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| Version | Date | Description of Revisions |
| 1 | August 30, 2006 | Approved final document. |
| 2 | September 30, 2009 | Review/update of the document related sections and insertion of pre-approved suppliers’/manufacturers’ names |
| 3 | April 22, 2013 | Final Draft – Consolidated Comments Spec Update Project |
| 4 | June 17, 2013 | Finalized for Legal Review. Incorporation of new Commissioning and Computerized Maintenance Management System Data Requirements Specification cross references. |
| 5 | May 27, 2014 | Final draft incorporating Legal’s comments (AV) |
| 6 | July 15, 2014 | Amended to reflect changes related to commissioning specification and name change (AV) |
| 8 | September 24, 2014 | Updated, Finalized Specification – Reference eDOCS #1029457-v5 (AV) |
| 9 | February 18, 2015 | Updated standards (AV) |
| **10** | **March 2, 2015** | **Updated, Finalized Specification – Legal Reference eDOCS #5043359 v12 (AV)** |
| 11 | February 15, 2017 | Updated the Acceptable Manufacturers list (CPD PMO, OMM) (AV) |

NOTE:

This is a CONTROLLED Document. Any documents appearing in paper form are not controlled and should be checked against the on-line file version prior to use.

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**The on-line copy is the current version of the document.**

# GEneral

## Scope of Work

### The work of this Section covers the work necessary to completely furnish and install the stationary automatic samplers specified in this Section.

## Related Sections

### *[Under "Related Sections", identify other Sections that are related to, and/or dependent on, the work results or information specified elsewhere. The list should be limited to Sections with specific information that the reader might expect to find in this Section, but is specified elsewhere. For example, if hardware for aluminum entrances is specified in the aluminum entrance Section, a cross-reference would be appropriate in the finish hardware Section. The purpose of this cross-referencing is for information only, to aid in finding those other requirements—not to define the scope of the Section.*

### *Cross-referencing here may also be used to coordinate assemblies or systems whose components may span multiple Sections and which must meet certain performance requirements as an assembly or system.*

### *This Section is to be completed/updated during the design development by the Consultant. If it is not applicable to the section for the specific project it may be deleted.]*

### *[List Sections specifying installation of products supplied but not installed under this Section and indicate specific items.]*

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: Execution requirements for ...[item]... specified under this Section.

### *[List Sections specifying products installed but not supplied under this Section and indicate specific items.]*

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: Product requirements for ...[item]... for installation under this Section.

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: [Optional short phrase indicating relationship].

#### Section 01060 – Regulatory Requirements

#### Section 01425 – Computerized Maintenance Management System Data Requirements

#### Section 01430 – Operation and Maintenance Data

#### Section 01600 – Material and Equipment

#### Section 01640 – Manufacturer’s Services

#### Section 01810 - Equipment Testing and Facility Commissioning

#### Section 09900 – Painting and Protective Coating

#### Section 11010 – Equipment General Requirements

#### Section 13390 – Package Control Systems

#### [Division 13 SCADA and Instrumentation – insert applicable specifications]

#### Design Guidelines Section 17 – Operation Manual Guideline

#### Product requirements for [item]... for installation under this Section.

## References

### Comply with the latest edition of the following codes and standards, and all amendments thereto:

#### National Electrical Manufacturer’s Association (NEMA): 250-2014, Enclosures for Electrical Equipment (1,000 Volts Maximum).

## Submittals

### General: Administrative, shop drawings, samples, quality control and submittal shall conform to the requirements of Section 01300 - Submittals.

### Shop Drawings:

#### Complete manufacturer's descriptive information and shop drawings for all equipment, material, and devices furnished, including the dimensions, size, and weight of equipment and all other required information as detailed in the equipment information template. The information shall be in an electronic format suitable for upload to the Region’s CMMS (Maximo). Refer to Section 01425 - Computerized Maintenance Management System Data Requirements.

#### Functional description of internal and external instrumentation and controls supplied, including a list of parameters monitored, controlled, and alarmed.

#### Samples: Manufacturer’s standard colour samples for equipment enclosures.

#### Information on proposed factory-applied coating system that is suitable for the environment specified.

### Quality Control:

#### Manufacturer’s Certificate of Proper Installation.

#### Manufacturer’s installation instructions.

#### Proposed operation and maintenance manual, including maintenance summary sheets for equipment, in an electronic format suitable for upload to the Region’s CMMS (Maximo).

#### Written test reports of each inspection for equipment.

#### Operation and Maintenance Manual as specified in Section 01430 - Operation and Maintenance Data.

#### Data to be provided as required by Design Guidelines Section 17 – Operation Manual Guideline.

## Extra Materials

### Provide the following spare parts as a minimum per each sampler unit:

|  |  |
| --- | --- |
| Item | Quantity |
| Bottles | 1 per sampler |
| Metering Pump Hose | 4 per sampler |

### Delivery: In accordance with Section 01600 - Material and Equipment.

### For potable water applications the hose material must be approved by the Consultant.

# PRODUCTS

## General

### Each sampler shall be heavy duty, automatic, sequential and composite, peristaltic type.

### Collected samples shall be stored in an integral refrigeration system.

### Each sampler capable shall be capable of taking an adjustable sample, from 50 to 1,000 ml for each cycle with repeatability of plus or minus 5 ml.

### Refrigerated compartment shall be capable of maintaining temperature of -16.7°C (4°F) when ambient outdoor temperature is 49°C (120°F).

### Each unit shall be supplied with a heater and thermostat capable of maintaining the temperature above 0°C (32°F) when ambient temperature is -29°C (-20°F).

### Electrical Equipment:

#### Operate on 120 volt, 60 Hz, single phase power.

#### Provide junction boxes on the back side of each sampler for field connection.

#### Controls and pump mounted in outdoor enclosures in accordance with NEMA 4X.

#### Provision of a GFI protected power cable for safety.

### Sample container shall be provided with a capacitance type or float switch level sensor. When the container is full, the sampler shall automatically shut-off, activate an integral sample full alarm light and dry contact relay alarm.

### All materials which may come into contact with the sample shall be corrosion resistant.

## Acceptable Manufacturers

### Materials, equipment, and accessories specified in this Section shall be products of one of the following manufacturers:

#### Avensys (ISCO).

#### Hach Company, Inc. (American Sigma)

#### Approved Equivalent.

## Service Conditions

### Tag Number, Location, Service, and Sampling Line Pressure:

|  |  |  |  |
| --- | --- | --- | --- |
| Tag Numbers | Location | Stream | Stream Pressure |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

## Design Requirements

### Provide each sampler unit in a self-contained, fibreglass, freestanding cabinet, complete with internal controls, sampler, and an adjustable temperature refrigerator of a suitable size to hold sample container.

### Cabinet doors, for both control and refrigerated compartments, shall be hinged to open in same direction. Refrigerator enclosure shall be made of stainless steel or fibreglass.

### Full paneled front shall include a foot cover plate.

### Each sampler shall be suitable for mounting on a level concrete base.

### Each unit shall be supplied with an insulated fibreglass outdoor enclosure with a UV resistant gel coat.

### Enclosure:

#### Front opening and/or top cover door with lock and stainless steel hinge.

#### Provided with vent louvers to allow adequate ventilation for the refrigerator.

#### Suitable for mounting on a level concrete base with 10mm (3/8 inch) minimum diameter stainless steel anchor bolts.

### Each sampler shall be suitable for side by side mounting.

### Supply each sampler with two sets of sample containers.

### Size of Suction Line: Inside diameter [     ] mm ([     ] inches).

### Transport Velocity: Minimum 0.6 m/s at 1.5m of head (2.0 feet per second at 5 feet of head).

### Number of Process Flows Sampled: One.

### Refrigerator Capacity: One collection jar.

### Sample Collection Jar Capacity: [     ] L.

### Size of Solids Sampled: [     ] mm ([     ] inches) maximum.

### Sampler shall be capable of lifting a clean water sample [     ] m ([     ] feet).

### Length of Suction Line Required: [     ] m ([     ] feet) per sampler.

### To sample from a pressurized >[     ] kPa (>[     ] psi) pipe or other source, a flow-through cell will be used to open the stream to atmospheric pressure.

#### The flow-through cell will be integral to the sampler. The flow through cell will be adjusted to no less than [     ] L/min ([     ] gpm) and no more than [     ] L/min ([     ] gpm). The unused sample flow shall be piped to a sump.

#### A pressure-reducing valve must be installed if the flow cannot be reduced sufficiently by means of the ball valve. Pressure reducing valve to be type [Plast-O-Matic Model PR200BPV], or an Approved Equivalent.

## Controls

### All instrumentation and controls work of this Section shall be in accordance with the requirements of Section 13390 - Package Control Systems. Provide all items, including items not specifically called out that are required to implement the specified functions and the functions required for proper system operation.

### The control panel shall be mounted to the sampler unit.

### Operator Controls and Indicators: At a minimum, provide the following functions on the face of the control panel.

#### Control Functions:

##### ON/OFF.

##### TIMER/FLOWMETER Mode Selection.

##### Initiate SAMPLE.

#### Alarm Indicating Lights: SAMPLE FULL.

#### Indication:

##### TIMER mode.

##### SAMPLING or SAMPLING COMPLETE.

##### Power ON.

#### Other Panel Devices: Sample Control Timer.

### Functional Requirements:

#### Completely programmable from the controller faceplate.

#### Indication of sampler operation and operating parameters.

#### Programmable functions shall include, but not be limited to, the following:

##### Automatic Shutoff Setpoint: 1 through 9,999 minutes or 24 through 288 samples.

##### Contact Closure Setpoint: 1 through 9,999 counts.

##### Constant Sampling Interval: 1 through 60 minutes.

##### Variable Sampling Interval: 1 through 180 counts per hour.

##### Adjustable Timer/Counter.

#### FLOW Mode: Sampler shall base sampling frequency proportional to flow.

#### TIMER Mode: Sampler shall base sampling frequency on a pre-set number of samples and a pre-set time interval.

#### REMOTE Mode: Sampler shall sample when instructed by a remote signal.

### External Interfaces: Provide the following external interfaces to other equipment not provided under this Section:

#### Discrete Outputs from the sampler control panel to the plant control system PLC: Provide the following contact closure outputs for each sampler. Contacts shall be rated for 2A, at 120V ac.

##### Sampler ON.

##### ALARM.

#### Analogue Inputs from the plant control system PLC: Accept a 4 to 20 mA dc input that will correspond to a flow signal from the PLC system.

#### Discrete input from the plant control system PLC to initiate a sampling cycle.

### Power Requirements: The panel(s) shall operate from a single 120-volt, single phase power source.

### Error messages that shall be part of the automatic composite sampler device alarming features:

#### Power failed.

#### Refrigerator temperature failure.

#### User stopped.

#### No liquid detected.

#### Pump latch open.

#### Bottle full.

#### Sample already in progress.

#### As defined by the Consultant, appropriate I/O to the PAC and SCADA systems in accordance with the requirements of Division 13 – SCADA and Instrumentation.

## Accessories

### Strainers: Sampling lines submerged in channels shall be provided with an all stainless steel strainer for a 10mm (3/8 inch) line.

### Lifting Lugs: Equipment weighing over 45.5kg (100 pounds) shall be furnished with lifting lugs to permit easy handling.

### Equipment Identification Plates:

#### Furnish a laminated plastic identification plate, securely mounted on the front of each sampler in a readily visible location.

#### Plate shall indicate in 12mm (0.5 inch) laminated or die stamped letters the process flow being sampled and the equipment tag number.

### Control Nameplates: Engraved laminated plastic nameplates, clearly describing the function of each switch, pushbutton, timer, and other devices on the sampler instrument panel.

## Shop Fabrication

### Prepare, prime, and finish coat in accordance with Section 09900 – Painting and Protective Coating, or as approved by the Consultant.

### Fibreglass color shall be white or gray.

# EXECUTION

## Installation

### Install equipment in accordance with the manufacturer’s instructions, as shown on the Contract Drawings, or as approved by the Consultant.

## Field Quality Control

### Functional Test: Prior to plant startup, inspect equipment for alignment, quiet operation, connection, and performance tests. Correct external signal interfaces, volume repeatability, and drawn velocity. The Functional Test Report shall be submitted to the Consultant for approval and sign-off by the Region.

### Commissioning activities shall be performed in accordance with Section 01810 – Equipment Testing and Facility Commissioning.

## Manufacturer’s Services

### Manufacturer’s Representative: The Contractor shall ensure that the manufacturer’s representative will attend the Site or classroom designated by the Region for the types of automatic composite samplers as indicated below, for the minimum number of Person-days listed below, travel time excluded:

#### Samplers: Primary Influent Automatic Sampler, Biological Reactor Influent (BRI) Automatic Sampler, UV Effluent (UVE) Automatic Samplers:

##### 0.5 Person-day for installation assistance and inspection.

##### 0.5 Person-day for functional and performance testing, and completion of the Manufacturer’s Certificate of Proper Installation.

##### 0.5 Person-day for pre-startup classroom or site training.

##### 0.5 Person-day for facility startup.

##### 0.5 Person-day for post startup training of Region’s personnel.

#### Samplers: Membrane Permeate Automatic Sampler:

##### 0.5 Person-day for installation assistance and inspection.

##### 0.5 Person-day for functional and performance testing, and completion of the Manufacturer’s Certificate of Proper Installation.

##### 0.5 Person-day for pre-startup classroom or site training.

##### 0.5 Person-day for facility startup.

##### 0.5 Person-day for post startup training of Region’s personnel.

#### Samplers: Dewatering Centrate (DC) Automatic Sampler, Thickened WAS (TWAS) Automatic Sampler:

##### 0.5 Person-day for installation assistance and inspection.

##### 0.5 Person-day for functional and performance testing, and completion of the Manufacturer’s Certificate of Proper Installation.

##### 0.5 Person-day for pre-startup classroom or site training.

##### 0.5 Person-day for facility startup.

##### 0.5 Person-day for post startup training of Region’s personnel.

### Training shall not commence until an accepted detailed lesson plan for each training activity has been reviewed and approved by the Region or Consultant.

### See Section 01820 – Demonstration and Training.

### See Section 11010 – Equipment General Requirements.

### See Section 01640 - Manufacturers’ Services and Section 01810 - Equipment Testing and Facility Commissioning.

**END OF SECTION**