SEMEMI254

# Assisting in the installation of environmental pollution control equipment

## Overview

This standard identifies the competences you need to assist in the installation of environmental pollution control equipment, in accordance with approved procedures. You will be required to assist in the installation of equipment for an environmental pollution control system, which could be air pollution control equipment (such as decarbonisation (CO2 reduction), denitrification, deodorising, desulphurisation, dust collectors, smoke filters, scrubbers, and removal of refrigerant gases); effluent treatment equipment (such as aerobic and anaerobic biochemical treatment, filter screens and presses, liquid separators, waste oil treatment, sewage treatment, industrial waste water treatment); noise and vibration equipment (such as vibration prevention and isolation, noise attenuation and acoustic enclosures); waste and used product handling, storing and recycling equipment (such as appliance recycling, battery recycling, incinerators, ash handling, heat recovery, shredders and crushers, conveyors and sorters, compaction).

This standard does not involve maintenance/repair type activities, such as removal and replacement of existing equipment.

You will be required to use the appropriate tools and equipment throughout the installation activities, and to apply a range of installation methods and techniques to position, level and align the equipment and to make connections to the required services. The installation activities will include making checks and adjustments, in line with your permitted authority, and assisting others to ensure that the installed equipment functions to the required specification.

Your responsibilities will require you to comply with organisational policy and procedures for the installation activities undertaken, and to report any problems with the activities, tools or equipment used that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You must check all tools, equipment and materials used in the installation activities are removed from the work area on completion of the work, and that all necessary job/task documentation is completed accurately and legibly. You will be expected to work to instructions, alone or in conjunction with others, taking personal responsibility for your own actions, and for the quality and accuracy of the work that you carry out.

The installation activity may be carried out as a team effort, but you must demonstrate a significant personal contribution to the installation activities, in order to satisfy the

requirements of the standard, and you must demonstrate competence in all the areas required by the standard.

Your underpinning knowledge will be sufficient to provide a sound basis for your work, and will enable you to adopt an informed approach to applying mechanical installation procedures. You will have an understanding of the equipment being installed, and its installation requirements, in adequate depth to provide a sound basis for carrying out the installation process safely and effectively.

You will understand the safety precautions required when carrying out the installation activities, especially those for ensuring the safe isolation of services. You will be required to demonstrate safe working practices throughout, and will understand your responsibility for taking the necessary safeguards to protect yourself and others in the workplace.

## Performance criteria

*You must be able to:*

P1 work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines

P2 follow all relevant instructions/documentation for the installation being carried out

P3 use the correct tools and equipment for the installation operations, and check that they are in a safe and usable condition

P4 assist in the installation, positioning and securing of the equipment, using appropriate methods and techniques

P5 carry out and/or assist in checking the installation, and make any adjustments in accordance with the specification

P6 assist in using fault location methods and techniques on the installed equipment

P7 deal with problems within your control and report those that cannot be solved

P8 dispose of waste materials in line with organisational and environmentally safe procedures

P9 complete and store all relevant documentation in accordance with organisational requirements

## Knowledge and understanding

*You need to know and understand:*

K1 how to work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
K2 the importance of wearing the appropriate personal protective equipment (PPE), and of keeping the work area clean and tidy
K3 how to obtain and interpret information from job instructions and other documents needed in the installation process
K4 the basic principles of how the equipment functions, and its operating sequence
K5 methods and techniques used to position, assemble, align and secure the plant and equipment
K6 methods of making holes for floor fixing bolts
K7 the various mechanical fasteners that will be used, and their method of installation
K8 procedures for ensuring that you have the correct tools, equipment, and fasteners for the installation activities
K9 methods of lifting, handling and supporting the equipment
K10 checks, tests, corrections and adjustments to ensure proper equipment safety, integrity, operation and accuracy
K11 connecting equipment to external supplies
K12 why electrical bonding is critical, and why it must be both mechanically and electrically secure
K13 the procedure for the safe disposal of waste materials
K14 recognising defects
K15 the importance of ensuring that the completed installation is left in a safe, clean and damage-free state
K16 the dangers of leaving any exposed potential energy sources
K17 typical issues that can occur during the installation, and how these can be overcome
K18 the fault finding techniques to be used if the equipment fails to operate correctly
K19 the recording documentation to be completed for the activities undertaken
K20 the extent of your own responsibility and to whom you should report if you have problems that you cannot resolve

## Scope/range related to performance criteria

1 Carry out all of the following during the installation of the environmental pollution control equipment:

1.1 adhere to procedures or systems in place for risk assessment, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work

1.2 confirm that authorisation to carry out the installation activities has been given

1.3 check that safe access and working arrangements for the installation area have been provided

1.4 confirm that services have been safely isolated, ready for the installation (such as mechanical, electricity, gas, air or fluids)

1.5 check that all required installation consumables are available

1.6 leave the work area in a safe condition and free from foreign object debris

2 Assist in the installation of one of the following types of environmental pollution control equipment:

2.1 air pollution control equipment (such as decarbonisation (CO2 reduction), denitrification, deodorising desulphurisation, dust collectors, smoke filters, scrubbers, and removal of refrigerant gases)

2.2 effluent treatment equipment (such as aerobic and anaerobic biochemical treatment, filter screens and presses, liquid separators, waste oil treatment, sewage treatment, industrial waste water treatment)

2.3 noise and vibration equipment (such as vibration prevention and isolation, noise attenuation and acoustic enclosures)

2.4 waste and used product handling, storing and recycling equipment (such as appliance recycling, battery recycling, incinerators, ash handling, heat recovery, shredders and crushers, conveyors and sorters, compaction)

3 Assist in the installation of eight of the following components:

3.1 annunciator

3.2 actuators

3.3 wiring enclosures

3.4 distribution board

3.5 mechanical drives

3.6 switches

3.7 switch gear

3.8 burners
3.9 ducting
3.10 instrumentation
3.11 containment booms
3.12 pumps
3.13 pipework and hoses
3.14 floor baseplates
3.15 safety devices
3.16 safety device
3.17 gear boxes
3.18 motor and starter
3.19 monitoring device
3.20 motors
3.21 control panel
3.22 couplings or linkages
3.23 sensors
3.24 building management device
3.25 relays or solenoids
3.26 cables and wires

4 Apply installation methods and techniques to include five of the following:
4.1 marking out of locating and securing positions
4.2 aligning equipment
4.3 drilling and hole preparation
4.4 levelling equipment
4.5 fitting inserts (such as rag or expanding bolts)
4.6 shimming and packing
4.7 positioning the equipment
4.8 fitting anti-vibration mountings
4.9 making installation connections (such as mechanical, electrical, fluid power, utilities)
4.10 securing by using mechanical fixings
4.11 applying screw fastener locking devices

5 Use three of the following instruments during the installation activities:
5.1 straight edges and feeler gauges

5.2 plumb lines/taut wires
5.3 engineers' levels
5.4 alignment telescopes
5.5 dial test indicators
5.6 laser equipment
5.7 mechanical measuring instruments (such as rule, tape)
5.8 self-diagnostic equipment
5.9 electrical measuring instruments (such as multimeter)
5.10 theodolite
5.11 fluid power measuring equipment (such as pressure, flow)
5.12 vibration transducer

6 Assist in the movement and positioning equipment using two of the following
6.1 slings
6.2 portable lifting devices
6.3 rollers/skates
6.4 jacks
6.5 cranes
6.6 block and tackle
6.7 hoists
6.8 manual handling
6.9 fork lift

7 Carry out all of the following checks, and make corrections/adjustments as appropriate:
7.1 making `on-load' checks
7.2 making sensory checks (sight, sound, smell, touch)
7.3 checking level and alignment
7.4 ensuring that dangerous areas are properly guarded
7.5 lubrication effects
7.6 checking torque settings of fasteners
7.7 checking for leaks
plus: assist in carrying out two of the following checks:
7.8 assembly fits
7.9 system pressures and flows
7.10 mechanical integrity

7.11 speeds and feeds
7.12 electrical integrity
7.13 vibration levels
7.14 temperature levels
7.15 testing to ensure that the equipment meets the requirements of the installation

8 Assist in dealing with two of the following conditions during the installation process:
8.1 installations with no faults
8.2 partial equipment malfunction
8.3 complete malfunction of equipment

9 Assist in using fault location methods and techniques on the installed equipment, to include one of the following:
9.1 diagnostic aids (such as company records/history, manufacturers' manuals, fault analysis charts, troubleshooting guides)
9.2 fault finding technique (such as six point, half-split, unit substitution)
9.3 function testing the installation/running equipment self-diagnostics

10 Produce installations which comply with one of the following:
10.1 equipment manufacturer's operation range
10.2 BS, ISO and/or BSEN standards
10.3 customer standards and requirements
10.4 organisational standards and procedures

11 Assist in the completion of the relevant paperwork, to include one from one of the following:
11.1 installation records
11.2 organisational specific documentation
11.3 job card
11.4 electronic reports

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| **Developed by** | Enginuity |
| **Version Number** | 3 |
| **Date Approved** | 31 Mar 2026 |
| **Indicative Review Date** | 01 Apr 2029 |
| **Validity** | Current |
| **Status** | Original |
| **Originating Organisation** | Enginuity |
| **Original URN** | SEMEMI2-54 |
| **Relevant Occupations** | Maintenance Fitter |
| **Suite** | Engineering Maintenance and Installation Suite 2 |
| **Keywords** | Engineering; manufacturing; installation; environmental pollution; control equipment; air pollution; effluent treatment; waste |