



Plumbers,

Gasfitters and

Drainlayers Board

Examination Guide 9197

Licensed Drainlayer Registration Examination

August 2010

Introduction

This document provides examination information to those who are intending to sit the Licensed Drainlayer 9197 registration examination leading to eligibility for registration as a Licensed Drainlayer by the Plumbers, Gasfitters and Drainlayers Board ("the Board").

Examination Licensed Drainlayer Registration Examination 9197

1. Candidates are expected to answer examination questions in accordance with the Acts, Regulations and Codes in force at 1 January of the calendar year of the examination.
2. The purpose of the examination is eligibility for registration under the Plumbers, Gasfitters, and Drainlayers Act 2006 ("the Act").
3. The pass mark is 60%.
4. The examination is administered and managed by the Board or its agent(s).

Examination Information

Please refer to www.pgdb.co.nz for all examination information and forms.

Registration as a Licensed Drainlayer

For information and an application form on how to become a Licensed Drainlayer, please refer to the Board's website.

Drainlaying Registration Examination

9197 Licensed Drainlayer

Introduction

The examination scope has been specified by a Notice published in Gazette. This notice can be accessed through the Board's website www.pgdb.co.nz under the "About us" - "Publications/Reference Docs".

Written Examination

1. Calculations within trade practice.
 - Use simple mathematics.
 - Scale factors.
 - Proportions and ratios.
 - Fractions, decimals and percentages.
 - Estimate, measure and calculate using metric measurement systems.
 - Distances.
 - Angles.
 - Areas.
 - Volume.
 - Weight.
 - Pressure.
 - Velocity.
 - Perform formulae-based calculations.
 - Volumetric and lineal equations.
 - Transposition of formulae.
 - Convert metric units.
 - Interpret information from graphs and tables.
 - Numerical information is interpreted accurately from graphs and tables.
2. Materials, tools and equipment used in drainlaying.
 - Materials
 - Pipework (pipes and fittings) including but not limited to PVC, polyethylene, earthenware, concrete, asbestos/spun fibre.
 - Concrete and mortar: cement, sand, shingle (selection mixing and use). Treatment additives.
 - Bitumen.
 - Copper, galvanised steel, mild steel, stainless steel.
 - Jointing methods including but not limited to: compression, ring and sleeved, solvent jointed and fusion welded.
 - Making of rigid and flexible joints.
 - Identify and describe hand tools and checking equipment for drainlaying.
 - Axe, breaking bar, bolt cutters, boning rods, bottle, broom, bucket, chamfering tool, cold chisel, files, flare tools, floats (steel, wooden), hacksaw, handsaw, hammers (claw, dumpy), keys, mirror, pencil, pick, pinch bar, pipe wrench, plumb bob, probe, rule and tapes,

spanners (adjustable, open-ended), smart level, socket set, spade, spirit level, string line, torch, trowels, wire tiers, wheel cutter.

- Identify and describe trade equipment and power tools used for drainlaying.
 - Barrow, block and tackle, cable detector, chainsaw, chains, clearing rods, concrete cutter, concrete mixer, concrete vibrator, drain clearing machines (hydraulic, mechanical), drills, dumpy level, earth compactor, earth leakage circuit breaker, electrical leads, gas detector, grinders, lid keys, ladder, laser levelling equipment, manometer, portable generator, ratchet tie downs, safety barriers, signs, powersaw, submersible pump, surface pump, testing plugs, underground services detector, valve keys, video camera and monitor.
- Pipe relining processes.
- Environmentally considerate processes for maintaining and cleaning tools and equipment in terms of minimising damage to the site and environment.
- Dealing with surplus materials, workplace disposal and legislative requirements.

3. Safety precautions.

- Demonstrate knowledge of the properties and hazards of gas types when undertaking drainlaying work.
 - Composition, visibility, flammability, concentration, toxicity, relative density, smell, ignition temperature and burning.
- Describe the precautions and actions to be taken when working with different gas types when undertaking drainlaying work.
 - Use of protective and detection equipment (i.e. gas mask, gas detectors).
 - Precautions to be taken to prevent fire and to protect personnel.
 - Actions to eliminate sources of ignition.
 - Practical actions to be taken in the event of a gas fire.
 - Practical actions to be taken in the event of exposure to toxic gases.
- Knowledge of electricity, electrocution, and electrical hazards in drainlaying.
- Knowledge of regulations applicable to electrical installations and workplaces.
- Activities carried out to avoid harm to people and damage to property, other services, materials, tools, and equipment.
 - Dewatering systems.
- Safety precautions for earthworks and excavations.
- Demonstrate knowledge of cardiopulmonary resuscitation procedures (CPR).

4. Ability to plan, draw and interpret drawings within accepted trade practice.

- Interpret drawings and specifications for drainlaying.

- Data, scales and symbols are interpreted in terms of the equipment or materials and/or the system required for job specifications.
- Baseline and contour data points are interpreted to meet job requirements.
- Detailed dimensions, profiles, equipment lay-out, space information for running pipes, construction details and related notes are interpreted to meet job requirements.
- Draw drawings for drainlaying jobs.
 - Drawings to include all the main features of the installed system in accordance with job requirements.
 - The drainage plan drawn to scale.
 - The positions and types of fittings, ventilation pipes, and inspection openings or other 'specials' that would be required.
 - The gradient of each portion of the drain.
 - A sketch of a selected structure or fitting that the candidate might reasonably be expected to construct in the normal course of his work.
 - Other sectional drawings that may be required.
 - Signs, symbols, and colours are used in the drawings to meet with job requirements.

5. General knowledge and understanding of sewer systems.

- Storm water and foul water systems.
- Combined systems.
- Separate systems.
- Storm water drain fittings, interceptor traps.
- Sewage tanks and septic closets.
- Understanding of decomposition of sewage and effluent disposal systems.

6. Drainage principles including testing and ventilation of drains.

- Principles related to drainlaying work.
 - Evaporation, transpiration, evapotranspiration, soakage, soil properties, head, hydrostatics and hydraulics, pressure, atmospheric pressure, full siphon, half siphon, flow, velocity, aerobic and anaerobic treatment, corrosion, expansion and contraction, friction, water valves.
- Planning of drainage – domestic and commercial, access to and cleansing of drains, inspection chambers, access chambers and other access openings.
 - Installation of inspection chambers, access chambers and other access openings.
 - Installation of drains.
 - Identification of drain defects and their rectification.
 - Installation of domestic waste interceptor traps.
 - Installation of trade waste interceptor traps.
 - Installation of sub-soil drainage.
 - Installation and maintenance of sumps.
 - Installation and maintenance of surface water collection systems.

- Installation of wet and dry inspection chambers.
- Installation of thrust, anti-scour, and anchor blocks.
- Installation and maintenance of effluent distribution chambers and disposal fields.
- Installation of storm water intake and outfall structures (i.e. wingwalls, culverts).
- Installation of retention and detention tanks, commissioning, and maintenance.
- Installation and maintenance of septic tanks.
- Installation of sewage pump stations.
- Identification, installation and maintenance of pumps, filters and controls for non-potable water supply and disposal systems.
- Installation of on-site wastewater treatment systems.
- Levelling, gradients, trenching, bedding of drains, back-filling, safety precautions for earthworks and excavations, the use of simple pumps.
- Air, water, coloured water, mirror, smoke, scent tests.
- Methods of ventilating with or without the use of an interceptor trap. Factors influencing flow of air and gasses through drains.

7. General knowledge and understanding of regulatory requirements relating to drainlaying.

- Knowledge of and ability to access and apply legislation, standards and codes of practice related to the design, installation and maintenance drainage systems and their components.
- Responsibilities in relation to provision of drainlaying services and insurance ramifications.
- Specific documents will be provided during the examination to examine this topic.

Legislation

Legislation that contains some requirements relevant to this paper.

These legislation and compliance documents can be downloaded for free from:

www.dbh.govt.nz

- The Building Act 2004
- The Building Code and Compliance Documents:
 - New Zealand Building Code Handbook
 - B2: Durability
 - E1: Surface water
 - G13: Foul water
 - G14: Industrial Liquid Waste

www.legislation.govt.nz

- Plumbers, Gasfitters, and Drainlayers Act 1976 (for 2010 examinations)
- Plumbers, Gasfitters, and Drainlayers Act 2006 (for 2011 onwards)
- Health and Safety in Employment Act 1992

- Health Act 1956
- Resource Management Act 1991

Standards

Refer to your training provider before purchasing these standards from www.standards.co.nz.

- AS/NZS 3500 Part 0:2003 Glossary of terms.
- AS/NZS 3500 Part 2:2003 Sanitary plumbing and drainage
- AS/NZS 3500 Part 3:2003 Stormwater drainage

Drainlaying Weighting

	Topic	Marks
1	Trade calculation	5
2	Materials, their properties and applications Tools and Equipment	10
3	Safety Precautions	10
4	Drawing	35
5	Sewerage Systems	10
6	Drainlaying Principles Drain Ventilation Testing Drains	20
7	Knowledge of and ability to access and apply legislation	10
	Total marks	100
	This weighting schedule is a recommendation and guide for tutors, examiners, moderators and candidates. It gives an approximate allocation of the emphasis given to topics in the examination.	