Plumbers, Gasfitters and Drainlayers Board

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Competencies required for registration examinations

This document provides a detailed overview of the competencies and knowledge areas that are assessed when sitting the plumbing, gasfitting and drainlaying registration examinations.

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9192 Plumber examination

The applicant must demonstrate knowledge and have the experience and practical ability to install, test, commission, fault find and maintain sanitary plumbing systems by means of the following competences:

Trade calculations and trade sciences

Descriptors may include, but are not limited to the following:

- Estimation, measurement and calculation using measurement systems
- Application of formulae
- Physics laws as they relate to sanitary plumbing
- Hydraulic principles
- Expansion and contraction
- Corrosion protection
- Water quality
- Density
- Energy transfer

Limitations and applications of materials used in sanitary plumbing, including material protection and jointing methods

Descriptors may include, but are not limited to, the following:

- Copper
- PVC
- Polybutylene (PB)
- Polyethylene (PE)
- Acrylonitrile Butadiene Styrene (ABS)
- Polypropylene
- Cross linked polyethylene
- Brass/bronze
- Cast iron
- Sheet metal
- Lead

Drawings and specifications for sanitary plumbing

Descriptors may include, but are not limited to the following:

- Interpreting plans and specifications
- Drawing as- built
- Development of patterns

Installation, testing, commissioning, fault-finding and maintenance of water services for sanitary plumbing

Descriptors may include, but are not limited to the following:

- Pipe sizing principles
- Hot and cold-water reticulation systems
- Water storage systems
- Domestic fire sprinkler systems
- Rainwater harvesting
- Pumps
- Sanitary appliances and fixtures
- Backflow prevention
- Heating systems that relate to sanitary plumbing
    i. Hot water systems
    ii. Solar water heating
- Alternative water supplies

Installation, testing, commissioning, fault-finding and maintenance of foul water systems

Descriptors may include, but are not limited to, the following:

- Principles of sizing and venting for foul water plumbing systems
- Pumps
- Sanitary appliances and fixtures
- Backflow prevention
- Irrigation systems

Access to, and application of, relevant documentation relating to sanitary plumbing to meet compliance requirements, and an understanding of the regulatory environment

Descriptors may include, but are not limited to, the following:

- Acts and regulations
- Standards

- Codes
- Manufacturers’ instructions

The effect of the installation of sanitary plumbing systems, or its components, on the integrity of structures; including weather tightness considerations as they relate to penetrations to building envelope

Descriptors may include, but are not limited to, the following:

- Preservation of structural integrity
- Prevention of damage to property including weather tightness

Responsibilities relating to health and safety

Descriptors may include, but are not limited to, the following:

- Personal and public safety
- Site safety
- Electrical safety
- Environmental considerations

Limitations on persons who do, or assist in doing, sanitary plumbing work

9195 Certifying plumber examination

The applicant must demonstrate the ability to design, manage the installation of and verify sanitary plumbing systems by means of the following competencies.

Trade calculations and trade science used in the design and installation of sanitary plumbing systems

Descriptors may include, but are not limited to, the following:

- Estimation, measurement and calculation using measurement systems
- Application of formulae including transposing
- Physics laws and their application as they relate to sanitary plumbing
- Hydraulic principles
- Expansion and contraction
- Corrosion protection
- Water quality
- Density
- Energy transfer

Selection of materials; their properties, applications and how they are used in the design and specification of sanitary plumbing systems

Descriptors may include, but are not limited to, the following:

- Compatibility, testing and commissioning procedures
- Alternative materials, approval regimes, protection of material

Drawings and specifications for sanitary plumbing

Descriptors may include, but are not limited to, the following:

- Preparing plans and specifications

Design, specification and verification of water services for sanitary plumbing systems

Descriptors may include, but are not limited to, the following:

- Pipe sizing principles
- Hot and cold-water reticulation systems
- Water storage systems
- Domestic fire sprinkler systems

- Rainwater harvesting
- Pumps
- Sanitary appliances and fixtures
- Backflow prevention
- Heating systems that relate to sanitary plumbing
    i. Hot water systems
    ii. Solar water heating
- Alternative water supplies

Design and specification of foul water systems for sanitary plumbing

Descriptors may include, but are not limited to, the following:

- Principles of sizing and venting for foul water plumbing systems
- Pumps
- Sanitary appliances and fixtures
- Backflow prevention
- Irrigation systems

Access to, and application of, relevant documentation relating to sanitary plumbing to meet compliance requirements, and an understanding of the regulatory environment

Descriptors may include, but are not limited to, the following:

- Acts and regulations
- Standards
- Codes
- Manufacturers' instructions

Management of the effect on the integrity of structures relating to the design and installation of sanitary plumbing systems; including weather tightness considerations as they relate to penetrations to the building envelope and the coordination with other services

Descriptors may include, but are not limited to, the following:

- Preservation of structural integrity
- Prevention of damage to property including weather tightness
- Positioning and protection of services along with the coordination with other building services.

Responsibilities relating to managing health and safety

Descriptors may include, but are not limited to, the following:

- Health and safety systems, preparation of safety plans

Responsibilities relating to the oversight and/or supervision of persons who do, or assist in doing, sanitary plumbing work

9193 Gasfitter examination

The applicant must demonstrate knowledge and have the experience and practical ability to install, test, commission, fault-find and maintain gasfitting systems by means of the following competencies.

Trade calculations and trade sciences

Descriptors may include, but are not limited to, the following:

- Estimation, measurement and calculation using measurement systems
- Application of formulae
- Gas rating
- Heat input/output calculations
- Pipesizing
- Fluing
- Corrosion
- Flame characteristics
- Flammability limits
- Physics laws as they relate to gasfitting
- Combustion and ventilation
- Expansion and contraction

Limitations and applications of materials used in gasfitting, including material protection and jointing methods

Descriptors may include, but are not limited to, the following:

- Copper
- PVC
- Polyethylene (PE)
- Mild steel
- Stainless steel
- Cross linked polyethylene
- Brass/bronze
- Cast iron
- Aluminium
- Fire-rated materials

- Use of tools and equipment

Installing, testing, commissioning, fault finding, maintaining of gas installations

Descriptors may include, but are not limited to, the following:

- Appliances
- Equipment
- Ventilation
- Pipework
- Fluing

Types, uses, characteristics, composition and safe storage and handling of fuel gases

Descriptors may include, but are not limited to, the following:

- Manufactured gas
- Natural gas
- Liquefied petroleum gas (LPG)
    i. Butane
    ii. Propane
    iii. General product

Principles of space and water heating systems

Descriptors may include, but are not limited to, the following:

- Principles and components of direct and indirect heating and ventilation
- Solar boosted systems
- Hydronic systems
- Fans
- Ducting

Drawings and specifications for gasfitting

Descriptors may include, but are not limited to, the following:

- Interpreting plans and specifications
- Drawing as-built
- Development of patterns

Electrical and electronics work as it applies to gasfitting within the limitations under the Electricity Act

Access to, and application of, relevant documentation relating to gasfitting to meet compliance requirements, and an understanding of the regulatory environment

Descriptors may include, but are not limited to, the following:

- Acts and regulations
- Standards
- Codes
- Manufacturers' instructions

The effect of the installation of gasfitting systems, or its components, on the integrity of structures; including weather tightness considerations as they relate to penetrations to the building envelope

Descriptors may include, but are not limited to, the following:

- Preservation of structural integrity
- Prevention of damage to property, including weather tightness

Responsibilities relating to health and safety

Descriptors may include, but are not limited to, the following:

- Personal and public safety
- Site safety
- Electrical safety

Limitations on persons who do, or assist in doing, gasfitting work

9196 Certifying gasfitter examination

The applicant must demonstrate the ability to design, manage the installation of and verify/ certify gasfitting systems by means of the following competencies.

Trade calculations and trade science used in the design and installation of gasfitting systems

Descriptors may include, but are not limited to, the following:

- Estimation, measurement and calculation using measurement systems
- Application of formulae
- Physics laws and their application as they relate to gasfitting
- Combustion and ventilation
- Flame characteristics
- Flammability limits
- Gas rating
- Heat input/output and efficiency calculations
- Expansion and contraction
- Corrosion
- Fluing
- Pipe sizing
- Pressure
- Volume

Drawings and specifications for gasfitting

Descriptors may include, but are not limited to, the following:

- Preparing plans and specifications

Selection of materials; their properties, applications and how they are used in the design and specification of gasfitting

Descriptors may include, but are not limited to, the following:

- Compatibility, testing and commissioning procedures
- Alternative materials, approval regimes, protection of material

Design, specification and verification/ certification of gasfitting installations and system components

Descriptors may include, but are not limited to, the following:

- Gas supply pipework, service lines, meters and regulator systems
- Sizing the appliance to meet the duty required
- Domestic gas-fired appliances and equipment installations
- Commercial gas-fired appliances and equipment installations
- Industrial gas-fired appliances and equipment installations
- Pressure and flow controls
- Safety devices

Access to, and application of, relevant documentation relating to gasfitting to meet compliance requirements, and an understanding of the regulatory environment

Descriptors may include, but are not limited to, the following:

- Acts and regulations
- Standards
- Codes
- Manufacturers' instructions

Management of the effect on the integrity of structures relating to the design and installation of gasfitting systems; including weather tightness considerations as they relate to penetrations to the building envelope and the coordination with other services

Descriptors may include, but are not limited to, the following:

- Preservation of structural integrity
- Prevention of damage to property including weather tightness
- Positioning and protection of services along with the coordination with other building services

Responsibilities relating to managing health and safety

Descriptors may include, but are not limited to, the following:

- Health and safety systems, preparation of safety plans

Responsibilities relating to the oversight and/or supervision of persons who do, or assist in doing, gasfitting work

9197 Drainlayer examination

The applicant must demonstrate knowledge and have the experience and practical ability to install, test, commission, fault-find and maintain drainage systems related to drainlaying work by means of the following competencies.

Trade calculations and trade sciences

Descriptors may include, but are not limited to, the following:

- Estimation, measurement and calculation using measurement systems
- Application of formulae
- Physics laws as they relate to drainlaying
- Hydraulic principles
- Expansion and contraction
- Corrosion protection
- Water quality (black, grey, recycled and potable)

Installation, testing, commissioning, fault finding and maintenance of foul water and stormwater systems for drainlaying

Descriptors may include, but are not limited to, the following:

- Foul water systems
- Stormwater systems
- Trade waste systems
- On-site effluent disposal systems
- On-site wastewater treatment systems

Limitations and applications of materials used in drainlaying, including material protection and jointing methods

Descriptors may include, but are not limited to, the following:

- Copper
- PVC
- Asbestos
- Polyethylene (PE)
- Stainless steel
- Acrylonitrile Butadiene Styrene (ABS)
- Polypropylene

- Brass/bronze
- Cast iron
- Steel
- Earthenware
- Concrete
- Bedding materials and backfill
- Use of tools and equipment

Drawings and specifications for drainlaying

Descriptors may include, but are not limited to, the following:

- Interpreting plans and specifications
- Drawing as-built

Access to, and application of, relevant documentation relating to drainlaying to meet compliance requirements, and an understanding of the regulatory environment

Descriptors may include, but are not limited to, the following:

- Acts and regulations
- Standards
- Codes
- Manufacturers' instructions

Responsibilities relating to health and safety

Descriptors may include, but are not limited to, the following:

- Personal and public safety
- Site safety including safety precautions for earthworks and excavations
- Electrical safety
- Environmental considerations
- Other services' location
- Working in confined spaces
- Particular hazardous work

Limitations on persons who do, or assist in doing, drainlaying work

9198 Certifying drainlayer examination

The applicant must demonstrate the ability to design, manage the installation of and verify drainage systems related to drainlaying work by means of the following competencies.

Trade calculations and trade science used in the design and installation of drainage systems

Descriptors may include, but are not limited to, the following:

- Estimation, measurement and calculation using measurement systems
- Application of formulae
- Physics laws as they relate to drainlaying
- Hydraulic principles
- Expansion and contraction
- Corrosion protection
- Water quality (black, grey, recycled)
- Density

Specification of materials; their properties, applications and how they are used in the design and specification of drainage systems

Access to, and application of, relevant documentation relating to drainlaying to meet compliance requirements, and an understanding of the regulatory environment

Descriptors may include, but are not limited to, the following:

- Acts and regulations
- Standards
- Codes
- Manufacturers' instructions

Design and verification of foul water and stormwater systems for drainlaying

Descriptors may include, but are not limited to, the following:

- Foul water systems
- Stormwater systems
- Trade waste systems
- On-site effluent disposal systems

- On-site wastewater treatment systems

Management of the effect on structures and sites relating to the design and installation of drainage systems, and the coordination with other services

Responsibilities relating to managing health and safety

Descriptors may include, but are not limited to, the following:

- Health and safety systems, preparation of safety plans
- Site safety including safety precautions for earthworks and excavations
- Environmental considerations
- Working in confined spaces
- Particular hazardous work

Responsibilities relating to the oversight and/or supervision of persons who do, or assist in doing, drainlaying work