Use this section, editing to reflect specific Project, for procedures related to demonstration and training of equipment and systems, including maintenance, to Owner’s personnel if any.

# General

## SECTION INCLUDES

### Demonstration of equipment and systems to Owner’s personnel.

### Training of equipment and systems to Owner’s personnel.

## RELATED SECTIONS

### For definition of terms, see Section 01 00 00 General Requirements, 1.3 Words, Terms and Communications.

### This section describes requirements applicable to all Sections within Divisions 01 to 33.

## DESCRIPTION

Use the following article when Contractor has provided design for systems and equipment.

### [Provide overview of project including design philosophy and functionality of architectural, mechanical and electrical systems and equipment.]

Use the following article when Consultants have provided design for systems and equipment.

### [Request that Consultants provide personnel and coordinate times and dates for presentation at the demonstration and training for overview of project including design philosophy and functionality of architectural, mechanical and electrical systems and equipment.]

### Demonstrate operation and maintenance of equipment and systems including pertinent architectural systems such as building envelope to Owner's personnel.

### Owner will provide list of personnel to receive demonstrations and training and will coordinate their attendance at agreed‑upon times.

### Provide specific training for equipment and systems as required.

## RESPONSIBILITIES

Edit the following article for appropriate participants.

### The [Project Manager] [Construction Manager] [ and Commissioning Authority] will work with the Contractor to coordinate, and schedule subcontractors and vendors (mechanical, electrical, controls, architectural, fire protection, specialty, etc.), and ensure that the building overview, demonstrations and training are organized and completed effectively.

### UBC Project Manager to coordinate with the Facilities Transition Team for review of the agenda and project specific demonstrations needed.

## DEMONSTRATION OF EQUIPMENT & SYSTEMS TO OWNER’S PERSONNEL

### General:

#### Provide knowledgeable, authorized representatives to demonstrate operation of equipment and systems.

#### Provide designated Owner personnel with comprehensive orientation in the understanding of the systems and the operation and maintenance of each piece of equipment that makes up each system.

## ADMINISTRATIVE REQUIREMENTS

### Preparation of Agendas and Schedules:

#### Agendas and Schedules to include:

##### Equipment and systems to be included in presentations and outline of content for each system.

##### Name of companies and representatives presenting.

##### Time and date allocated to each system and item of equipment.

#### The actual dates for the demonstrations should be set well in advance on the overall project schedule. The meeting notices for the demonstrations need to be issued a minimum of two (2) weeks prior to allow for scheduling of personnel.

#### Refer to the CPG-01-Project Handover Demonstrations guide located [here](https://technicalguidelines.ubc.ca/files/CPG-01-Project_Handover_Demonstrations.pdf) for additional guidance on setting up demonstrations for Building Operations personnel.

### Organization

#### Arrange for presentation leaders familiar with the design, operation, maintenance and troubleshooting of the equipment and systems. Where a single person is not familiar with all aspects of the equipment or system, arrange for specialists familiar with each aspect.

## SUBMITTALS

### Provide a building overview and demonstration plan two months in advance, covering the following elements:

#### Equipment and systems

#### Intended audience

#### Schedule including agenda and duration

### Submit meeting notices for demonstration of each system three weeks prior to designated dates.

### UBC Project Managers in collaboration with the Facilities Transition Team to make list of deficiencies [to submit to the Construction Manager] [Contractor] and indicate if further demonstrations and/or training are required.

## CONDITIONS FOR DEMONSTRATIONS

### Demonstrations are to be conducted after commissioning, testing, adjusting and balancing are complete and equipment and systems are fully operational. Demonstrations may occur prior to the above if required by the project schedule and to be confirmed with the Facilities Transition Team.

### Commissioning Authority to confirm status of commissioning, performance testing and readiness for handover prior to the demonstrations taking place.

### Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

## SYSTEMS AND EQUIPMENT TO BE DEMONSTRATED

### 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:

Edit the following subparagraphs for appropriate systems and equipment to be demonstrated.

#### [Heating System]

#### [Ventilation System]

#### [Cooling System]

#### [Control System]

#### [Plumbing System]

#### [Electrical System]

#### [Control Systems]

#### [Overhead Doors]

#### [Loading Dock Equipment]

#### [Filtering Equipment]

#### [Security Systems]

#### [Lighting Systems]

#### [Environmental Chambers]

#### [Fire Protection Related Systems]

#### [Elevator Systems]

#### [Unique systems such as Variable Refrigerant Flow systems, Thermenex heating and cooling system etc.]

#### Automated Operable Windows

#### Refer to CPG-01-Project Handover Demonstrations Guide for discipline-specific demonstrations that may be needed.

## PRESENTATION OF DEMONSTRATIONS

### Building and Project Overview:

#### Provide overall review of design philosophy and objectives.

#### Depending on the size and complexity of the project, a separate session may be required for the project overview.

### Verify that suitable conditions for demonstrations are available.

### Verify that designated personnel are present.

### Provide digital copies of applicable architectural, mechanical, electrical and other drawings, manuals, and vendor equipment information. Digital drawings, manuals and vendor information to be displayed using projector, or large screen monitor as appropriate to size of group. As reasonably feasible, provide one hard copy of pertinent full size drawings, manuals and vendor equipment for review.

### Conduct classroom overview of equipment and systems using digital and hard copies of drawings, manuals and videos.

### Explanation of Design Strategy

#### Explain design philosophy of each system, including the following information:

#### An overview of how system is intended to operate.

#### Description of design parameters, constraints and operational requirements.

#### Description of system operational strategies.

#### Information to help in identifying and troubleshooting system problems.

### Following the classroom session, the demonstration to continue in the field.

### Demonstrate start‑up, operation, control, adjustment, trouble‑shooting, servicing, and maintenance of each item of equipment at scheduled times, at the equipment location.

### Instruct personnel in all phases of operation and maintenance using operation and maintenance manuals as the basis of instruction. Follow the outline in the table of contents of the operation and maintenance manual and illustrate whenever possible the use of the O&M manuals for reference.

#### Review contents of manual in detail to explain all aspects of operation and maintenance.

#### Prepare and insert additional data in operations and maintenance manuals when the need for additional data becomes apparent during instructions.

### During any demonstrations, should the system fail to perform in accordance with the requirements of the O&M manual or sequence of operations, the system shall be repaired or adjusted as necessary and the demonstration repeated at another scheduled time.

### The appropriate trade or manufacturer's representative shall provide the instructions on each major piece of equipment. Practical building operating expertise as well as in-depth knowledge of all modes of operation of the specific piece of equipment are required. More than one party may be required to execute the demonstration.

### The controls contractor shall attend sessions other than the controls training, as required, to discuss the interaction of the controls system as it relates to the equipment being discussed.

### The contractor shall fully explain and demonstrate the operation, function and overrides of any local packaged controls not controlled by the central control system.

### For complicated equipment and systems and/or where the site is too noisy to properly answer questions, return to classroom to answer additional questions.

## TRAINING

### Training is required for new, specialized or unique equipment and systems where demonstrations are not sufficient to enable the Owner to properly operate and maintain the equipment and system.

### Costs for bringing the appropriate expert training personnel to UBC to conduct classroom and field training is to be covered by the Contractor and/or project.

### Details for training including content and schedule are to be arranged with the Facilities Transition Team.

### Training details shall include:

#### Use of the installation, operation and maintenance instruction material included in the O&M manuals.

#### A review of the O&M instructions emphasizing safe and proper operating requirements, preventative maintenance, special tools needed and spare parts inventory suggestions. The training shall include start-up, operation in all modes possible, shutdown, seasonal changeover and any emergency procedures.

#### Discussion of relevant health and safety issues and concerns.

#### Discussion of warranties and guarantees.

#### Common troubleshooting problems and solutions.

#### Discussion of any peculiarities of equipment installation or operation.

#### Hands-on training shall include start-up, operation in all modes possible, including manual, shut-down, alarms, power failure and any emergency procedures, and preventative maintenance for all pieces of equipment.

#### Classroom sessions shall include the use of large screen monitors, overhead projections, slides, video/audio-taped material.

#### Training may occur before performance testing is complete if required by the project schedule.

#### UBC Building Operations may choose to videotape specific training sessions.

# Products

## NOT USED

### Not Used.

# Execution

## NOT USED

### Not Used.

\*\*\*END OF SECTION\*\*\*