ASSESSMENT GUIDELINES

Unit 22204

Demonstrate knowledge of reinforced concrete requirements for use in landscape work.

Level 3, Credit 6, Version 1

Demonstrate knowledge of reinforced concrete requirements for use in landscape work.

Unit standard 22204
Level 3, Credit 6, Version 1

Level of performance required for this unit standard

This is a level 3 unit standard. At this level trainees are expected to demonstrate the following abilities when completing assessment tasks:

- To work under general supervision, with some independence; with significant responsibility for the standard of the outcome achieved.
- To apply technical skills and knowledge to complete the task to the specified standard, in a familiar context.
- To interpret available information, and use discretion and judgment.

Workplace assessment:

For guidelines on Workplace Assessment, please refer to the NZHITO Workplace Assessors Manual, and for further information, please contact: NZHITO, P O Box 8638, Christchurch.
Ph 03 9644 735, fax 03 9644 737, website www.hortito.org.nz

Special notes:

1. *Workplace procedures* refer to verbal or written instructions to staff on procedures for the worksite and equipment.
2. Legislation relevant to this unit standard includes but is not limited to the Health and Safety in Employment Act 1992, the Building Act 2004 and the Building (Forms) Regulations 2004.
3. The New Zealand Standards applicable to this unit standard are: NZS 3104:2003 *Specification for concrete production*, NZS 3109:1997 *Concrete construction,* NZS 3114:1987 *Specification for concrete surface finishes,* NZS 3124:1987 *Specification for concrete construction for minor works*, NZS 3113:1979 *Specification for chemical admixtures for concrete*, NZS/AS 1100.101:1992 *Technical drawing – General principles*, available from http://www.standards.co.nz.

Unit 22204: Demonstrate knowledge of reinforced concrete requirements for use in landscape work. (Apprentice copy)

ELEMENT	Competent	Range of evidence an assessor should consider
Element 1 Demonstrate knowledge of principles of reinforced concrete construction for landscaping.	**Yes/No**	▪ Describe reinforcing steel in terms of its function in compensating for the tensile characteristics of concrete in reinforced concrete construction. Range: characteristics – bending, torsion, shear. ▪ Show in clearly labelled freehand drawings the required placement and fixing of reinforcing to compensate for concrete in relatively low tensile strength in reinforced concrete features. Range: features – columns and piers, foundations, walls, floors. ▪ Describe concrete is terms of its functions in reinforced concrete construction. Range: functions – compression strength, protection of reinforcing, providing required shape, abrasive strength. ▪ Define the factors which govern the effective integration of concrete and reinforcing to attain the design strength of reinforced concrete, according to NZS 3124:1987. Range: factors – quality of materials, placement of reinforcing, concrete mix quality, concrete adherence to reinforcing, density of finished concrete, curing of placed concrete. ▪ Identify reinforced concrete structures in terms of whether or not they require consent under the Building Act 2004 and the Building (Forms) Regulations 2004, also identify the conditions under which an engineering certificate must be obtained for their construction.
Element 2 Demonstrate knowledge of the requirements of formwork for reinforced concrete construction.	**Yes/No**	▪ Identify the characteristics of sound formwork, describe each in terms of its importance in the construction of a concrete feature in accordance with drawings and specification. Range: characteristics – line, dimension, strength and rigidity, liquid retention, specified surface finish, non staining. ▪ Describe the requirements for removal of formwork in terms of ensuring that concrete reaches optimum strength, and that concrete and formwork are undamaged. Range: requirements – retention for curing period, use of release agents, use of release elements in construction, care in using tools. ▪ Give examples of concrete finishes with descriptions of how they may be obtained from formwork or developed after the removal of formwork in accordance with NZS 3114:1987. Range: finishes – patterns using elements fixed to formwork, specially constructed formwork; use of agents on formwork to retard concrete surface set; use of water, acid, and mechanical methods to remove or alter concrete surface after formwork removal.
Element 3 Sketch and label construction details for reinforced concrete features. Range: three of the following – walls, retaining walls; steps and ramps; columns, piers, and posts; storage features.	**Yes/No**	▪ Draw freehand drawings of cross sections through reinforced concrete features, showing formwork, reinforcing, and concrete components in place using identifying symbols and labelling conforming to NZS/AS 1100.101:1992. ▪ Draw freehand drawings of reinforced concrete features showing details of finishes, using identifying symbols and labelling conforming to NZS/AS 1100.101:1992. Range: fixings for other work, drainage, waterproof membranes, backfilling.

Element 4 Demonstrate knowledge of the requirements of concrete mixing, placement, protection, and clean-up procedures for reinforced concrete landscape features.	**Yes/No**	▪ Identify the elements in production of concrete to conform to NZS 3104:2003, giving a description of the requirements of each element. Range: requirements – material selection, material storage and proportioning, mixing times and procedures, slump and compression testing. ▪ Describe methods of placing concrete without damage to formwork, in terms of requirements for their satisfactory implementation. Range: methods – chutes, pumping, filling in layers, compaction. ▪ Describe in terms of the requirements for the implementation of each method, and NZS 3109:1997, the methods of protecting placed concrete to ensure that it reaches optimum strength and is not damaged by weather or other work. Range: methods – water ponding and spraying, curing agents, covering, pedestrian and vehicle barriers. ▪ List the elements of the work area to be cleaned-up on the completion of concreting work, identifying the implications of unsatisfactory cleaning-up procedures for each element. Range: elements – formwork, tools and equipment, surplus materials, fixings, reinforcing for further work extending from completed work.
Element 5 Describe the principles of concrete mix design and production in accordance with NZS 3124:1987.	**Yes/No**	▪ Define materials to produce concrete, in terms of their requirements to meet certified building standard. Range: water, cement, aggregates, admixtures. ▪ Define mix proportions to produce concrete mix to standard for use in general landscape work. Range: coarse aggregate, fine aggregate, cement, water. ▪ Describe the characteristics of concrete with too much or too little of each mix ingredient. ▪ Define the characteristics that admixtures, used to the manufacturer's requirements, give to concrete. Range: admixtures – water reducers, accelerators, retarders, colouring agents, air entrainers, plasticisers.
Element 6 Identify the material requirements for reinforced concrete landscape features. Range: at least three of – walls, retaining walls; steps and ramps; columns; piers and posts; storage features.	**Yes/No**	▪ Calculate from drawings or specifications the materials for construction of formwork for reinforced concrete landscape features, then select and order it in accordance with workplace procedures. Range: timber by size, grade, and lineal measure; formwork facing material by type, grade, size, and area; shutters by size, finish, and number; associated materials by size, number or length and type; fittings (spacers and ties). ▪ Calculate from drawings or specifications the reinforcing for reinforced concrete landscape features, then order it in accordance with workplace procedures. Range: unbent reinforcing by size and lineal measure; pre-bent reinforcing by size, detail of each piece, and number; welded fabric by gauge, mesh size, and area required; tie wire. ▪ Calculate from drawings or specifications materials for mixing of concrete required for reinforced concrete landscape features, then order it in accordance with workplace procedures. Range: ready mixed concrete by required volume and strength, concrete aggregate by volume required and grading size, cement by bag or tonne.

_____ *(Name of Apprentice)*

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Signed (Assessor): _____

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Please send this page to your NZHITO Regional Manager, who will forward it to National Office to register the credits on your NZQA Record of Learning.

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