary and branch protection circuit breakers shall be Merlin Gerin Multi 9 or approved equal.

#### 2.11.10 FUSE

Properly rated fuses and fuse holders shall be provided for protection of individual control devices (discrete and analog signals) mounted outside of the enclosure. Each fuse shall be housed in a hinged type fuse block to protect against contact with the fuse. Fuses shall be rated up to 250 VAC and be Littelfuse or approved equal. Fuse holders for discrete devices shall be rated to 600 VAC and 30 Amps. Fuse holders for analog devices shall be rated to 300 VAC and 15 Amps. Fuse holders shall be Allen Bradley 1492 or approved equal.

#### 2.11.11 OPERATOR DEVICE

- A. Operator devices (pushbuttons and selector switches) shall be mounted through the control enclosure door for manual operation of the filter. Transformer type pilot lights and illuminated pushbuttons shall be provided for indication of an operation status. Lights shall be 24 VDC LED type lamps. Color coding shall be applied as required and is as follows:

Amber – Alarm active, caution

Green – Valve open, motor running

Red – Valve closed

White – Information

- B. All operator devices shall be UL Listed, 30.5mm style, NEMA Type 4X rated, oil and water tight with finger safe guards located on the contact blocks to prevent accidental contact with wire connections. Operator device function shall be identified with an engraved white Gravoply nameplate with black letters. Operator devices shall be Allen-Bradley 800H, Square D 9001, or approved equal.

#### 2.11.12 INDUCTION RELAY

An induction relay shall be provided for liquid level alarming and control of pumps and motors utilizing level sensing probes. The induction relay shall provide field convertible

contacts rated for 25 amps at 120 VAC or 240VAC. Induction relay shall be B/W Controls 1500 or approved equal.

#### 2.11.13 CONTROL RELAY

UL listed control relays for general control purposes shall be supplied with a pilot light to indicate when the coil is in an energized state. The relay socket shall be panel or DIN rail mounted inside the enclosure. The relays shall provide the following ratings: 120VAC coil, 10A contact rating (thermal), 250 VAC insulation rating and 5 million mechanical life cycles. Relays shall be Allen Bradley 700-HK, Square D, or approved equal.

#### 2.11.14 HIGH FREQUENCY NOISE FILTER

A UL listed active tracking filter shall be provided to protect the PLC and HMI power feeds from high-frequency noise and low-energy transients. It shall be designed for a single phase input voltage of 120/240VAC operating at 47 to 63 Hz. The unit shall reduce normal mode transients to plus or minus 2 volts, provide surge capacity of 45,000 amps and protect in all modes (Line to neutral, line to ground and neutral to ground). The noise filter shall be an Islatrol IC+ or approved equal.

#### 2.11.15 GROUND FAULT DUPLEX RECEPTACLE

A UL listed ground fault circuit interrupter (GFCI) duplex receptacle shall be provided within the panel for instrument (e.g. programming terminal, modem, etc.) use only. The receptacle shall be protected with a 5 Amp circuit breaker. The receptacle shall carry a 20A / 120VAC rating. The electro-mechanical circuit interrupter shall be double-pole and trip free (GFCI protection and shall not be overridden by holding reset button). Built-in transient suppression shall protect GFCI's internal circuitry from voltage transients. Receptacle shall be Hubbell DRUBGFI20 or approved equal.

#### 2.11.16 24 VOLT DC POWER SUPPLY

A UL listed, industrial grade, compact power supply shall be supplied to provide 24 VDC power to such rated components. The power supply shall be DIN rail mounted and functional with input voltage of 100 to 240 VAC (single-phase) incoming control power. The power supply shall have a green LED which shall be illuminated when output voltage is "OK". The power supply shall be an Allen Bradley 1606 or approved equal.

#### 2.11.17 PROGRAMMABLE LOGIC CONTROLLER SYSTEM

##### A. GENERAL:

The Programmable Logic Controller (PLC) system shall be configured as required to support the I/O of the Automatic Backwash Filter. The PLC system shall be a Siemens model as specified herein and shall include a central processing unit (CPU), power supply

and input/output (I/O) modules. All PLC system components shall be assembled into the control cabinet via a mechanical mounting rack and shall provide a functioning control system.

#### B. CENTRAL PROCESSING UNIT:

The PLC processor shall be Siemens S7-1516-3PN/DP (6ES7516-3AN00-0AB0), equipped with Ethernet Profinet and Profibus DP communication interface and minimum 1 MB integrated working memory for program and a minimum of 5 MB for data. A memory module for the processor shall be provided. The Load memory module shall be a minimum of 4 MB. The PLC shall be programmed in accordance with County standards.

#### C. POWER SUPPLY:

A PLC power supply shall provide power to the processor and I/O modules of the PLC system via a connecting comb. Power supplies shall have 120/230VAC nominal input voltage and 24VDC rated output.

#### D. INPUT/OUTPUT MODULES:

The input/output (I/O) system shall be configured as a modular designed to communicate with the CPU.

The following types of I/O modules shall be provided:

Analog Input Module: Analog input modules shall have eight (8) 4-20 mA DC input channels.

Analog Output Module: Analog output modules shall have eight (4) isolated 4-20 mA DC channels.

Digital Input Module: Digital input modules shall have sixteen (16) discrete input channels.

Digital Output Module: Digital output modules shall have sixteen (16) digital output channels.

I/O modules shall be provided in the quantities and types required to serve the I/O signal circuits identified in the I/O List.

### 2.11.18 HUMAN MACHINE INTERFACE OVERVIEW

A. The control system shall be equipped with a UL listed operator interface that provides control display screens. These screens shall be used by the operator to monitor and control filter status, setpoint and alarm information.

B. The Interface shall allow the Operator access to adjust the following operating parameters at a minimum:

- Backwash interval
- Backwash duration
- Number of Backwashes between Solids Waste interval.

C. The operator interface shall provide information to assist the Operator in assessing the status of the filter system. The interface screen shall display, at minimum, the following parameters:

- Water level in the filter
- Time since last Backwash
- Time since last Solids Waste withdrawal
- Elapsed time on the Drive Motor
- Elapsed time on the Backwash/Waste Pump(s)
- Total Backwash time and cycles

D. The operator interface shall allow the Operator to:

- Initiate Backwash
- Control all electric actuated valves

E. The interface shall display the alarm history. The alarm history shall include the time and date of the most recent 25 alarms along with the description of the alarm.

F. The interface shall also display current alarms, including the date, time and a description of the alarm.

G. As a diagnostic aid to the Operator, the interface shall display the time between Backwashes for the most recent 40 Backwashes.

#### 2.11.19 HUMAN MACHINE INTERFACE TERMINAL

The Human Machine Interface (HMI) Terminal shall be a NEMA Type 4X/12 rated, 6” LCD STN color display and resistive analog touch screen. The HMI shall have a minimum of 2 MB application memory. Communications interface to associated PLC shall be via Ethernet. The HMI shall be a Siemens Comfort TP1500 and programming shall be performed and coordinated with Orange County personnel to insure proper functionality with the existing control system at the facility.

#### 2.11.20 HUMAN MACHINE INTERFACE SUN SHIELD

A sun shield constructed of 316 stainless steel shall be mounted over the operator interface to provide protection and visibility of operator screens in outdoor applications.

If possible the control panel shall be mounted such that the interface screen is pointed in the north direction.

#### 2.11.21 TERMINAL BLOCK

Standard feed-through screw terminal blocks, DIN rail mounted, shall be supplied for all point to point wiring connections. All terminals shall be numbered per the wiring schematic with printed markers. Terminals shall carry a 600V AC/DC voltage rating. Terminal blocks shall be Allen-Bradley 1492-J4 (35A max) and 1492-J16 (85A max) or approved equal.

### PART 3: EXECUTION

#### 3.01 INSTALLATION

- A. The Contractor shall remove all media from the filter bed, and then all hold down angles, spacer rods, hardware, caulk, and existing porous plates. After removal, all cell dividers shall be inspected and ledges shall be cleaned to be free of caulking. Once the unit is clean, new HDPE porous plates, sealant, retaining angles, and hardware, and the wear strip shall be installed. After this is completed, a light test shall be performed to assure the plates are installed properly. It is assumed the existing spacer rods will be reused.
- B. The Contractor shall erect a tent over the filter (work shall proceed only on one filter at a time) to protect the work from sunlight, rainfall and excessive heat during the caulking process and caulk curing period. Tent may be removed/relocated after the caulk has cured for a minimum of 7 days.
- C. The Contractor shall install the new bridge components, including the skimmer pump, washwater pump and backwash pump. A new PLC based control panel shall be installed on the bridge. The Contractor's licensed electrician shall wire the new control panel and the new backwash, washwater and skimmer pumps into the system. A new backwash shoe and tensioning assembly shall be installed. New shafts, wheels, bearings and drive shall be installed. Once the shafts, wheels and bearings have been installed, the Contractor shall adjust the bridge tracking as needed to confirm that the bridge will track properly on the rails.
- D. The Contractor shall install new electrical cable and signal cable on the existing festoon system. See 3.02 Electrical Connection.
- E. After the caulk used for the installation of the porous plates and dividers has cured for a minimum of seven (7) days, the Contractor shall install the media.
- F. The Contractor shall be responsible for offloading all equipment, removal and disposal of media in accordance with local and State regulations, and providing all equipment, tools, or other items necessary for completion of the work.



- G. Electrical service at 110V, 20 amp is available in the area of the work and electricity from this source will be provided by the Owner at no charge to the Contractor.

### 3.02 ELECTRICAL CONNECTION

- A. Two 30 Amp breakers are provided in the existing MCC, one for each filter. Wire (#8 THHN) and conduit are existing between the breakers and the filter location. The Contractor's licensed electrician shall install and connect two separate stainless steel disconnects (one for each filter). The electrician will connect the filter power supply cable from the filter electrical control panel to the disconnect and then from the disconnect to the filter control panel. A riser and other necessary supports shall be provided for the power and signal cables from the disconnect to the filter control panel such that there is a clear and safe pathway under the cable.
- B. The Contractor shall also install the new electrical and signal cables on the existing festoon system.

### 3.03 START-UP

Prior to system start-up, the Contractor shall successfully complete all field testing of the individual components incorporated into the work, including the instrumentation and controls. The Contractor shall provide a checklist of all digital and analog signals to be tested and verified. The Owner shall witness the testing and verification of all signals. The Contractor shall then commence the start-up of the complete system and shall be responsible for running the system in automatic for five consecutive days as a demonstration of performance. See 3.04 Filter Demonstration Testing and Training.

### 3.04 FILTER DEMONSTRATION TESTING AND TRAINING

- A. Contractor shall assume that the influent TSS to the filters is no greater than 25 mg/l.
- B. The filter effluent shall contain less than five (5) mg/l to be considered successful. Samples (three per day) shall be taken during the morning peak hour, the evening peak hour and the midday low flow. No single sample shall exceed 5 mg/l during the testing/performance period. If the system fails during this demonstration of performance, the Contractor shall correct the source of failure, and the test shall restart at day zero. If the influent exceeds 25 mg/l at any time during the test, the plant operator shall be notified and OCUD shall be given the opportunity to correct the situation. If the effluent samples taken during this event (exceedence) are within the test criteria, the test will remain valid. If not, then the test will start over again and the contractor shall be compensated for the time spent performing the initial test.

- C. The filter effluent chamber shall be thoroughly cleaned immediately prior to the testing period. There shall be no visible materials (filter sand) in the filter effluent chamber before, during or after the completion of the test. Materials (filter sand) in the effluent chamber shall be considered a failure of the system and the contractor shall correct the problem.
- D. Upon successful completion of the five-day test, training shall be provided to the Owner's personnel. Four (4) two-hour training sessions shall be provided by the equipment manufacturer's representative. The two-hour training session shall be provided to two separate groups at the wastewater facility. One group is the operations staff and the other group is the maintenance staff. The same two-hour training shall be provided to both groups. In addition, the same two-hour training session shall be provided on two separate occasions on different days, to accommodate the shift schedule of plant personnel. Upon completion of the training, a Training Disk shall be provided with all of the information presented in the two-hour training session. Upon delivery of all close out documentation to OCUD, the project will be considered substantially complete, and the warranty period will be allowed to commence.

### 3.05 SPARE PARTS

- A. The contractor shall provide the following spare parts:
  - 1) Lights and fuses of each size and/or type for the control panel (Qty. 3 of each size).
  - 2) Backwash pump (Qty. 1).

END OF SECTION

**Appendix A**

**Orange County Eastern Water Reclamation Facility  
Phase I/II Automatic Backwash Filter Record Drawings  
And  
Disk Filter Drawings**

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SQ # 1083

EASTERLY ORANGE COUNTY  
SUBREGIONAL WASTEWATER  
FACILITIES PROGRAM

THE EASTERN SUBREGIONAL  
WASTEWATER TREATMENT PLANT  
PHASE 2

RECORD DRAWINGS  
DECEMBER 1984

BOARD OF COUNTY COMMISSIONERS

Lou Treadway Chairman, District 5			
Vera Carter Commissioner District 1	Tom Dorman Commissioner, District 2	Hal Marston Vice Chairman, District 3	Bob Harrell Commissioner, District 4
James L. Harris Orange County Administrator	J. Charles Gray, Esq. Orange County Attorney	Keith Denton Assistant County Administrator	Carl Overstreet Deputy Director, Division of Public Utilities

DATE: MARCH 1983  
PROJECT NO. 6059-207  
CONFORMED JUNE 1983

CAMP DRESSER & MCKEE INC.  
ENVIRONMENTAL ENGINEERS  
ORLANDO, FLORIDA



CDM

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## ABBREVIATIONS

### GENERAL

ALUMINUM  
ANGLE  
BENCH MARK  
BETWEEN  
CENTER LINE  
CENTER TO CENTER  
DIAMETER  
DIAGONAL  
DIMENSION  
DRAWING  
EACH  
ELEVATION  
EFFLUENT  
EXISTING  
FINISH  
FLOOR  
HIGH  
HIGH POINT  
INFLUENT  
LONG  
LOW POINT  
MATERIAL  
MANUFACTURE  
MAXIMUM  
MECHANICAL  
METAL  
MINIMUM  
MOUNTED  
NOMINAL  
NOT TO SCALE  
NUMBER  
ON CENTERS  
OPTION  
OPPOSITE  
OPENING  
OR EQUAL  
PIECE  
POINT  
POUND  
PLATE  
RADIUS  
REQUIRED  
ROOM  
SQUARE  
STAINLESS STEEL  
SIDEWALK  
SHEET  
SYMMETRICAL  
SECTION  
STANDARD  
STEEL  
THICK  
TYPICAL  
TEMPORARY  
THREADED  
VERTICAL  
WIDE  
WITH  
WATER LEVEL  
WEATHERPROOF  
WATER  
RIGHT OF WAY  
LOW WATER LEVEL  
HIGH WATER LEVEL  
SIMILAR  
SPECIFICATIONS

### PUMPS

PLANT EFFLUENT PUMP  
TRANSFER PUMP  
BACKWASH SUPPLY PUMPS  
BACKWASH TRANSFER PUMPS  
BACKWASH RECOVERY PUMPS  
WASTE SLUDGE PUMPS  
SLUDGE DISPOSAL PUMPS  
RECIRCULATION SLUDGE PUMPS  
LIME SLURRY FEED PUMP  
POLYMER FEED PUMP  
FLUOSILICIC ACID FEED PUMPS  
FLUOSILICIC ACID TRANSFER PUMPS  
SAMPLE PUMP  
PUMP PUMP  
SLUDGE FEED PUMP  
REUSE WATER PUMP

### PIPE

AL., ALUM.  
L.  
B.M.  
BTWN.  
C.  
C.C.  
DIA., DIAM.  
DIM.  
DIAG.  
DIM.  
DWG.  
EA.  
EL., ELEV.  
EFF.  
EXIST.  
FIN.  
FL.  
H.  
H.P.  
INFL.  
L.G.  
L.P.  
M.T.L.  
MFG.  
MAX.  
MECH.  
MET.  
MIN.  
MTO.  
NOM.  
N.T.S.  
NO.  
O.C.  
OPT.  
OPP.  
OPNG.  
O/E.  
P.C.  
PT.  
LB.  
PL.  
RAD., R.  
REQ'D.  
RM.  
SQ.  
S.S.  
SOWK.  
SH, SMT.  
SYMM.  
SEC.  
ST'D.  
STL.  
THK.  
TYP.  
TEMP.  
THD.  
VERT.  
W.  
W/  
W.L.  
WPF.  
WTR.  
R/W.  
L.W.L.  
H.W.L.  
SIM.  
SPECS.

### VALVES, FITTINGS, ETC.

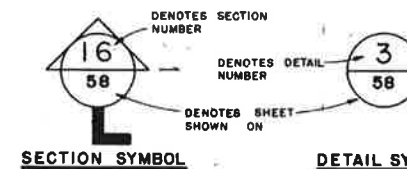
AIR CUSHION CHECK VALVE  
BALL CHECK VALVE  
BALL VALVE  
BLIND FLANGE  
BURIED GEAR OPERATOR  
BUTTERFLY VALVE  
CHECK VALVE  
ELECTRIC VALVE ACTUATOR  
ELEVATED GEAR OPERATOR  
EXPANSION JOINT  
FIRE HYDRANT  
FITTINGS  
FLANGED ADAPTOR  
FLEXIBLE COUPLING  
FLOOR BOX (BUSHING TYPE)  
FLOOR STAND  
GATE VALVE (QUICK OPENING)  
GATE VALVE (DOUBLE DISC)  
GATE VALVE (SOLID WEDGES)  
HYDRAULIC VALVE ACTUATOR  
MECHANICAL JOINT PLUG  
PLUG VALVE  
SILENT CHECK VALVE  
UNION  
VALVE BOX  
VICTAULIC COUPLING  
VICTAULIC COUPLING (GROOVED ENDS)  
VICTAULIC COUPLING (SHOULDERED ENDS)  
WALL SLEEVE  
WALL PIECE (WITH WATER STOP)

### MISCELLANEOUS

CLEANOUT  
EQUIPMENT DRAIN (FLUSH TYPE)  
EQUIPMENT DRAIN (EXTENDED TYPE-OPEN)  
EQUIPMENT DRAIN (EXTENDED TYPE-SEALED)  
EXHAUSTER  
FLOOR DRAIN  
HOSE BIBB (1" SIZE)  
HOSE BIBB (3/4" SIZE)  
HOSE BIBB (COMBINATION OF 1" & 3/4" SIZE)  
MANHOLE  
ROOF DRAIN  
VARIABLE SPEED DRIVE  
VENT  
VENT THROUGH ROOF  
JANITOR CLOSET  
AIR CONDITIONING UNIT  
DRAIN SPOUT  
ELECTRIC DRINKING FOUNTAIN  
HOT WATER HEATER

### SYMBOLS

ACC.V.  
BCV  
BAV  
BF.  
BO  
BV  
CV  
EVA  
EO  
EXJ  
FH  
FIB  
FA  
FC  
FB  
FS  
GV (GO)  
GV  
RM.  
GV (W)  
HVA  
MJP  
PV  
SCV  
UN  
VB  
VC  
VC (G)  
VC (S)  
WS  
WP



SECTION SYMBOL

DETAIL SYMBOL

SECTION AND DETAIL NUMBERING SYSTEM

RECORD DRAWING



DESIGNED BY: W.M.S.  
DRAWN BY: K.J.H.  
CHECKED BY: D.G.P.  
APPROVED BY: J.R.C.  
DATE: MARCH 1983

REVISIONS

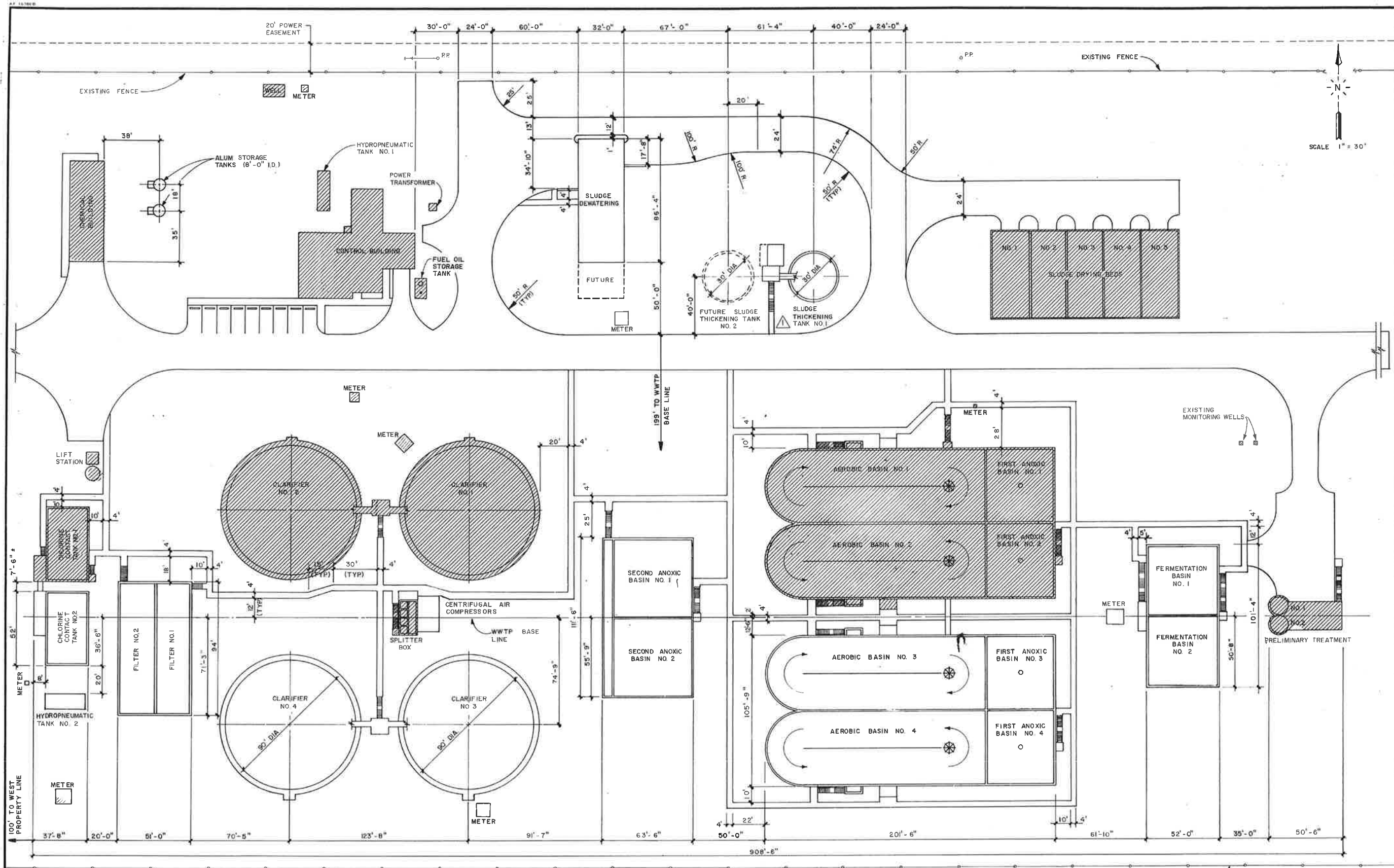
NO.	REVISED PER	ADDENDUM	NO.
1	6/83	R.V.	
2	12/84	K.U.H.	

CAMP DRESSER & MCKEE INC.

EASTERN SUBREGIONAL WWTP - PHASE II  
FOR  
ORANGE COUNTY, FLORIDA  
INDEX AND ABBREVIATIONS

PROJECT NO.  
6059-207

SHEET NO.  
2



SCALE 1" = 30'

N

**LEGEND**

	NEW STRUCTURE THIS PROJECT
	EXISTING STRUCTURE
	ALTERNATE BID ITEM
	FUTURE STRUCTURE

DESIGNED BY	W.M.S.			
DRAWN BY	ALLN			
CHECKED BY	D.G.M.			
APPROVED BY	D.R.R.			
DATE	MARCH 1983			
REV. NO.	DATE	DRWN	CHKD	REMARKS
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CAMP DRESSER & MCKEE INC.

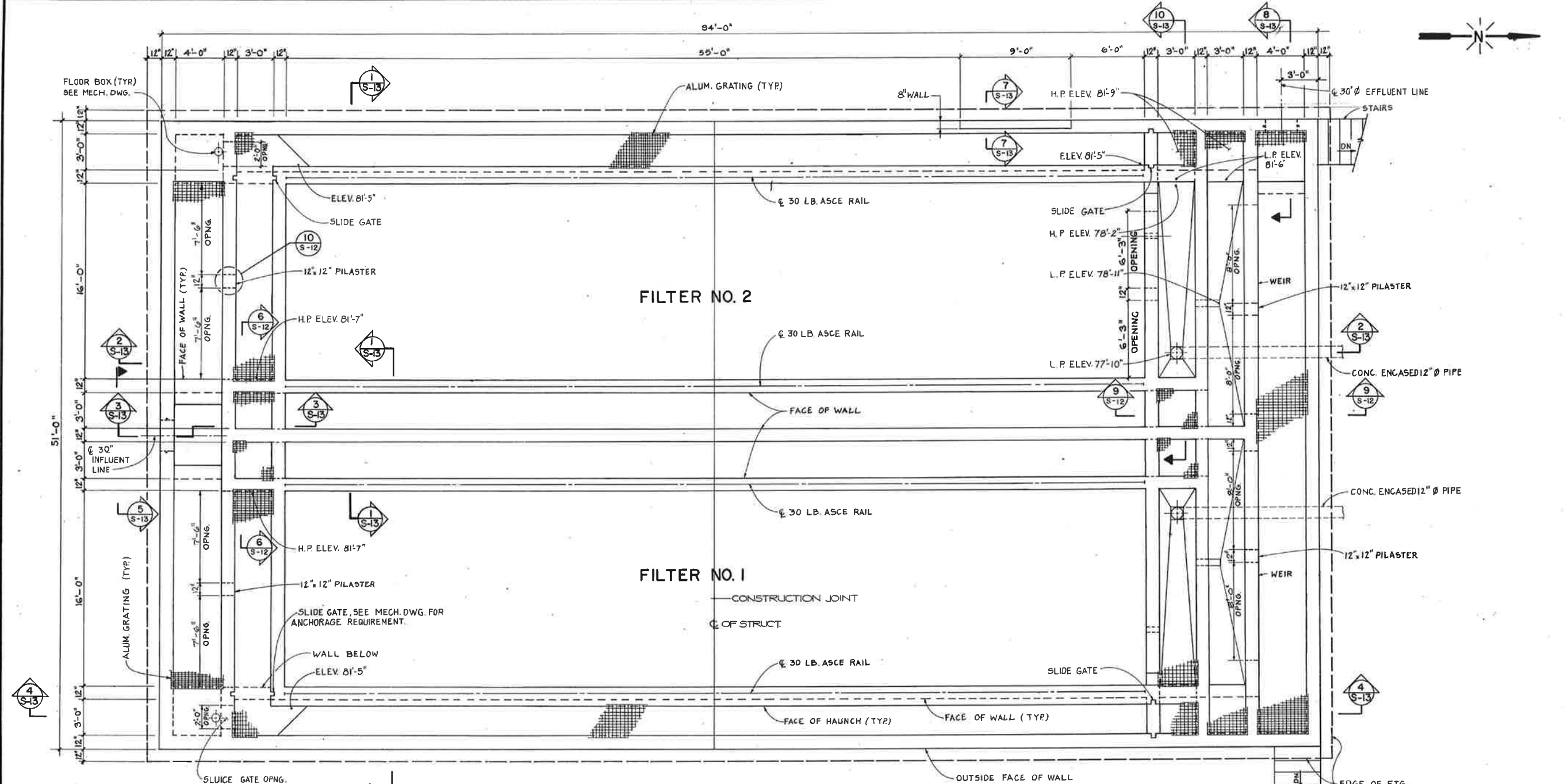
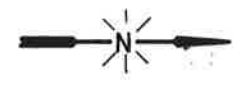
DESIGNED BY W.M.S.  
 DRAWN BY ALLN  
 CHECKED BY D.G.M.  
 APPROVED BY D.R.R.  
 DATE: MARCH 1983

**EASTERN SUBREGIONAL WWTPhase II**  
 FOR  
 ORANGE COUNTY, FLORIDA  
**PLOT PLAN**

PROJECT NO. 6059-207  
 SHEET NO. C-3

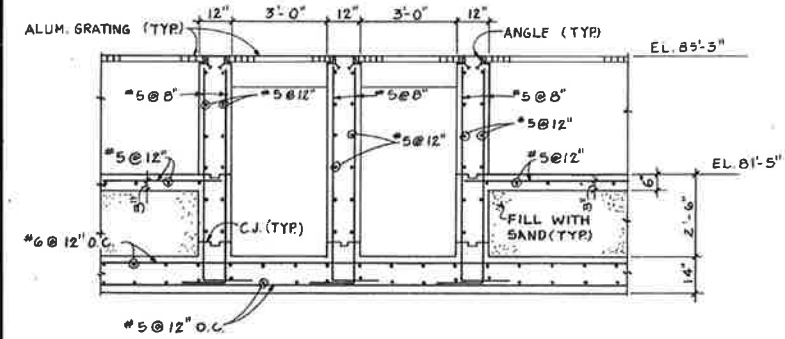
RECORD DRAWING



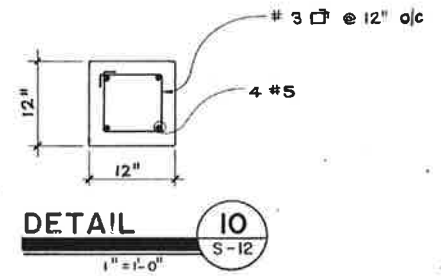


**PLAN AT ELEVATION 85'-3"**  
1/4" = 1'-0"

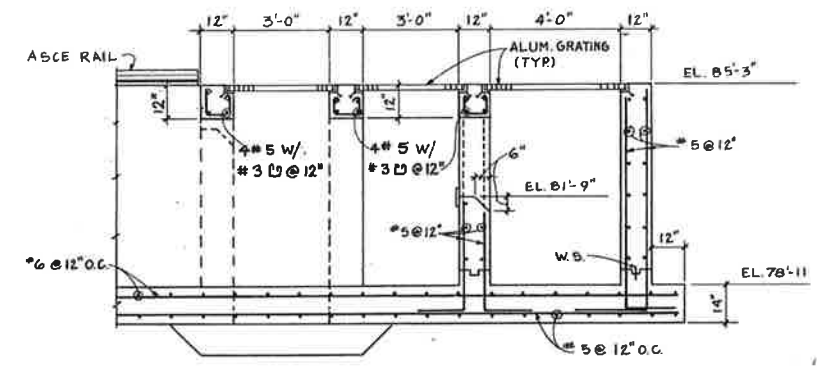
NOTE: COORDINATE MOUNTING REQUIREMENTS FOR ALL SLIDE GATES, WEIRS, PIPES AND OTHER MECH. EQUIPMENT WITH MECH. DWGS.



**SECTION 6**  
3/8" = 1'-0" S-12



**DETAIL 10**  
1" = 1'-0" S-12



**SECTION 9**  
3/8" = 1'-0" S-12

REMARKS	CHNG	DRWN	CHKD
RECORD DRAWING	ALIN	12/84	12/84
DESIGNED BY: CICO	DRAWN BY: AU	CHECKED BY: GAV	APPROVED BY: GAV
DATE: 3-14-83			

**CDM**  
CAMP DRESSER & MCKEE INC.  
ORANGE COUNTY, FLORIDA  
GRAVITY FILTERS - PLAN & DETAILS

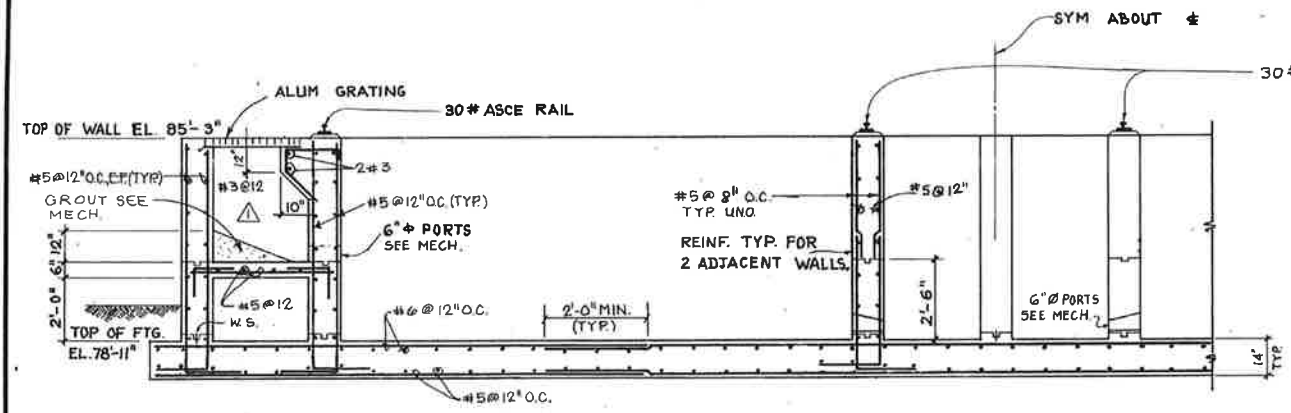
PROJECT NO. 6059-207  
SHEET NO. S-12



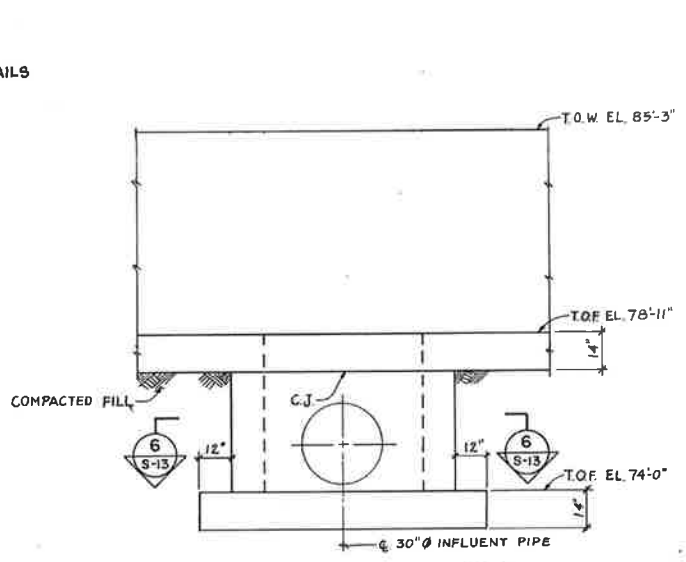
HARRINGTON, GEORGE & DUNN  
Consulting Engineers Atlanta, Georgia

RECORD DRAWING

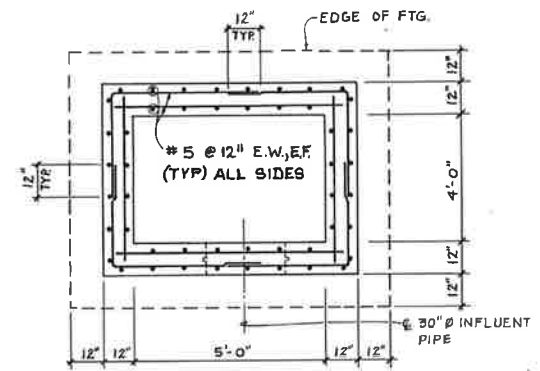




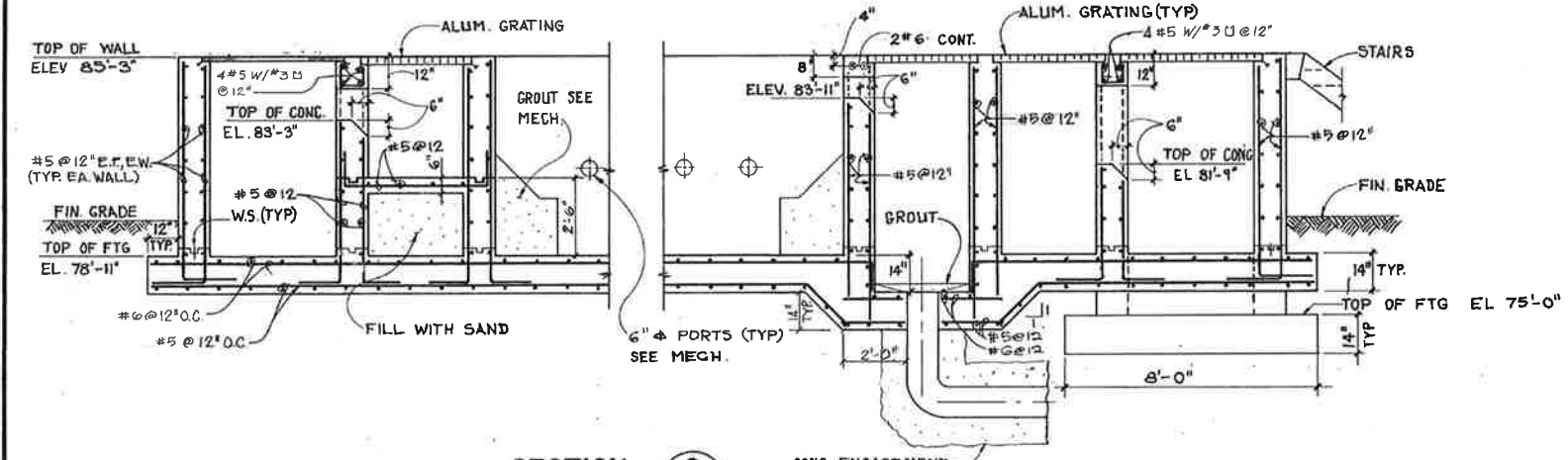
SECTION 1 S-13  
3/8" = 1'-0"



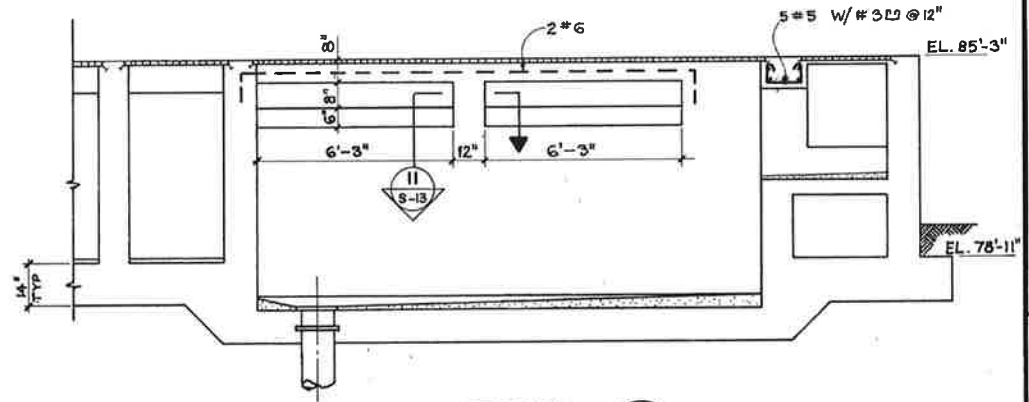
SECTION 5 S-13  
3/8" = 1'-0"



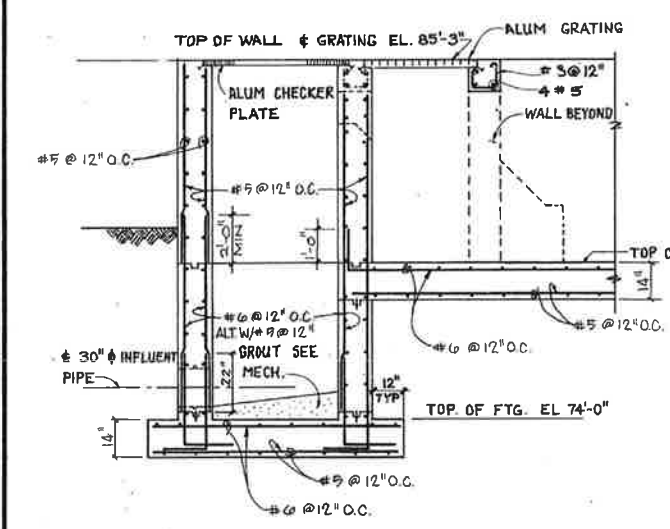
SECTION 6 S-13  
3/8" = 1'-0"



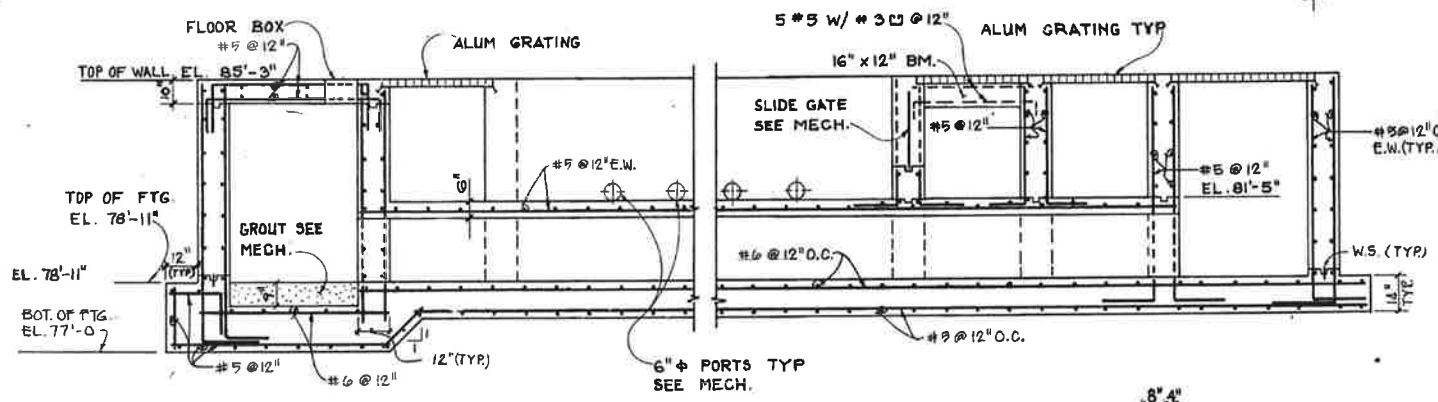
SECTION 2 S-13  
3/8" = 1'-0"



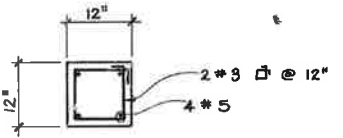
SECTION 10 S-13  
3/8" = 1'-0"



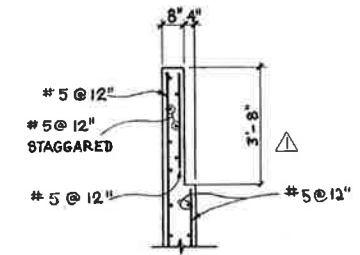
SECTION 3 S-13  
3/8" = 1'-0"



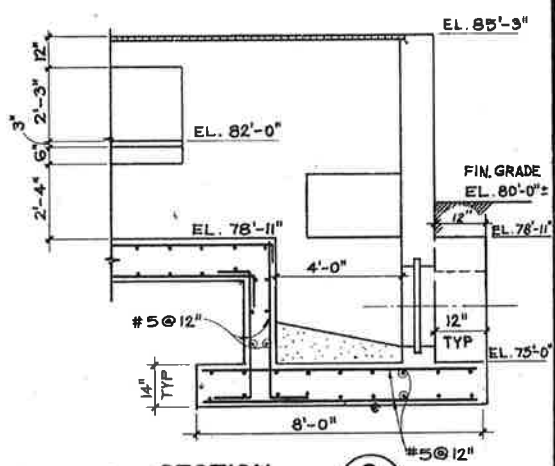
SECTION 4 S-13  
3/8" = 1'-0"



SECTION 11 S-13  
3/4" = 1'-0"



SECTION 7 S-13  
3/8" = 1'-0"



SECTION 8 S-13  
3/8" = 1'-0"



HARRINGTON, GEORGE & DUNN  
Consulting Engineers Atlanta, Georgia

REV. NO.	DATE	BY	CHKD.	REMARKS
1	JUN 85	B.K.M.		REVISED PER ADDENDUM NO. 1
2	12/84	A.L.N.		RECORD DRAWING

DESIGNED BY: S.C.C.  
 DRAWN BY: A.J.L.  
 CHECKED BY: S.V.  
 APPROVED BY: S.V.  
 DATE: 3-14-83

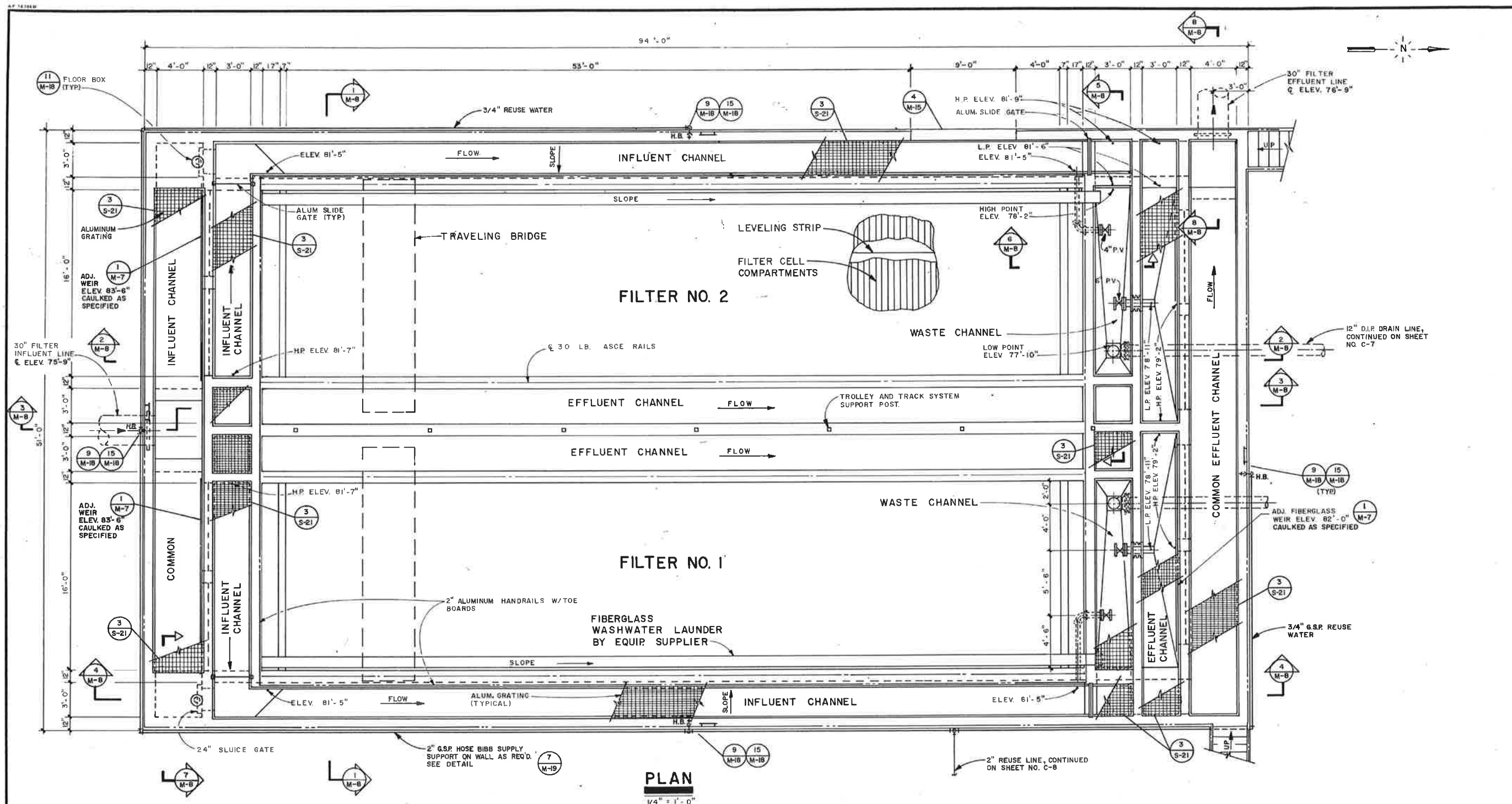
CAMP DRESSER & MCKEE INC.  
 Professional Engineers, Architects,  
 Planners, & Management Consultants

**EASTERN SUBREGIONAL WWTP-PHASE II**  
 FOR  
 ORANGE COUNTY, FLORIDA  
**GRAVITY FILTERS-SECTIONS**

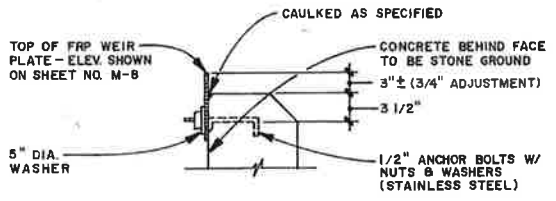
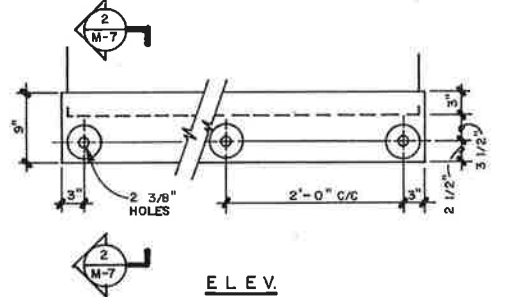
PROJECT NO.  
6059-207

SHEET NO.  
**S-13**

RECORD DRAWING



**PLAN**  
1/4" = 1'-0"



**NOTE:**  
WEIR PLATES SHOULD BE OF SUFFICIENT LENGTHS TO OVERLAP EACH END BY 2"

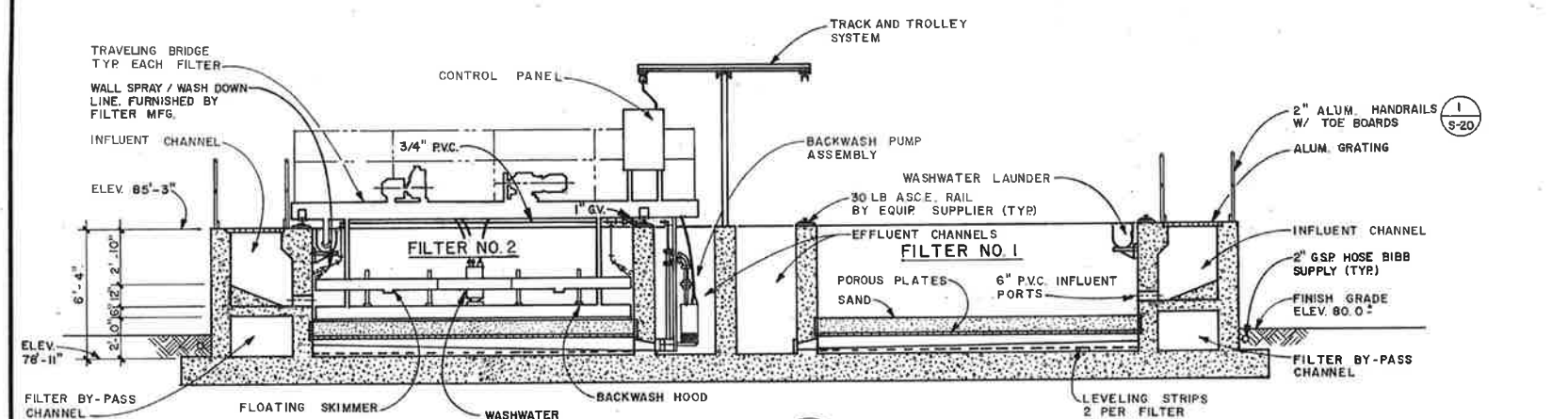
REMARKS	DESIGNED BY: E.A.H.	DATE: 12/84	CHKD: ALN
	DRAWN BY: J.P.	DATE: 12/84	ALN
	CHECKED BY: J.P.	DATE: 12/84	ALN
	APPROVED BY: J.P.	DATE: MARCH 1985	ALN
	RECORD DRAWING		

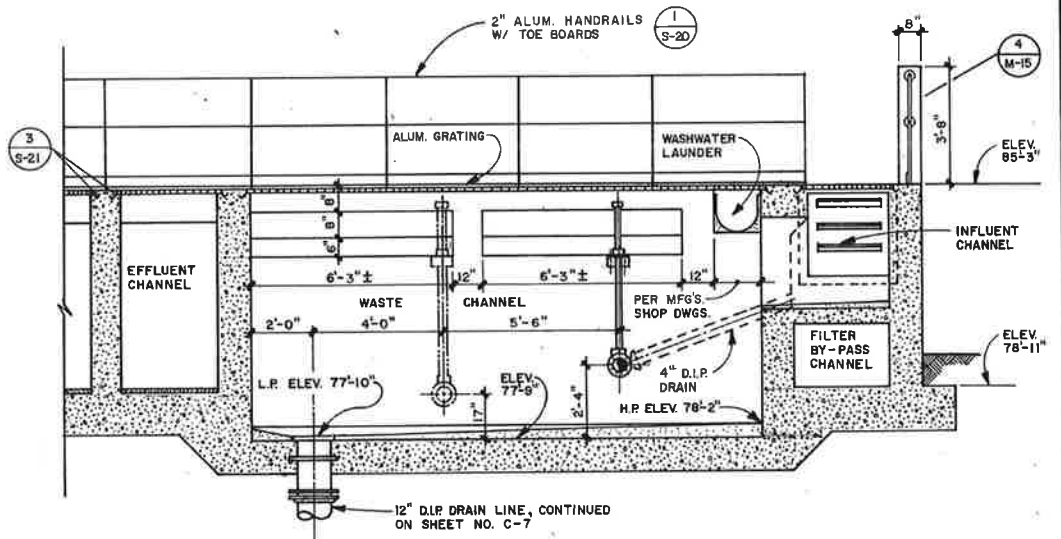
CAMP DRESSER & MCKEE INC.	
EASTERN SUBREGIONAL WWTP-PHASE II	
FOR ORANGE COUNTY, FLORIDA	
GRAVITY FILTERS-PLAN & DETAILS	
PROJECT NO.	6059-207
SHEET NO.	M-7



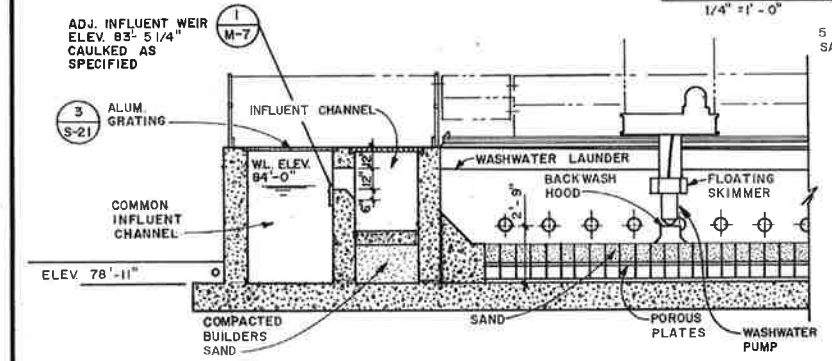
RECORD DRAWING



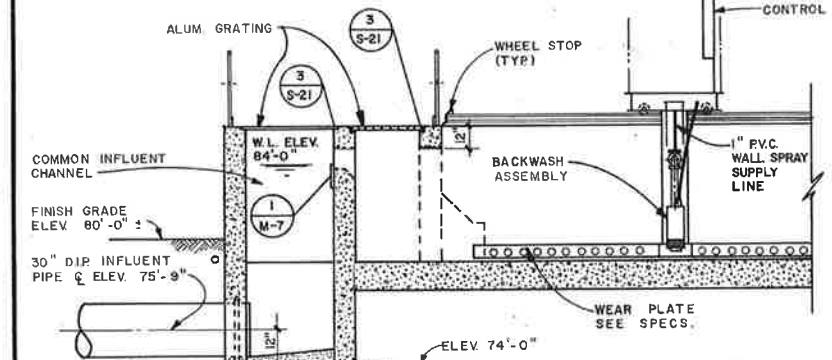
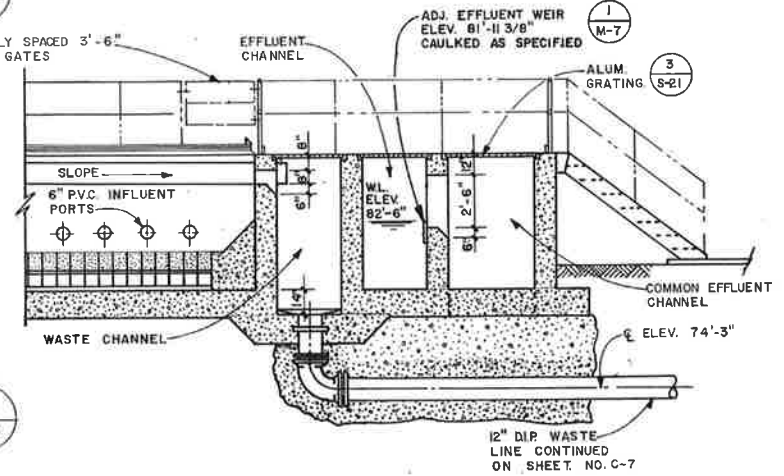
SECTION 1  
1/4" = 1'-0"  
M-8



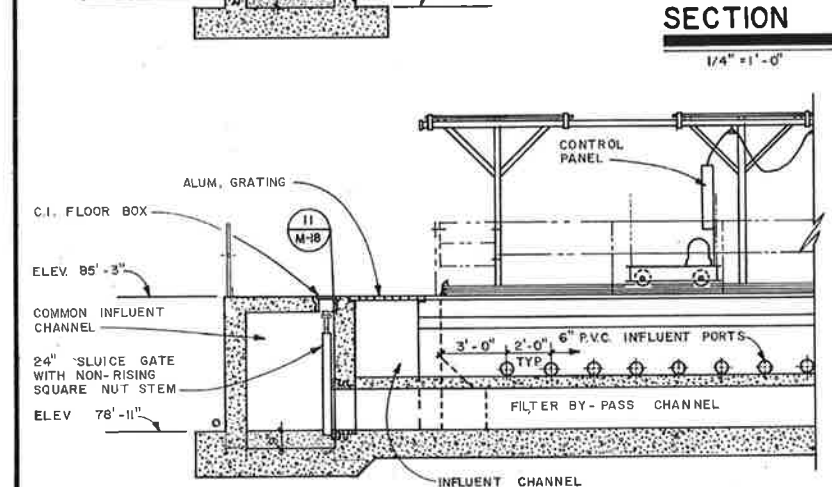
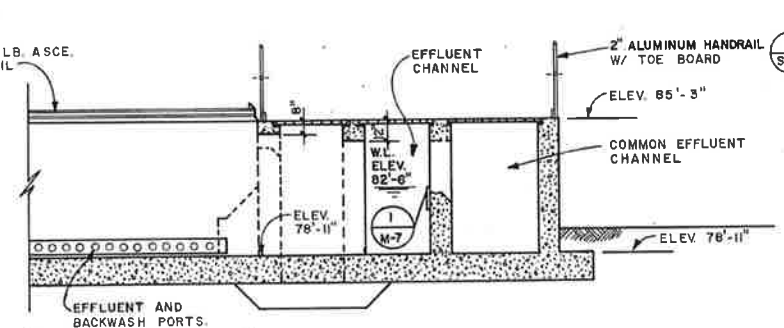
SECTION 5  
3/8" = 1'-0"  
M-8



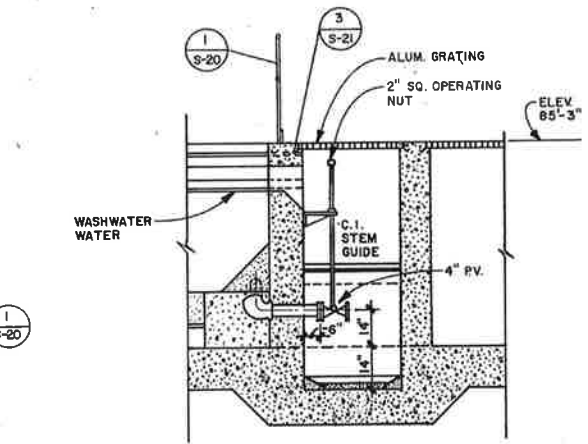
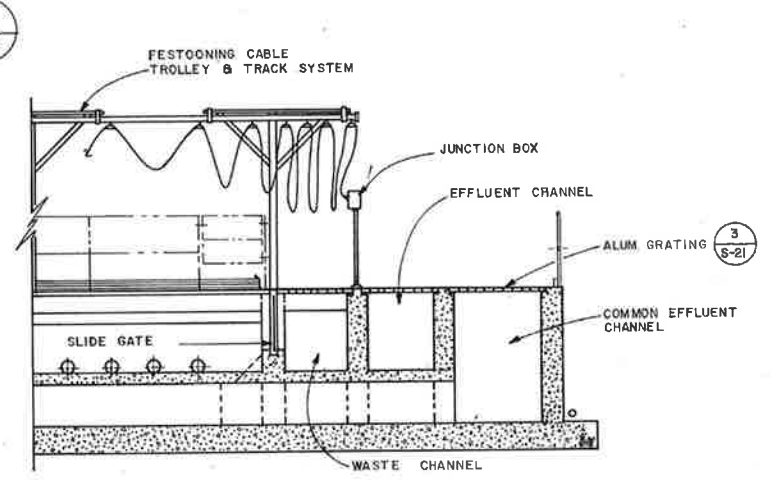
SECTION 2  
1/4" = 1'-0"  
M-8



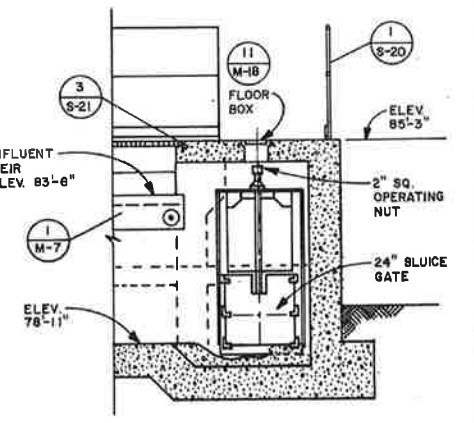
SECTION 3  
1/4" = 1'-0"  
M-8



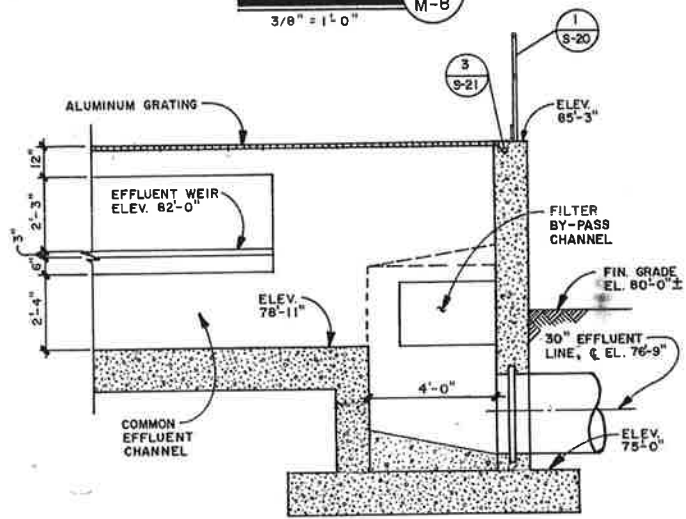
SECTION 4  
1/4" = 1'-0"  
M-8



SECTION 6  
3/8" = 1'-0"  
M-8



SECTION 7  
3/8" = 1'-0"  
M-8



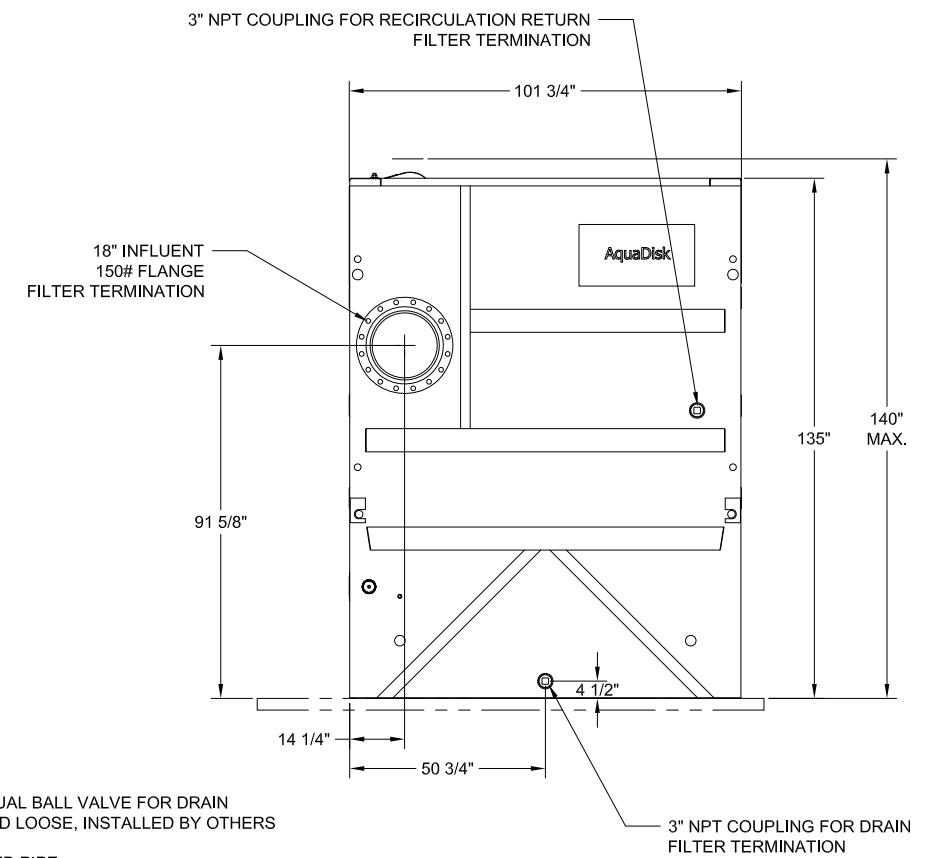
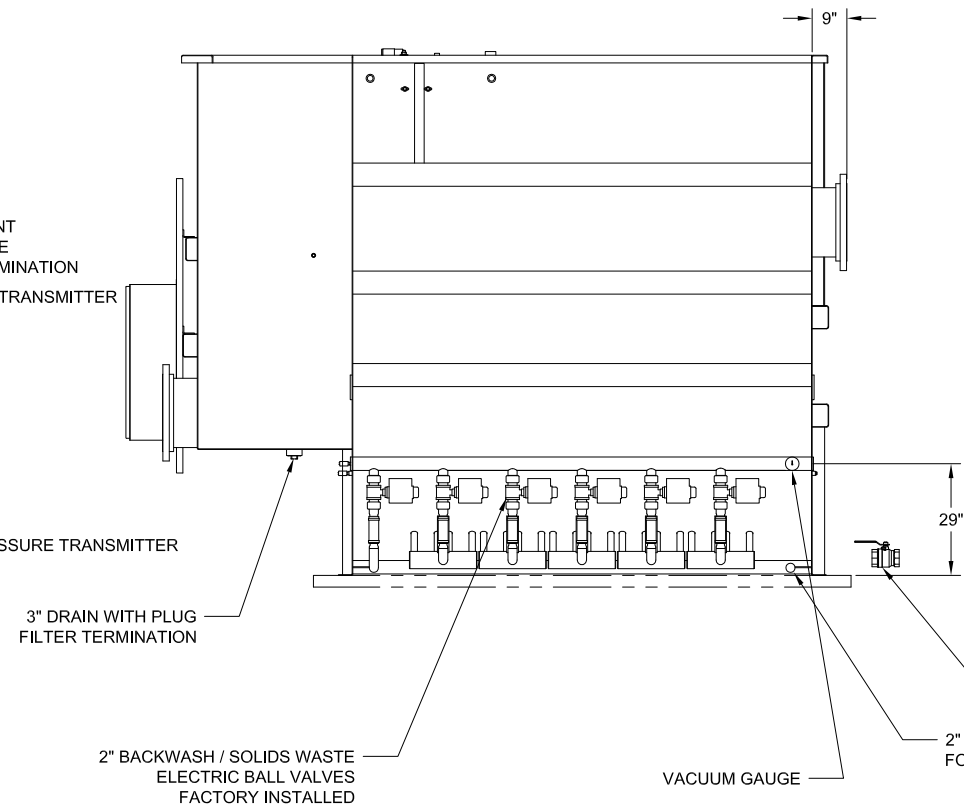
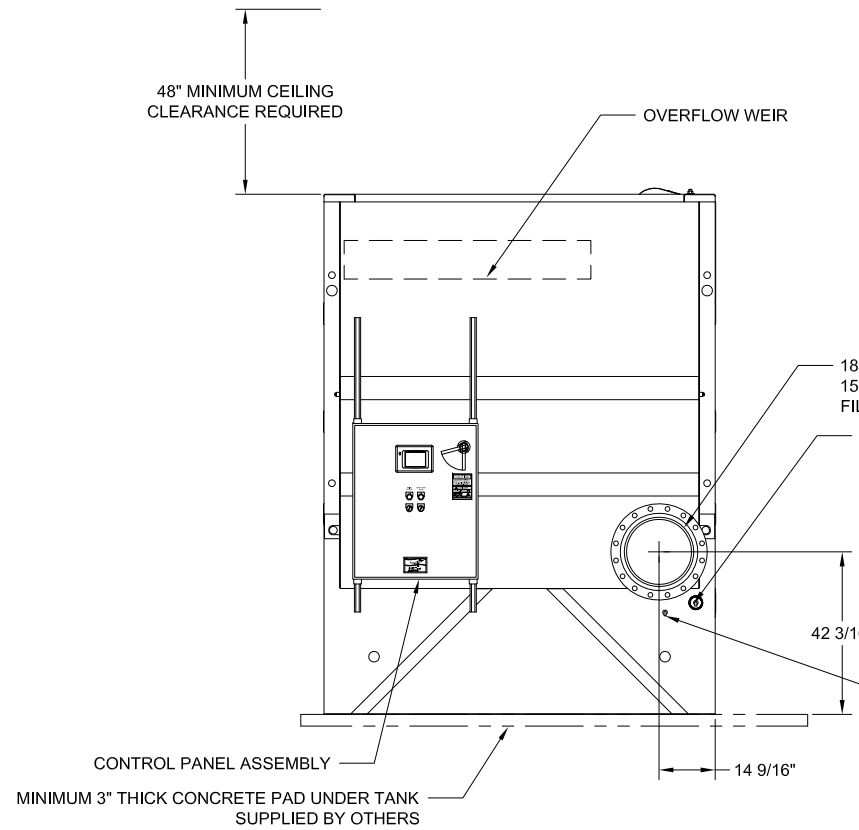
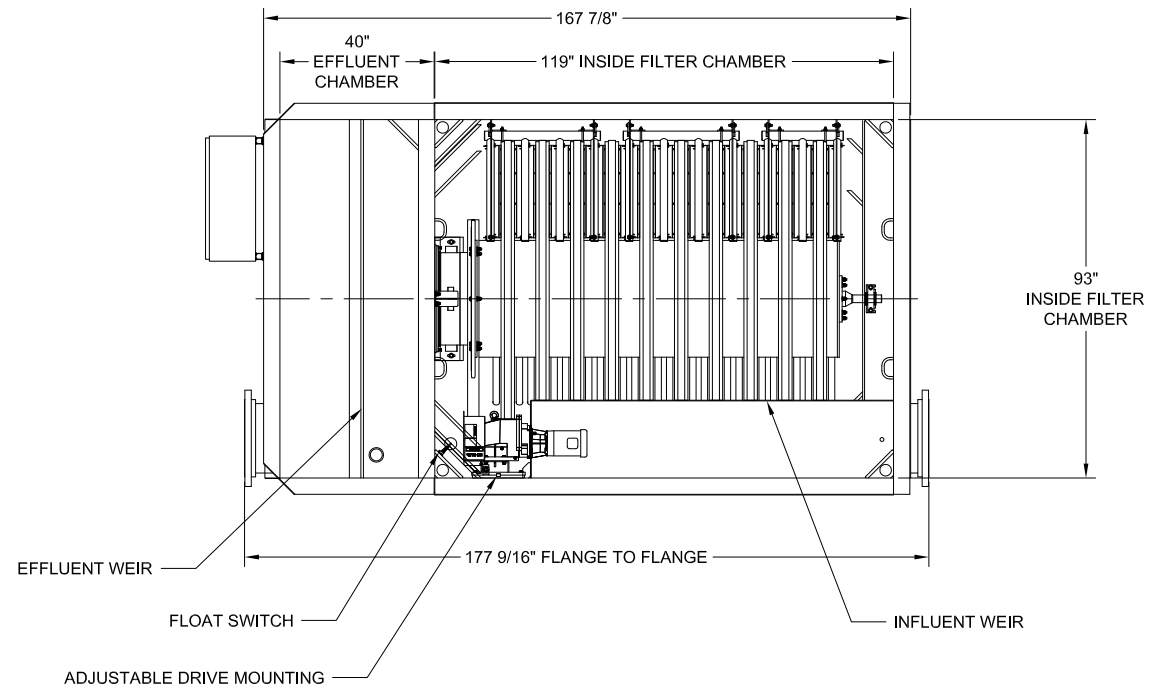
SECTION 8  
3/8" = 1'-0"  
M-8

REMARKS	
RECORD DRAWING	
REV. NO.	DATE
12/84	ALN
DESIGNED BY: E.A.H.	ALN
DRAWN BY: A.L.N.	
CHECKED BY: D. G...	
APPROVED BY: [Signature]	
DATE: MARCH 1983	
<b>CDM</b>	
CAMP DRESSER & MCKEE INC.	
EASTERN SUBREGIONAL WWTP-PHASE II FOR ORANGE COUNTY, FLORIDA GRAVITY FILTERS-SECTIONS	
PROJECT NO.	6059-207
SHEET NO.	M-8



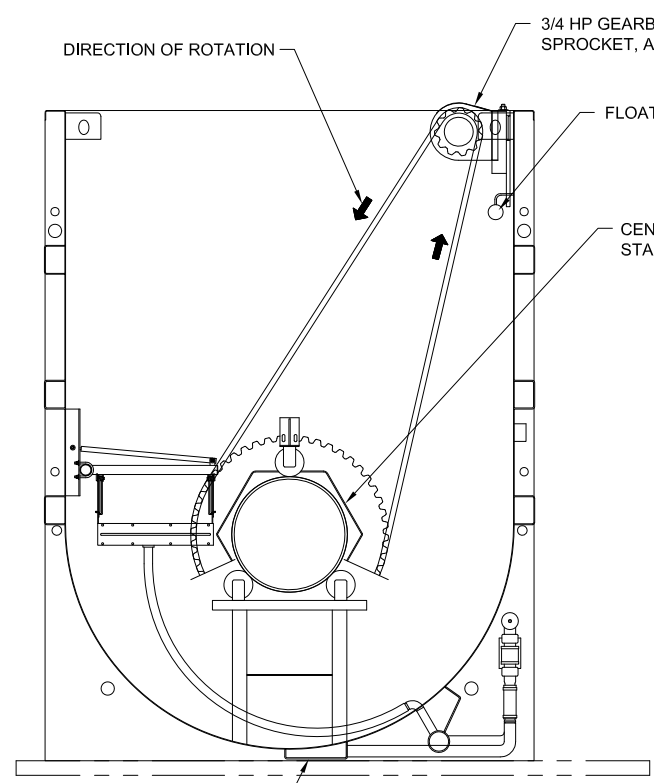
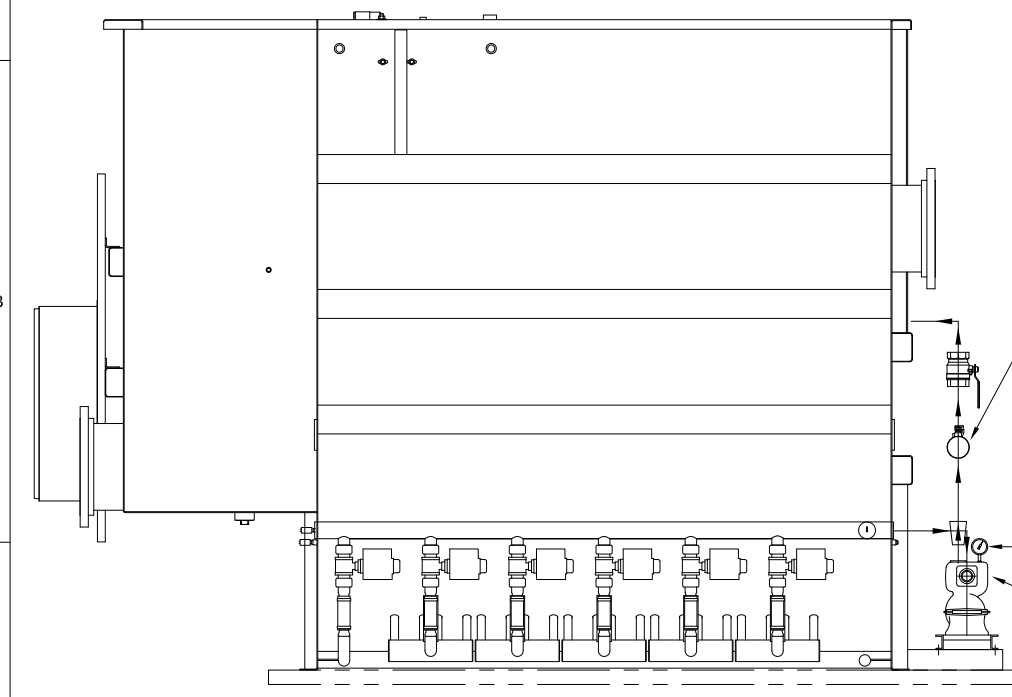
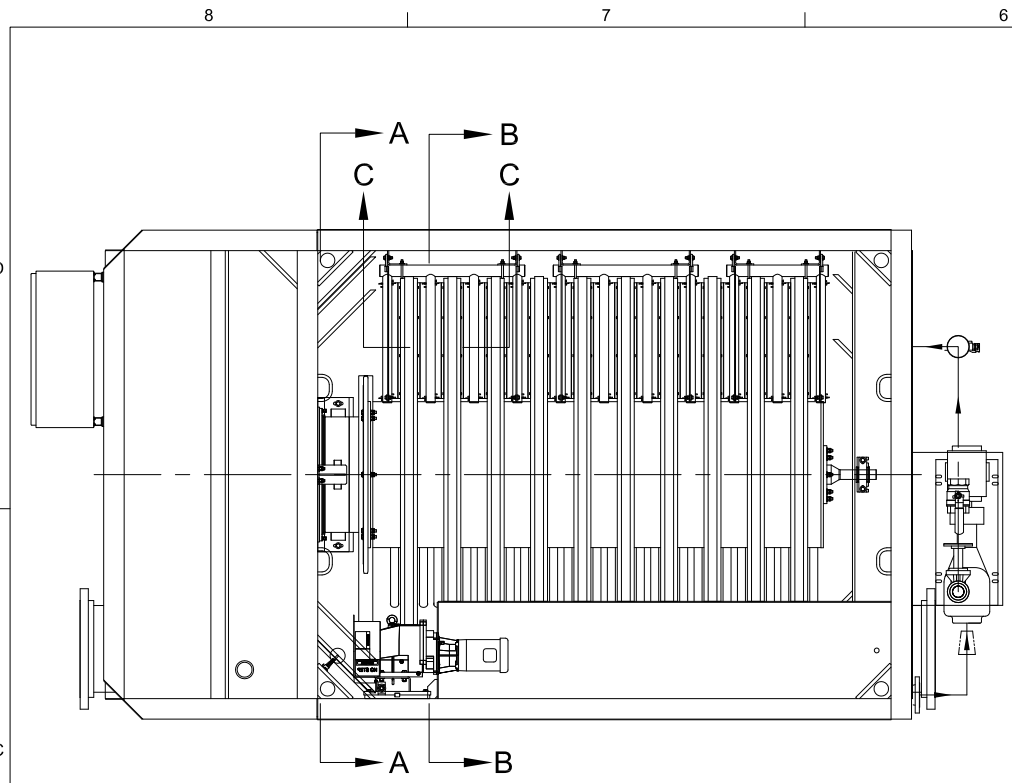
RECORD DRAWING

- 1 IF FREEZING IS A CONCERN AQUA-AEROBIC SYSTEMS RECOMMENDS THE FILTERS BE PLACED IN A HEATED BUILDING. IF A BUILDING IS NOT PROVIDED, ANY NECESSARY PROTECTION, INCLUDING BUT NOT LIMITED TO, HEAT TRACING AND INSULATION OF PUMPS AND PIPING, AS WELL AS PROTECTION AGAINST INTERNAL TANK FREEZING, SHALL BE PROVIDED BY THE INSTALLING CONTRACTOR.
- 2 THE FILTER CONTROL PANEL IS SHOWN IN THE STANDARD LOCATION. IF THE FILTER IS LOCATED OUTSIDE, THE CONTROL PANEL MAY BE RELOCATED TO THE SIDE OF THE FILTER FACING NORTH, TO LIMIT EXPOSING THE H.M.I. TO DIRECT SUNLIGHT.
- 3 THE GRAPHIC ELEMENTS OF THIS COMPUTER GENERATED DRAWING ARE DRAWN FULL SIZE. THE DIMENSIONS ARE ASSOCIATIVE. IF THE SIZE OF THE GRAPHIC ELEMENTS IS CHANGED THE DIMENSIONS WILL NOT BE CORRECT.
- 4 AN INFLUENT VALVE IS REQUIRED FOR ISOLATION / MAINTENANCE OF THE FILTER UNIT. THE INFLUENT VALVE SHALL BE PROVIDED BY OTHERS AND INSTALLED BY OTHERS.

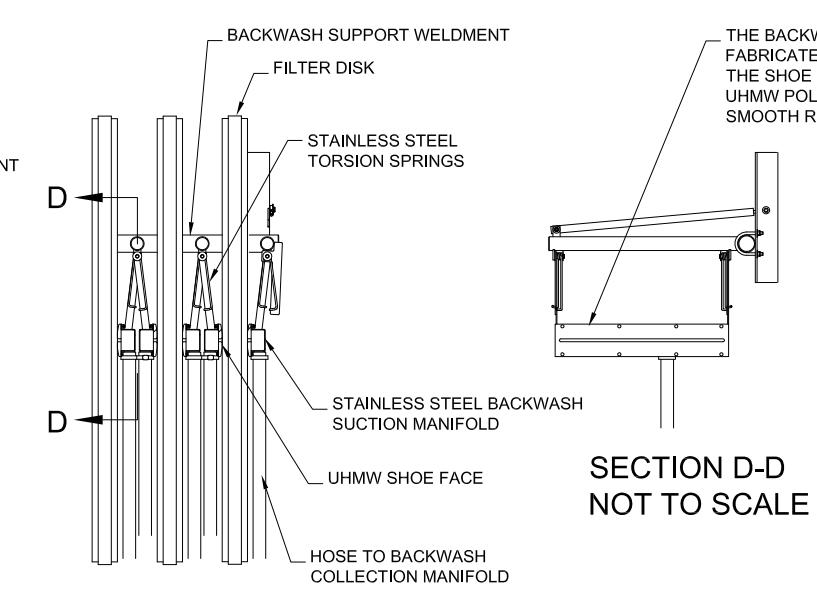


DRY WT (LBS)	OPER. WT. (LBS)
12,000	54,000

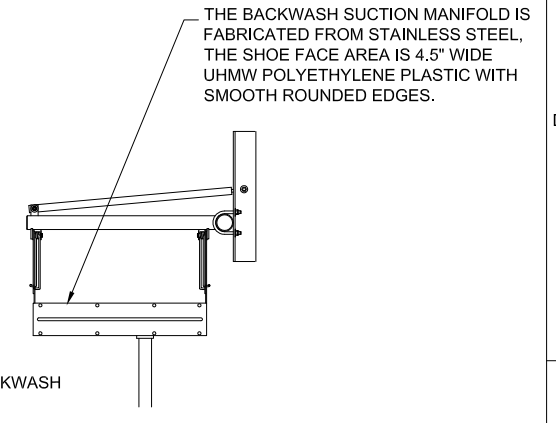
JOB NAME: ORANGE COUNTY		AQUA-AEROBIC SYSTEMS, INC.	
JOB LOCATION: FL		DO NOT SCALE DRAWING	
		UNLESS OTHERWISE SPECIFIED FRACTIONAL DIMENSIONS: 1/16" TO 1/8" ±0.015 ALL TWO PLACE DECIMALS: ±0.015 ALL THREE PLACE DECIMALS: ±0.005 ALL ANGLES: ±12'	
		ANSI	
		MATERIAL:	
		SIMILAR TO:	
		TYPE:	
		DRAWN BY: SLT DATE: 2014-7-31	
		CHECKED BY: DATE:	
REV		ERN / ECO	DATE
		BY	REVISION DESCRIPTION
		WEIGHT:	SHEET: 1 OF
DRAWING NAME:		DRAWING NUMBER:	SCALE: SIZE: D
AQUADISK FILTER MODEL ADFSP-54 X 10E-PC - LH		8103295K6005	



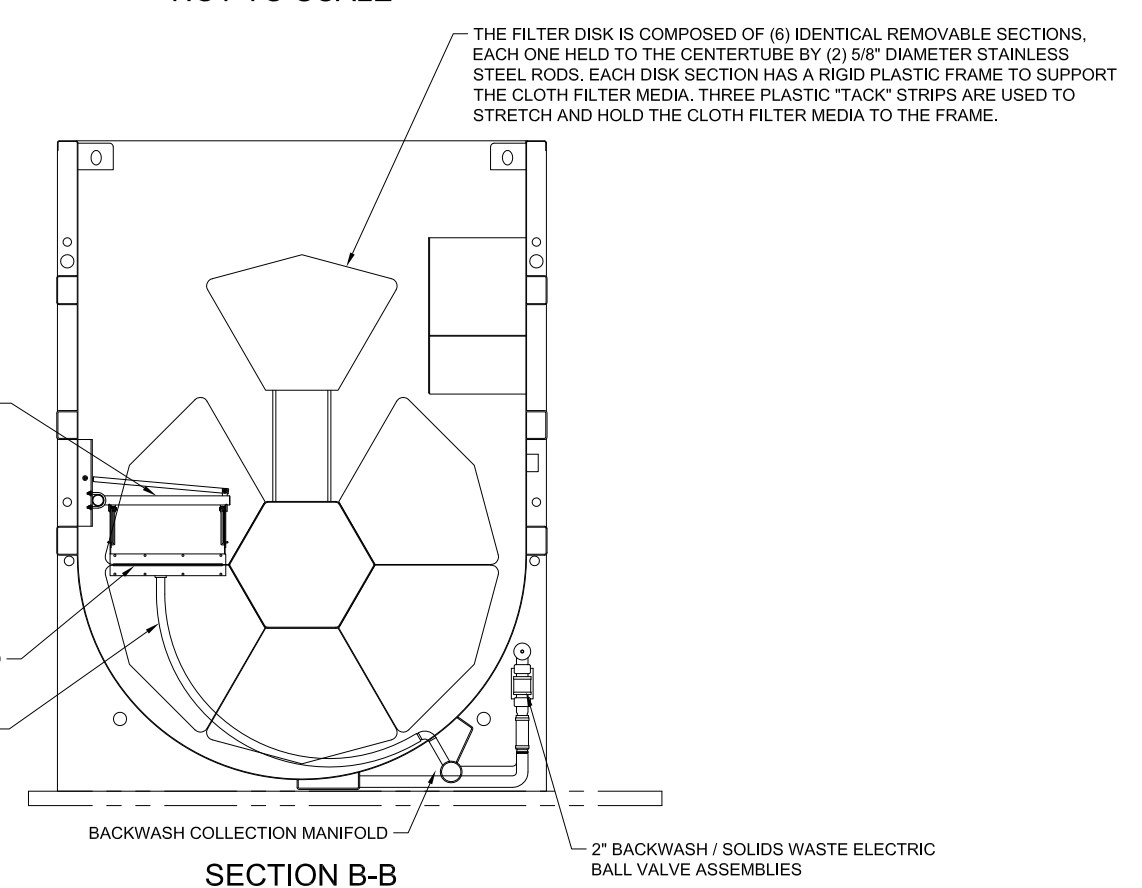
SECTION A-A



SECTION C-C  
NOT TO SCALE

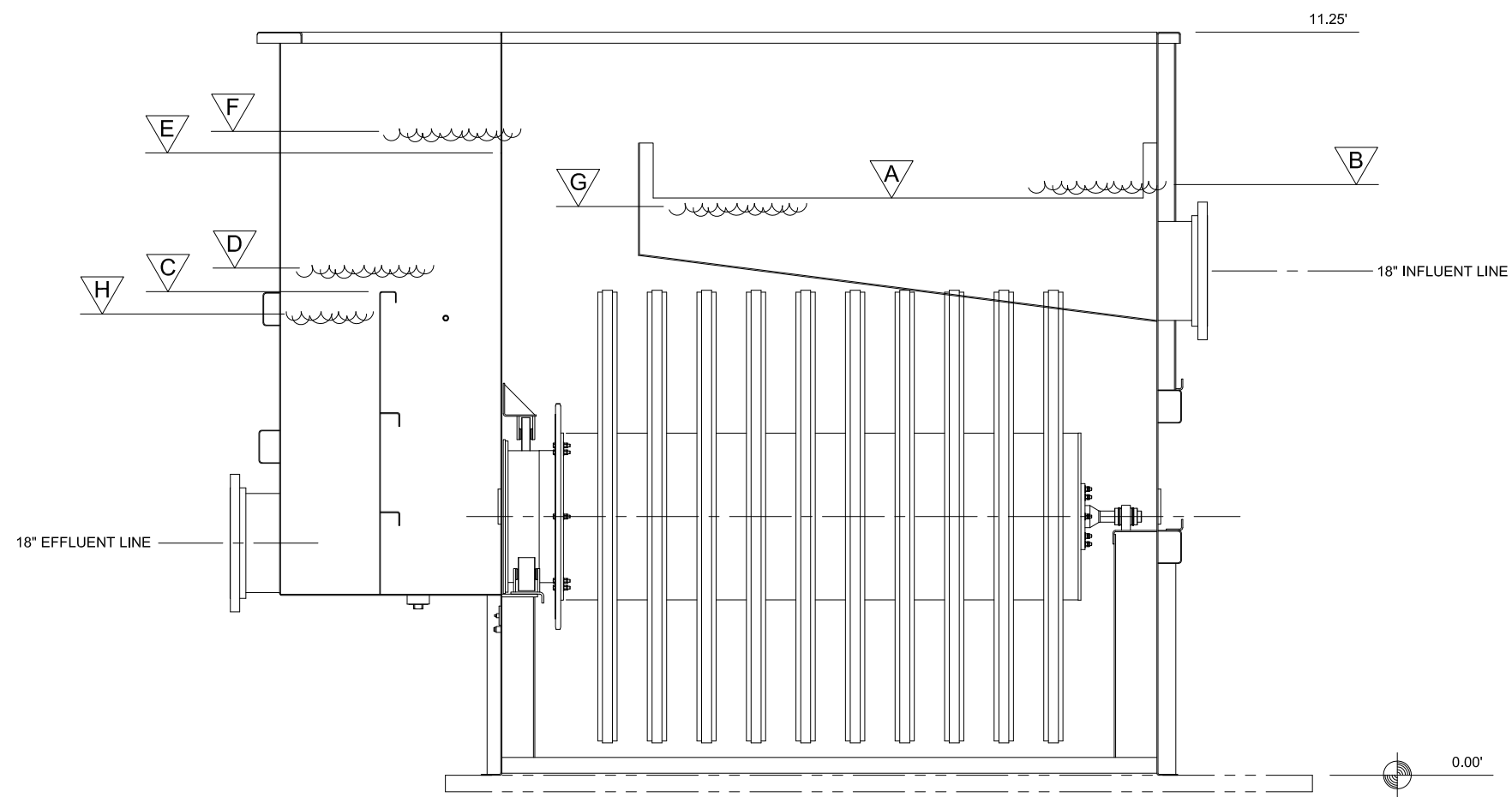


SECTION D-D  
NOT TO SCALE



SECTION B-B

JOB NAME: ORANGE COUNTY		AQUA-AEROBIC SYSTEMS, INC.	
JOB LOCATION: FL		<small>DO NOT SCALE DRAWING</small>	
		<small>UNLESS OTHERWISE SPECIFIED</small> <small>FRACTIONAL DIMENSIONS -- 1/16"</small> <small>ALL TWO PLACE DECIMALS -- 0.015"</small> <small>ALL THREE PLACE DECIMALS -- 0.005"</small> <small>ALL ANGLES -- 12"</small>	
MATERIAL:		ANSI	
SIMILAR TO:			
TYPE:			
DRAWN BY: SLT		DATE: 2014-7-31	
CHECKED BY:		DATE:	
WEIGHT:		SHEET: 1 OF	
DRAWING NUMBER:		SCALE: SIZE: D	
AQUADISK FILTER MODEL ADFSP-54 X 10E-PC - LH		8103295K6006	















**ELEVATION**

<b>A</b>	8.74'	INFLUENT WEIR ELEVATION
<b>B</b>	9.03'	NAPPE OVER INFLUENT WEIR AVERAGE FLOW
	9.20'	NAPPE OVER INFLUENT WEIR MAXIMUM FLOW
<b>C</b>	7.32'	EFFLUENT WEIR ELEVATION
<b>D</b>	7.60'	NAPPE OVER EFFLUENT WEIR AVERAGE FLOW
	7.77'	NAPPE OVER EFFLUENT WEIR MAXIMUM FLOW
<b>E</b>	9.42'	OVERFLOW WEIR ELEVATION
<b>F</b>	9.78'	NAPPE OVER OVERFLOW WEIR AVERAGE FLOW
	9.99'	NAPPE OVER OVERFLOW WEIR MAXIMUM FLOW
<b>G</b>	8.70'	BACKWASH INITIATE LEVEL
<b>H</b>	6.82'	MAXIMUM AVAILABLE LIQUID LEVEL FOR EFFLUENT CONVEYANCE

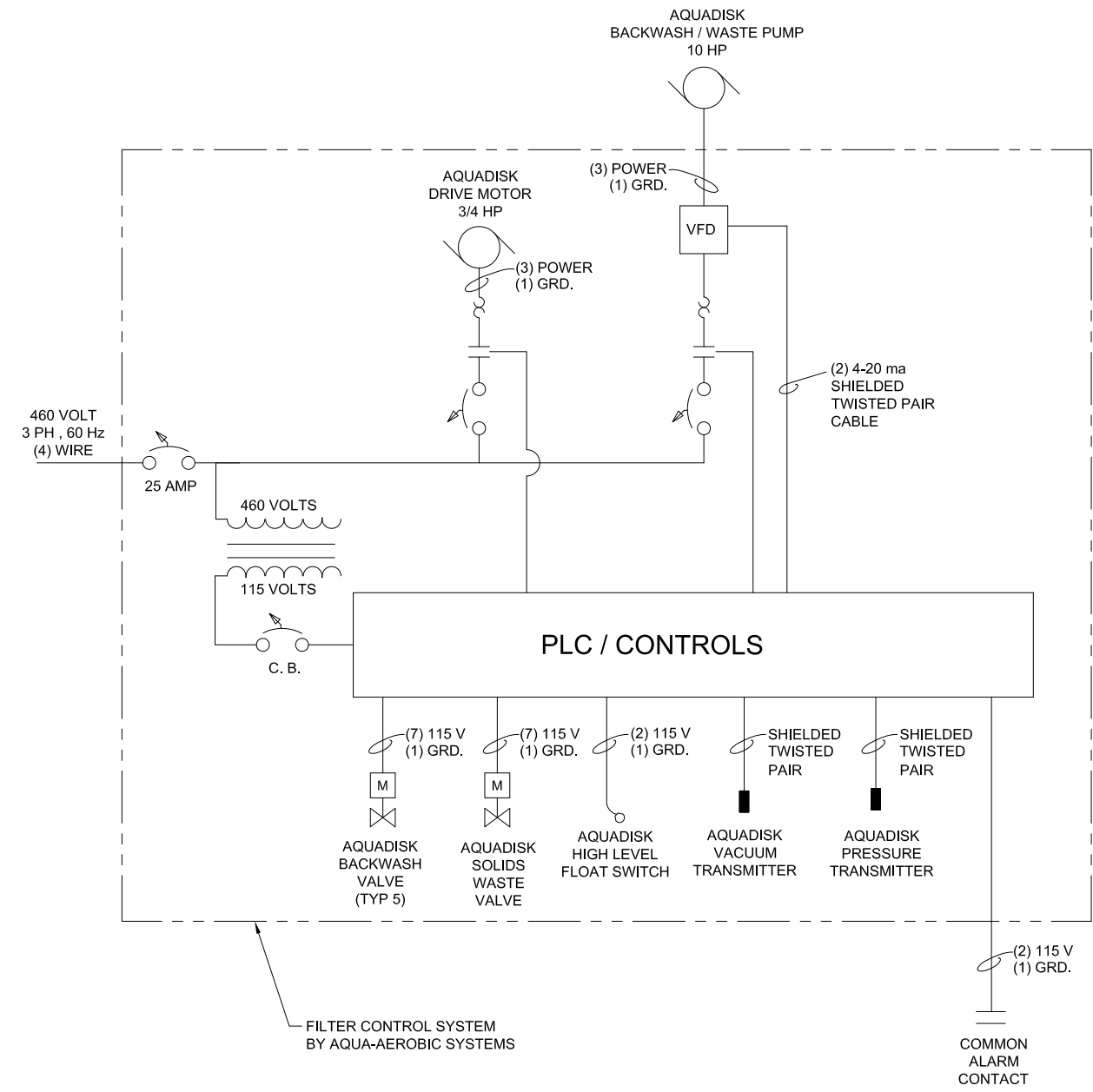
**HYDRAULIC PROFILE**  
 BASED UPON AVERAGE FLOW RATE OF 3.25 GPM PER SQUARE FOOT (2.5 MGD)  
 BASED UPON MAXIMUM FLOW RATE OF 6.5 GPM PER SQUARE FOOT (5.0 MGD)

**WEIR LENGTHS**  
 INFLUENT = 7.42'  
 EFFLUENT = 7.75'  
 OVERFLOW = 5.33'

JOB NAME: ORANGE COUNTY		AQUA-AEROBIC SYSTEMS, INC.	
JOB LOCATION: FL		UNLESS OTHERWISE SPECIFIED	
		FRAC TIONAL DIMENSIONS: 1/16"	
		ALL TWO PLACE DECIMALS: 1/32"	
		ALL THREE PLACE DECIMALS: 1/64"	
		ALL ANGLES: 1/2"	
		ANSI	
MATERIAL:			
SIMILAR TO:			
TYPE:			
DRAWN BY: SLT		DATE: 2014-7-31	
CHECKED BY:		DATE:	
WEIGHT:		SHEET: 1 OF	
DRAWING NAME:		DRAWING NUMBER:	
AQUADISK FILTER MODEL ADFSP-54 X 10E-PC - LH		813295K6007	
		SCALE: D	



SYMBOL KEY											
	MOTOR		CIRCUIT BREAKER		ELECTRICAL DISCONNECT		VARIABLE FREQUENCY DRIVE		TRANSDUCER		STARTER CONTACTOR
	MOTOR OPERATED VALVE		TRANSFORMER		MOTOR OVERLOAD		PNEUMATIC OPERATED VALVE		FUSE		FLOAT SWITCH

NOTE: SOME SYMBOLS MAY NOT BE APPLICABLE



**1** CONTROL PANEL  
ENCLOSURE NEMA 4X WALL MOUNTED TYPE STAINLESS STEEL  
FACTORY ASSEMBLED ON THE FILTER, DISASSEMBLED AND SHIPPED LOOSE.  
REASSEMBLED ON-SITE BY CONTRACTOR.  
IF THE FILTER IS LOCATED OUTSIDE, THE CONTROL PANEL  
MAY BE RELOCATED TO THE SIDE OF THE FILTER  
FACING NORTH TO LIMIT THE H.M.I. EXPOSURE TO DIRECT SUNLIGHT.

**2** (1) CONTROL PANEL PER FILTER

JOB NAME: ORANGE COUNTY			AQUA-AEROBIC SYSTEMS, INC.	
JOB LOCATION: FL			DO NOT SCALE DRAWING	
		UNLESS OTHERWISE SPECIFIED		
		FRACTIONAL DIMENSIONS: 1/16" TO 1/8" ±0.015"		
		ALL TWO PLACE DECIMALS: ±0.015"		
		ALL THREE PLACE DECIMALS: ±0.005"		
		ALL ANGLES: ±12"		
		MATERIAL:		
		SIMILAR TO:		
		TYPE:		
		DRAWN BY: SLT		DATE: 2014-7-31
		CHECKED BY:		DATE:
REV	ERN / ECO	DATE	BY	REVISION DESCRIPTION
		WEIGHT:		SHEET: 1 OF
DRAWING NAME:		DRAWING NUMBER:		SCALE: SIZE:
AQUADISK FILTER MODEL ADFSP-54 X 10E-PC - LH		8103295K6008		D