# GENERAL

## Related Sections

### Section 01300 – Submittals

### Section 01310 – Construction Schedules

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

### Section 01430 – Operation and Maintenance Data

### Section 01810 – Equipment Testing and Facility Commissioning

### Section 01820A – Summary of Training Requirements

### Section 01820B – Training Schedule

### Section 01820C – OJT (On the Job Training Form)

### Section 01820D – Training Evaluation Form

## Definitions:

### Demonstration:

Demonstration is defined as a skilled performance of a task or technique showing precisely how it should and could be properly done on the job. Demonstration results in observational learning that allows for skill acquisition which includes “hands-on” task performance and repetition to confirm skills have been acquired.

### Trainee:

### A Trainee is defined as Region personnel selected for operating and maintaining the facility including, but not limited to, managerial and supervisory staff, operators, maintenance staff, technical specialists, capital delivery staff and other Region employees as required.

### Training Coordinator:

#### A Training Coordinator is a Region employee responsible for internal management of training administration. The position is cited on the OJT Form.

### Training:

Training is planned and o[rganized](http://www.businessdictionary.com/definition/organized.html) [activity](http://www.businessdictionary.com/definition/activity.html) aimed at imparting [information](http://www.businessdictionary.com/definition/information.html) and/or [instructions](http://www.businessdictionary.com/definition/instructions.html) to [improve](http://www.businessdictionary.com/definition/improve.html) the [recipient's](http://www.businessdictionary.com/definition/recipient.html) [performance](http://www.businessdictionary.com/definition/performance.html) or to help him or her attain a [required](http://www.businessdictionary.com/definition/required.html) level of [knowledge](http://www.businessdictionary.com/definition/knowledge.html) or [skill](http://www.businessdictionary.com/definition/skill.html). Training is a process of bringing an individual to an agreed standard of proficiency by practice and instruction and fulfilling the established learning objectives. Training allows performance to be improved by helping learners to master a new or established technology. The technology may be a piece of equipment, a complex system of devices, or a procedure for a defined operational or maintenance process.

### Category 1: Training - Detailed Training on Overall Complex System Operation

#### Category 1 training is defined as comprehensive instruction on the entire facility and overall system operation based on Consultant-developed Lesson Plans. Category 1 training is provided by the Consultant but shall be supported by the Contractor to provide essential information in order to fulfill requirements stated in the Lesson Plans.

### Category 2: Training - Detailed System and Equipment Training

#### Category 2 training is defined as training on sub-systems and equipment based on Contractor-developed and approved Lesson Plans that clearly addresses how a sub-system works, operational parameters, performance indicators, SCADA I/O and any other areas that are described and fully aligned with the Process Narratives and Process Control Narratives.

### Category 3: Equipment Demonstration

#### Category 3 training is defined as hands-on demonstration of equipment including instruments, devices etc., to trainees that encompasses theory of operation, control parameters (if any), reagents (if any), manuals, technical information, drawings, job plans, safety requirements, maintenance requirements, maintenance activities and spare parts requirements.

### Category 4: No Training Required

Category 4 training is defined as equipment, sub-systems, and/or systems that are exempt from training and demonstration. Equipment, sub-systems, and/or systems may fall into this category where operations and/or maintenance staff already possess considerable knowledge or experience with the equipment, sub-system or system.

### On-the-Job Training (OJT) Form

This is a Region-based form that allows training duration to be credited toward licensed water operator annual training requirements as accepted by OWWCO/MOECC. Sections A, B, and D of the form are to be completed by the training provider. Completed forms are to be submitted to the Consultant for all OJT cited sessions (Section 01820A – Summary of Training Requirements) within two (2) Working Days after the training.

### Lesson Plan:

A Lesson Plan is the instructor’s road map of what trainees need to learn and how it will be effectively delivered during the allocated time. A Lesson Plan requires identification of the learning objectives for the topic being covered. Lesson Plans detail the learning activities and developed strategies to obtain feedback on student learning. Lesson Plans address and integrate these four key components:

#### Objectives for trainee learning;

#### List of Personal Protective Equipment (PPE) required by trainees prior to training sessions;

#### Teaching/learning activities;

#### Method of confirming trainee understanding of the course materials (by survey, test etc.).

## General

### Contractor is responsible for coordination of the Work related to training and demonstration activities in collaboration with the Consultant.

### Contractor shall bear all costs associated with demonstration and training except where otherwise noted in this specification.

### The Region operates water and wastewater systems on a continuous 7/24 basis, and as such, considers training and demonstration to all shift operations and maintenance staff a key responsibility of the Contractor in arranging the delivery of quality training as defined by this section.

### A portion of the training sessions will be conducted during non-business hours in order to provide coverage to shift operations staff.

### Demonstration and training may be classroom based, on-site based (facility) or off-site based as appropriate. Training activity locations shall be summarized in Section 01820A – Summary of Training Requirements and Section 01820B – Training Schedule.

### The Contractor shall provide knowledgeable, authorized representatives to demonstrate and/or train on equipment and systems. All representatives must be suitably qualified and experienced in the respective types and models of equipment or systems being used as well as the intent of this specification. Contractor and Manufacturer's Representatives who provide training shall be familiar with the specific facility operations and maintenance requirements as well as with the specified equipment.

### Training is to be of sufficient detail, duration, and quality to provide trainees with the knowledge and skills to meet the following objectives:

#### Safe, reliable, cost effective, energy efficient operation of the facility, meeting regulatory requirements at all times, including under emergency modes of operation and under all design conditions (full range of device/system functional design as defined in the Contract Documents);

#### Proper preventative maintenance, diagnosis, trouble-shooting and maintenance of the facility;

#### Understanding of spare parts requirements, use of specialized equipment, tools and consumables replenishment including calibrations, calibration checks and adjustments;

#### Understanding of health and safety procedures, hazards associated with operation/maintenance of the equipment/systems in accordance with OHSA.

### The Region will not accept equipment or systems for operation by Region personnel unless all scheduled trainees have been trained.

### Contractor is not responsible for Region staff missing scheduled training sessions.

### The Region reserves the right to deduct the cost of any cancellations or repeat sessions necessary as a result of any actions or omissions of the Contractor or substandard quality of training and demonstration from any monies due to the Contractor under this Contract.

### The Region reserves the right to digitally record any or all training provided by the Contractor and any Subcontractors for exclusive use by the Region for any Category 1, 2 or 3 training sessions and will inform the Contractor prior to delivery which sessions will be recorded.

### Where appropriate, all demonstration and training shall be delivered on equipment and instruments that are capable of operating as intended. Any exceptions to such must be approved by the Region.

### Lesson Plans deemed unacceptable shall be returned to the Contractor for correction and resubmission. No delays to the training schedule are permitted due to rejected Lesson Plans.

### In the event Contractor provided training is repeated and remains unsatisfactory (as deemed by the Region), such training will be provided by a third party selected by the Region at the expense of the Contractor.

## Training Requirements

### Training activities are categorized based on existing knowledge and complexity of equipment systems and sub-systems. The Contractor shall refer to Section 01820A – Summary of Training Requirements which specifies details of the required training and delivery to defined trainees that is part of the Contract Documents.

## Training Schedule

### The Contractor shall submit a detailed schedule of training and demonstration activities by updating Section 01820A – Summary of Training Requirements addressing all cited training in Section 01820A – Summary of Training Requirements to the Consultant for approval.

### Section 01820B – Training Schedule allows all parties to view all established training dates for the duration of the project and allows the Region to ensure trainees are available for the defined dates in the schedule.

### The Contractor shall provide sufficient time in the overall construction schedule to complete all required training (Category 2 and 3) and demonstration activities prior to commissioning.

### The Region shall provide a list of trainees which are required to receive training and instruction including dates and times of shift worker availabilities. Contractor shall incorporate this information into Section 01820B – Training Schedule on an ongoing basis.

### Where the same personnel are used for testing and commissioning and for demonstration and training, ensure that the testing and commissioning Work is completed to the satisfaction of the Region before the demonstration and training commences for Region staff not involved in testing and commissioning, and that sufficient time is set aside to complete the demonstration and training.

### All factory training programs, if required, shall be completed prior to the start of testing and commissioning and shall use equipment similar to that being supplied.

### Contractor to provide all defined training on sub-systems to trainees following Functional Testing and prior to the start of overall Facility commissioning activities on related equipment and/or systems.

### All training shall be completed prior to commissioning activities as defined by Section 01810 – Equipment Testing and Facility Commissioning.

### Demonstration and training delivery shall be within a reasonable time frame following completion of Functional Testing (refer to Section 01810 – Equipment Testing and Facility Commissioning). Contractor submission of Section 01820B – Training Schedule must align with the providing training following Functional Testing and be approved by the Consultant. Any undue delay between Functional Testing completion and training will not be accepted.

### The Contractor shall coordinate the attendance of the demonstration and training specialists and/or instructors with the Consultant and Region to ensure availability of the trainees.

### The Contractor shall update and schedule the Work to be provided in accordance with Section 01310 – Construction Schedules. The Contractor shall also ensure that all Pre-purchased Equipment Vendors, suppliers and Subcontractors provide required information to Section 01820B – Training Schedule as applicable.

### The Contractor shall provide the Consultant with a Section 01820B – Training Schedule, draft course outlines, Lesson Plans (Category 2 training) and Agendas (Category 3 training) for review and acceptance at least forty (40) Working Days prior to the first training session. Schedule training only after approval by Consultant.

### All classroom training programs, if required, shall be completed prior to the start of any testing and commissioning.

## Measurement and Payment

### All costs associated with the work of this Section shall be included in the price for Item No. A1.16 in the Bid Form.

# TRAINING

## The Contractor shall submit a detailed summary of training and demonstration activities by updating Schedule 01820B – Training Schedule and addressing all cited training in Section 01820A – Summary of Training Requirements to the Consultant for approval based on the following categories:

### Category 1: Detailed Training on Overall Complex System Operation

#### The anticipated Category 1 sessions are listed in in Section 01820A – Summary of Training Requirements .

#### Category 1 training is expected to be classroom training due to its wide ranging learning objectives, and is to be provided by the Consultant. The location of the training will depend on the session topic, the trainees’ availability and accommodation of 24/7 continuous service water and wastewater operations.

#### The Contractor shall provide supporting documentation (where applicable) to the Consultant (as requested) 40 Working Days prior to scheduled training delivery.

#### The Contractor shall also furnish certified, trained, articulate personnel familiar with the Lesson Plan to co-ordinate and expedite required training development and/or delivery by the Consultant.

#### Contractor shall ensure equipment and systems are in an operational state to the satisfaction of the Consultant prior to Category 1 training by the Consultant.

### Category 2: Detailed System and Equipment Training

#### The anticipated Category 2 sessions are listed in Section 01820A – Summary of Training Requirements .

#### Contractor shall provide Lesson Plans to Consultant for approval 40 Working Days prior to scheduled delivery. The anticipated number of required sessions is shown in Section 01820A – Summary of Training Requirements for each training session.

#### Training sessions for Category 2 shall include a training evaluation form (Section 01820D – Training Evaluation Form) to be filled out by each trainee. Training evaluation forms shall be provided to the Consultant immediately upon completion of the individual session. Training shall be considered adequate if the instruction fulfilled all aspects of the Lesson Plan and the training evaluation forms indicate satisfactory training delivery. Training sessions not in accordance with the Lesson Plan shall be repeated at the Contractor’s expense.

#### Contractor shall ensure equipment and systems are in an operational state to the satisfaction of the Region prior to Category 2 training by the Contractor.

#### Contractor shall provide certified, trained, articulate representatives to coordinate and deliver Category 2 training. Training shall align with operations and maintenance manual as specified in Section 01430 – Operation and Maintenance Data.

#### Contractor shall provide properly completed Section 01820C – OJT (On the Job Training Form) where indicated on Section 01820A – Summary of Training Requirements to the Consultant within two (2) Working Days after the training.

### Category 3: Equipment Demonstration

#### The anticipated Category 3 sessions are listed in Section 01820A – Summary of Training Requirements.

#### All systems and equipment need to be demonstrated. Greater time needs to be allocated for complicated systems and equipment. General examples of systems and equipment to be demonstrated to Region staff:

##### Heating Systems

##### Ventilation Systems

##### Cooling Systems

##### Control Systems

##### Pumping Systems

##### Plumbing Systems

##### Electrical Systems

##### Control Systems

##### Overhead Doors, High Security Keying Systems

##### Filtering Equipment

##### Security Systems

##### Lighting Systems

##### Heat Tracing System

##### Hydrodynamic Mixing System

##### Environmental Chambers

##### Safety Related Systems

##### Fire Protection Related Systems

##### Specialized systems (such as chemical air scrubbing systems, etc.)

##### Building Automation Systems (BAS)

#### The Contractor shall provide a detailed agenda of the demonstration topics to the Consultant for approval 40 Working Days prior to the first demonstration session.

#### Contractor to provide Category 3 level training of sufficient quality as to allow trainees to properly inspect, clean, adjust and maintain equipment in accordance with manufacturer’s recommendations and provide information defined in Section 01425 -Computerized Maintenance Management System Data Requirements to the Consultant. The Contractor shall ensure training content (as summarized in the agenda) for Category 3 sessions include a detailed review of the items described below.

##### General Maintenance Related:

###### Non-routine maintenance and repair of equipment and systems. Training content to include control sequences, identification systems materials, special tools, fuels and lubricants.

###### Troubleshooting of equipment and systems.

###### Adjustments to equipment and systems.

###### Spare parts listing and description and recommended spare part inventory.

###### Use of special tools associated with equipment.

###### Takedown procedures (disassembly/assembly).

###### Lubrication, inspection and cleaning.

###### Health and safety procedures

##### Operations Related:

###### Operation of equipment and systems (start-up, shut-down, control, lockout, adjustments, power failure recovery).

###### Lubrication of equipment, types of lubricants.

###### Preventive maintenance procedures.

###### Optimizing equipment and system performance.

###### Capabilities of equipment and systems.

###### Operational safety of equipment and systems.

###### Emergency situation response of equipment and systems.

###### Noise, vibration and effective energy utilization adjustments.

###### O&M manuals, drawings and other related documents review.

##### Electrical and Instrumentation Related:

###### Operation of equipment and systems (start-up, shut-down, control, lockout, adjustments, power failure recovery).

###### Preventive maintenance procedures.

###### Optimizing equipment and system performance.

###### Capabilities of equipment and systems.

###### Operational safety of equipment and systems.

###### Emergency situation response of equipment and systems.

###### Noise, vibration and effective energy utilization adjustments.

##### Contractor shall provide properly completed Section 01820C – OJT (On the Job Training Form) where indicated on Section 01820A – Summary of Training Requirements to the Consultant within two (2) Working Days after the training.

### Category 4: No Training Required

#### The equipment and systems that fall under Category 4 are listed Section 01820A – Summary of Training Requirements.

#### The Contractor shall confirm all Category 4 items with the Region and obtain approval to exempt such equipment or systems from training delivery.

#### For reference purposes, the Contractor shall provide training documentation, materials, presentations or other types of educational media provided by the equipment/system manufacturer as may be available. Such information shall be provided to the Consultant.

## Training Materials

### Course Materials for Category 1, 2, and 3 training sessions:

#### Provide sufficient written materials to support all demonstration and training sessions while addressing each approved Lesson Plan for Category 1 (delivered by Consultant, supported by Contractor), Category 2 training (delivered by Contractor) and Category 3 (agenda provided by Contractor).

### All materials provided for training shall conform to the following:

#### Size: 8.5 x 11 inches.

#### Paper: 20-lb minimum, white, for typed pages.

#### Text: Manufacturer’s printed data, or neatly word processed, and designed specifically for learning. Ample space for note-taking shall be provided.

#### Double-sided.

#### Drawings and Sketches:

##### Provide a reinforced punched binder tab, bind in with text.

##### Reduce larger drawings to not larger than 11 x 17 inches and fold to the size of the text pages.

##### Use colour prints to highlight key elements.

#### Cover to include:

##### Contract number

##### Title of project

##### Identity of the separate equipment or system as applicable.

##### Identity of the general subject matter covered in the manual.

##### Locations or facility names.

##### Publication date.

##### Revision number.

### Binders shall be:

#### Commercial quality D-ring binders with durable and cleanable plastic covers.

#### Maximum post width: 2 inches.

#### When multiple binders are used, the Contractor shall correlate the information into related consistent groupings and clearly number all volumes.

### Digitally Recorded Training Modules:

#### The use of digitally recorded materials for an entire training module or part of a training module provided by the Contractor will be considered as long as it is professionally produced, reviewed and approved by the Consultant and Region prior to its use. Digitally recorded training materials shall be in DVD or other digital format approved by the Region and shall become the property of the Region for its exclusive use.

#### The use of this material shall be viewed as an enhancement to the required face-to-face training and not as a substitute.

#### The Region reserves the right to record and re-broadcast all training and/or demonstration sessions.

## Submittals

#### The Contractor shall develop, maintain and provide properly completed Section 01820A – Summary of Training Requirements to the Consultant for approval on an ongoing basis that summarizes all training modules delivery details (date, time, location, Category, title, number of participants, etc.) over the life of the Project.

#### All training sessions shall be documented with respect to course title, date/time, instructor’s name, duration, attendees (including signed attendance records), location and any other relevant information required by the Region.

#### A digital storage device (CD, DVD, portable storage device) containing the training session Lesson Plan (Category 2) and Agenda (Category 3) including prepared instructional material.

#### Draft training related submissions (Lesson Plans, agendas, training materials etc.) shall be submitted during the shop drawing submittal stage. Final approved training modules shall be submitted forty (40) Working Days prior to the scheduled date for training.

#### The Contractor shall furnish complete training materials including operation and maintenance requirements and other data, to be retained by each trainee plus one master copy and two additional copies to be provided to the Region.

#### Training material shall be submitted in digital format as PDFs created in the latest edition of Adobe Acrobat, and include all drawings as PDFs and original AutoCAD (latest version) files.

#### The Contractor shall submit properly completed Section 01820C – OJT (On the Job Training Form)(s) for all training cited in Section 01820A – Summary of Training Requirements requiring an OJT form for Category 2 and 3 training sessions.

#### Training session evaluation forms shall be provided to each trainee and completed forms to be provided to the Consultant for Category 1 and 2 sessions. Contractor shall provide all such documentation to the Consultant within 2 Working Days of completing the individual training session for all training categories. Course evaluation forms provided for Category 2 training shall be reviewed by the Consultant and Region and if deemed inadequate shall direct the Contractor to repeat the training session(s) at no additional cost to the Region until delivery is considered satisfactory by the Consultant.

## Supplements

### The supplements listed below, following “End of Section,” are part of this Specification.

#### Section 01820A – Summary of Training Requirements

#### Section 01820B – Training Schedule

#### Section 01820C – OJT (On the Job Training Form)

#### Section 01820D – Training Evaluation Form

**END OF SECTION**