Title	**Explain, monitor, and review piling equipment operations for onsite piling and deep foundation works**		
Level	**4**	**Credits**	**25**

Purpose	People credited with this unit standard are able to, for onsite piling and deep foundation works: – explain the features of the piling equipment and the operating process; – complete a task analysis for piling equipment; and – monitor and review piling equipment operations.

Classification	Infrastructure Works > Structural Foundations

Available grade	Achieved

Guidance Information

1 Learning and assessment within this unit standard must be carried out in a construction or infrastructure works environment in accordance with industry requirements and the following legislation, as relevant to the role, and any subsequent amendments:

- Health and Safety at Work Act 2015;
- Resource Management Act 1991;
- Heritage New Zealand Pouhere Taonga Act 2014;
- Hazardous Substances and New Organisms Act 1996;
- Traffic Regulations 1976;
- Land Transport Rule: Vehicle Dimensions and Mass 2016;
- Land Transport Rule: Heavy Vehicles 2004;
- *Structural Engineering Society New Zealand (SESOC), New Zealand Geotechnical Society (NZGS) Construction Specification Bored and Driven Piles 2022*, available from www.nzgs.org;
- *Excavation Safety: Good Practice Guidelines 2016,* available from Worksafe www.worksafe.govt.nz;
- *Operator Safety Manual for Earthmoving Machinery 2017*, available from Civil Contractors New Zealand https://civilcontractors.co.nz/.

2 Definitions

Industry requirements may refer to but are not limited to relevant policies, processes, methodologies, industry codes of practice, site specific health and safety plans, standard operating procedures, site safety plans, quality plans, work plans, traffic management plans, contract work programmes, job safety analysis, safe work method statements, job instructions, manufacturer's requirements, contract specifications, manuals, procedural documents.

Operating process may include but is not limited to – layout, levels, positioning, drilling shaft, reinforcing, casing installation and removal, tremie pour, over pour, piling, soil removal.
Quality plan refers to any contract specific policy, processes, procedures, testing or certification requirements.
Work plan refers to any job specifications or plans given to the operator prior to undertaking a job.

Outcomes and performance criteria

Outcome 1

Explain the features of the piling equipment and the operating process for onsite piling and deep foundation works.

Performance criteria

1.1 Model, type, and function of drill rig and piling equipment are explained in relation to conditions onsite, type of piling and deep foundation works, and the machine specifications or operator manual.

Range conditions onsite include – type and composition of soil, water table, rock layers, obstructions, access.

1.2 Advantages of the drill rig and piling equipment are explained.

Range range of use and safety requirements.

1.3 Capabilities of the drill rig and piling equipment are explained in terms of the relevant work plan.

1.4 Technological features are explained in terms of the model chosen to provide solutions for onsite works.

Range technological features include – sensors, camera function, global positioning system, reporting, tracking, and recording functions.

1.5 Sustainability features are explained in terms of analysing data on equipment and the job site to maximise productivity and reduce costs.

1.6 Operating process is explained in terms of the roles and responsibilities of the workers onsite and the tasks that need completing for that day.

1.7 Importance of the health and safety of the drill rig operator is explained.

Range health and safety includes – stress, panic, long distance travel to work, duration of work hours, fatigue, dehydration, regular breaks, nutrition, lack of focus due to repetition of job tasks or onsite delays, under or over confidence.

1.8 Type and composition of the pile and method of construction selected is explained.

Range operating process, work plan requirements, quality plan requirements.

Outcome 2

Complete a task analysis for piling equipment for onsite piling and deep foundation works.

Performance criteria

2.1 Daily piling rig operating tasks are discussed at morning briefings and confirmed in accordance with the work plan and site drawings.

2.2 Plant prestart checks and start-up procedures are confirmed in accordance with industry requirements and operator manual.

2.3 Access and stability considerations are confirmed to ensure a stable and safe platform for the piling equipment operations.

2.4 Safety attachments are checked in accordance with the operator manual, industry, and client requirements.

2.5 Site boundaries and blind spots are determined and communicated to the spotter or groundsman and workers in terms of safety and site awareness.

2.6 The safety and efficiency of the drill rig and piling equipment is checked throughout the operating process in accordance with the operator manual, and work plan.

2.7 Position of the drill rig and piling equipment are checked for correct positioning and operation.

2.8 Horn or communication device is used when turning, manoeuvring, tracking, or changing attachments.

2.9 Operation of the drill rig and piling equipment is checked in terms of avoiding stress on the plant and paying attention to changes in speed, noise, or any movement that indicates a different mode of operating or technique is required.

Outcome 3

Monitor piling equipment operations for onsite piling and deep foundation works.

Performance criteria

3.1 Pile depths are monitored and checked to identify issues in accordance with industry testing procedures.

3.2 Drill rig and piling equipment performance is monitored.

3.3 Soil content is monitored to check for change in consistency, level of moisture, or any other change that might suggest a different attachment, tooling or operating technique is required.

3.4 Set out and positioning are monitored in terms of working with the groundsman or spotter to make sure alignment is correct.

3.5 Piling equipment is monitored in terms of changes or modifications to attachments or replacement of worn parts.

3.6 Drill log or recording procedures are monitored and completed.

Outcome 4

Review piling equipment operations for onsite piling and deep foundation works.

Performance criteria

4.1 Recommendations for improvements to the safe and productive operation of the drill rig and piling equipment are documented.

4.2 Post-operational checks, shut-down procedures, and routine maintenance is completed and reviewed at the end of each day and any issues are communicated to the foreman or supervisor in accordance with industry and/or operator manual requirements.

Planned review date	31 December 2028

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	25 January 2018	31 December 2026
Rollover	2	29 September 2022	31 December 2026
Review	3	27 July 2023	N/A

Consent and Moderation Requirements (CMR) reference	0101

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact Waihanga Ara Rau Construction and Infrastructure Workforce Development Council at qualifications@WaihangaAraRau.nz if you wish to suggest changes to the content of this unit standard.