

RECOGNITION OF SPECIALIST SKILLS FOR HORIZONTAL DIRECTIONAL DRILLING

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ABSTRACT

Horizontal Directional Drilling (HDD) has become established as an important trenchless technology with wide application in New Zealand. Like all sophisticated technologies, the benefits of HDD are best realised, and risks minimised, when staff are fully trained.

InfraTrain New Zealand is the Industry Training Organisation (ITO) for the civil infrastructure industry. In 2009, InfraTrain completed a major review of its HDD qualifications. The result was a completely updated qualification with specialist strands that recognise the skills of Driller, Tracker and Site Supervisor roles. This paper will discuss the benefits of the nationally-recognised qualification and the role the water industry needs to play to achieve them.

The National Certificate in Civil Construction Works (Horizontal Directional Drilling) provides a means by which councils, consultants and utility owners can specify a minimum standard of skills and knowledge for HDD work. However, the ITO believes that organisations specifying and commissioning HDD work need to look beyond company and equipment attributes to the skill levels of staff actually performing the HDD work. While contracts have no specified skill levels, there will be little incentive for HDD companies to upskill.

KEYWORDS

Horizontal Directional Drilling, HDD, trenchless technology, skills, qualification, InfraTrain

1 INTRODUCTION

Horizontal Directional Drilling (HDD) has become established as an important trenchless technology with wide application for the installation of new water and waste utilities in New Zealand. It has advantages, particularly in



built-up or sensitive areas where trenching is not possible or would cause major disruption. In many situations HDD can offer a cost advantage for installation of water utilities.

The capability of HDD equipment ranges from installation of services under roadways through to projects such as the recent installation of a 950m length of 560mm sewer pipe for the North Shore City Council's Birkdale sewer project.

Like all sophisticated technologies, the benefits of HDD are best realised, and risks minimised, when staff are fully trained.

2 RECOGNITION OF SKILLS

InfraTrain New Zealand is the Industry Training Organisation (ITO) for the civil infrastructure industry. InfraTrain arranges and facilitates workplace learning and skills development to enable staff to work safely, competently, and in line with industry best practice. InfraTrain provides recognition of their skills and knowledge with a range of national qualifications which are developed with the industry to meet their needs.

In 2004 InfraTrain developed, in consultation with the trenchless industry, two national certificates for HDD:

- National Certificate in Civil Construction Works (Horizontal Directional Drilling) with strands in Driller and Tracker Level 3
- National Certificate in Civil Construction Works (Horizontal Directional Drilling Site Controller) Level 3

Qualifications such as these are registered on the National Qualifications Framework and administered by the New Zealand Qualifications Authority (NZQA). ITOs are required to review the qualifications on a regular cycle to ensure they continue to be relevant and meet the changing needs of industry and technology. InfraTrain completed a major review of these HDD qualifications in 2009.

3 QUALIFICATION REVIEW

Initial discussions with the trenchless industry determined that the horizontal directional drilling qualifications registered in 2004 were no longer fit for purpose. An Industry Advisory Group (IAG) of HDD practitioners, including qualification assessors, reviewed the qualifications and the unit standards relating to HDD to ensure they were still relevant to industry needs and new developments. Proposed changes were circulated to the industry for comment and feedback from this consultation was incorporated into the review.

3.1 REVIEW CONSIDERATIONS

As part of the review, the IAG considered other trenchless technologies (HDD is only one such technology) and how these might be catered for in the qualifications InfraTrain offered. While the qualification review proceeded with a continued focus on HDD, it was suggested that in future reviews InfraTrain would need to consider the specialist skill needs of these other trenchless technologies.

From industry feedback and discussions with the IAG, it was clear that only one core qualification would be required to cover HDD-specific skills such as preparing for HDD operations, knowledge of fluids, carrying out bore exit and pipe entry tasks and restoring the site.

The IAG recognised that service strikes were a risk factor in the industry (and a gap in the existing qualifications) and so developed a unit standard to cover knowledge and skills in strike avoidance and response. A compulsory unit standard in health, safety and environmental legislation was also added. Options within the elective section of the qualification would cover further skills and knowledge suited to the trainee's particular work requirements.

The IAG also determined that the updated qualification should support the distinct roles of driller, tracker and/or site supervisor through elective strands; the content of each strand including skills and knowledge specific to each role, as well as knowledge such as communications with other staff and the public on site.

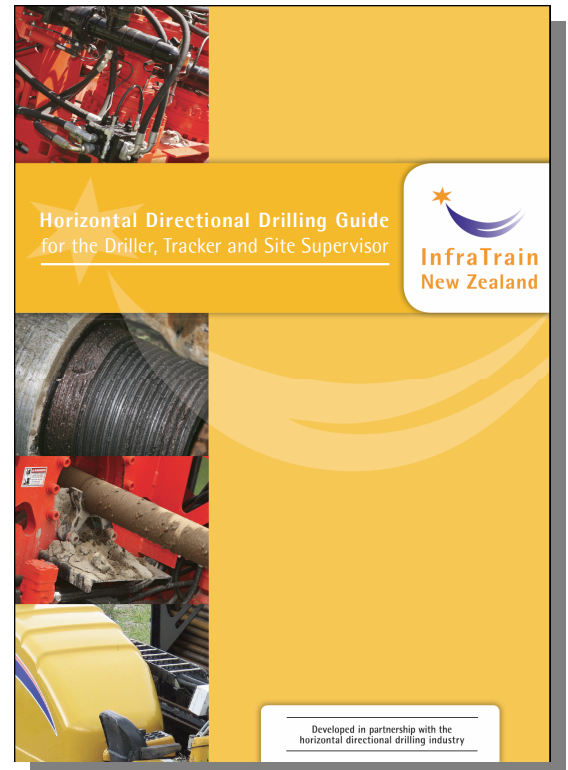
3.2 RESOURCE DEVELOPMENT

The IAG requested the new qualification be supported with a learning resource covering the three HDD roles. The *Horizontal Directional Drilling Guide for the Driller, Tracker and Site Supervisor* was therefore developed, covering key responsibilities for each of the driller, tracker and site supervisor roles, as well as essential information for HDD operations.

Trainee Assessment guides for each of the unit standards were also developed. These outline:

- what the trainee needs to do to achieve the unit standard
- a checklist of evidence required
- reference materials and legislation the trainee should refer to e.g. Resource Management Act 1991
- practical tasks the trainee needs to have completed such as ‘prepare equipment and materials for the pilot bore’, or
- theory questions the trainee needs to answer to demonstrate knowledge, such as ‘What are your company procedure and systems for delivering HDD fluids’.

As part of InfraTrain’s quality assurance process, each of these Trainee Assessments was given a ‘pre-assessment moderation’ check. This is carried out to ensure that each assessment is aligned with the unit standard and that the evidence required of each assessment will be sufficient, valid and consistent.



Sample trainee assessments and the HDD Guide were also trialled with trainees and industry experts to ensure they were fit for purpose and met industry’s needs. Overall the feedback was positive, with only a few amendments required, which confirmed the value of rigorous industry consultation and the use of smaller writing groups to develop material.

4 QUALIFICATION OUTLINE

The updated National Certificate in Civil Construction Works (Horizontal Directional Drilling) was launched in September 2009. It is a Level 3 qualification, made up of unit standards totaling 50 credits. Each of these unit standards describes knowledge and skills that the candidate must demonstrate competence in. It is expected that the national certificate will take 12 months to complete.

The qualification comprises core compulsory and elective unit standards, plus an elective strand. The core compulsory units cover:

- Preparation for HDD operations and site restoration
- Bore exit and pipe entry tasks



- Strike avoidance and strike response
- Health, safety and environment requirements

The core elective section provides a wide choice of units which can be selected to suit job requirements and these cover:

- First Aid
- Civil plant operation and management
- Civil construction works
- Civil construction supervision
- Health, safety and environment
- Temporary traffic management

The qualification is completed with a minimum of one of the following elective strands:

- Driller strand
- Tracker strand
- Site Supervisor strand

It is strongly recommended that trainees selecting the Site Supervisor strand have experience as a Tracker and a good understanding of the Driller's role.

5 HOW THE QUALIFICATION IS ACHIEVED



The National Certificate in Civil Construction Works (Horizontal Directional Drilling) is a competency-based qualification and is completed through the recognition of relevant work skills and knowledge, as these are gained on the job. The candidate collects evidence of this work experience and off-job training in a Workbook, for verification by a Verifier and then assessment against the unit standards by an InfraTrain approved Assessor.

All of the unit standards can be achieved on-job, apart from the elective First Aid units which are delivered off-job by a training provider.

5.1 THE WORKBOOK

The Workbook is provided by InfraTrain and contains sufficient information to guide the candidate through the process of achieving the qualification, together with Trainee Assessment guides for the unit standards the trainee is enrolled in.

The theory questions and practical tasks in these guides, together with any other evidence, make up the assessment evidence for the qualification. The trainee provides answers to the theory questions and has a Verifier observe and sign off the completion of the required practical tasks. The evidence that needs to be collected, such as photographs or work records that help demonstrate competence is also compiled in the Workbook. The Trainee also compiles a Job Record, including any new skills gained, problems encountered and how they were resolved and the unit standards the work relates to.

6 THE INDUSTRY'S ROLE

A number of people in the industry play a key role in the trainee achieving this qualification.

6.1 EMPLOYER

While achievement of the qualification does depend on a commitment by the trainee to complete the workbook, it also depends very much on the support of the employer to provide the opportunities and resources to complete the requirements for the qualification within the prescribed timeframe.

6.2 MENTOR

It is recommended that a mentor is assigned to the trainee to provide support and guidance. They may be a colleague, supervisor or manager.

6.3 VERIFIER

The verifier is a technical expert in the area and also knows the trainee's work performance well enough to be able to attest to their consistent performance in the task(s) being undertaken. In most cases the verifier will be the trainee's supervisor.

For written answers, the verifier ensures that the evidence is the trainee's own work and that all questions have been answered. The verifier does not check that answers are correct.

For practical assessments, the verifier ensures that the work has been carried out correctly.

6.4 ASSESSOR

The assessor is a person registered with InfraTrain who is authorised to assess specific unit standards. These unit standards form the assessor's scope.

The assessor evaluates evidence, forms a decision, and advises InfraTrain when the trainee is 'competent'.

While the evidence and other information in the Workbook provides a substantial amount of the information for assessment, the Assessor may also confirm work with the Verifier, observe the candidate working or interview the trainee.

Once the Assessor has evaluated the trainee's performance and knowledge and determined they are competent against the Unit Standards, the Assessor will advise the trainee and InfraTrain, who notify the New Zealand Qualifications Authority.

6.5 INFRA TRAIN REGIONAL ADVISOR MENTOR

A Training Advisor from one of InfraTrain's regional offices will support the employer and trainee right through the whole process. The advisor:

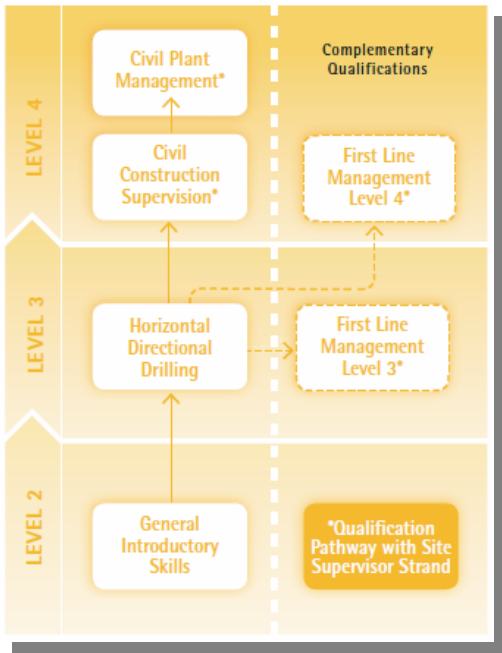
- helps plan training
- helps arrange the verifier
- sets completion targets with the employer and trainee
- makes regular progress reviews
- advised and arranges any off-job training



- provides support and guidance
- co-ordinates assessment.

7 QUALIFICATIONS PATHWAY

InfraTrain’s qualifications are designed to provide pathways, particularly to higher level qualifications. While the National Certificate in Civil Construction Works (Horizontal Directional Drilling) is a stand-alone qualification with no pre-requisites, it does provide a pathway with other InfraTrain civil infrastructure qualifications.



The qualification may follow on from the National Certificate in Civil Infrastructure (General Introductory Skills).

People who complete the Site Supervisor strand may wish to progress to:

- National Certificate in Civil Plant Management (Level 4)*
- National Certificate in Civil Construction Supervision (Level 4)*
- National Certificate in Business (First Line Management) (Level 3 or Level 4).

* NOTE – The qualification pathway will change, as these qualifications have been reviewed and will be replaced by new supervision qualifications (Level 4 and Level 5). It is planned to release these by December 2010.

8 MODERATION – QUALITY ASSURANCE

The process of Moderation is an important part of InfraTrain’s quality assurance programme and provides candidates with the confidence that they will be assessed against the Unit Standards to the same consistently high standard wherever they are in the country.

The peer moderation model is used by InfraTrain for the national certificate and this involves all Assessors reviewing assessment samples to check the right level of competency is being achieved by candidates. There is an active network of Assessors throughout the country which facilitates the sharing of information and encouraging consistency in assessments.

9 QUALIFICATIONS – SETTING SKILL STANDARDS

The rigorous review process for qualifications establishes skill standards that reflect industry best practice and incorporate health, safety and environmental compliance requirements for the work. A national qualification recognises that a person is competent in the required skills and knowledge.

The HDD qualification provides an assurance the person is not only competent in the specialist HDD technical skills, but can operate safely on a drilling worksite, and has the skills to operate effectively as part of a HDD team. For the employer there are well-proven benefits in training with lower costs and higher productivity as a result of less disruption, fewer accidents and errors (such as service strikes in the case of HDD).



Qualifications can clearly provide asset and utility owners with an assurance the contractor has a trained and skilled workforce that can deliver the prescribed quality standards in a contract and meet compliance requirements. In the case of underground utilities there is a risk factor with inaccuracies that can occur in ‘as-built’ plans. It should therefore be mandatory to use a contractor with recognised skills who can minimise the risk of collateral damage, which can cause substantial disruption to businesses and communities, as well as raising issues of cost liabilities.

An HDD contractor with recognised skills provides an assurance to the asset owner that they are also proficient in other key areas of HDD operations, such as the ‘pullback’ of piping within its design loads, site management to minimise disruption, and site reinstatement.

The costs of poor quality installation work and defects, whether borne by the contractor or asset owner will be reflected in costs somewhere – in the case of contractors, this will inevitably impact on future pricing. Poor quality is also likely to impact on future maintenance and whole-of-life costs of the utility.

The National Certificate in Civil Construction Works (Horizontal Directional Drilling) provides a means by which councils, consultants and utility owners can specify a minimum standard of skills and knowledge for HDD work. However, while there is no requirement for skill levels and qualifications in contracts, councils and utility owners will not gain the quality and productivity benefits of a skilled workforce.



There is currently little incentive for HDD companies to invest in skills, particularly with existing procurement practices that do not sustain workforce development. While InfraTrain has the capability and experience to work with the HDD industry to develop these skills, the ITO believes that those organisations specifying and commissioning HDD work need to take a leadership role in looking beyond company and equipment attributes to the skill levels of staff actually performing the HDD work.

