

DISCIPLINARY COMMITTEE – UPHELD COMPLAINTS LESSONS TO BE LEARNT

CASE STUDY
NOVEMBER 2022 – RETAINING WALL

INTRODUCTION

Engineering New Zealand receives around 50 concerns and complaints about Chartered Professional Engineers and members each year.

Not all complaints are upheld, but they typically relate to:

- miscommunication,
- inattention to client care,
- a misunderstanding over what the engineer has been engaged to do (or what they can't do),
- serious issues of competence, or
- ethical conduct.

Reflections on past complaints that an Engineering New Zealand Disciplinary Committee has upheld can offer valuable lessons for engineers.

We will review an upheld complaint from a past Disciplinary Committee decision every two months. The purpose of this project is not to name and shame, but to provide information so we can learn and grow. Wherever possible, we have anonymised the case.

We invite you to reflect on the lessons to be learnt.

Background

The complainant in this case was a City Council employee. The complaint related to the competence and ethical conduct of the respondent engineer, as illustrated by three representative instances of their work.

This case will focus on one of the three instances identified by the complainant relating to deficiencies in the respondent's approach to geotechnical analysis and documentation and an unwillingness to accept advice and recommendations from the City Council and independent peer reviewers.

The engineer stated they had based their design upon a geotechnical report. However, no geotechnical engineer had been engaged, and the only report available was an initial survey undertaken on behalf of the EQC. That report stated that a geotechnical engineer should be engaged to assess ground stability and design and manage remedial works.

Property A – Retaining Wall

The property was affected by a weather event, which resulted in a tension crack opening and movement of the land – in effect, a landslide. The effects of this land movement were such that the property was immediately deemed uninhabitable, and a notice preventing occupation was issued on the property.

To address the resulting effects of the land movement, an anchored retaining wall scheme was designed to extend across the front of the property.

No soil testing was initially undertaken. After being queried by the Council about ground conditions at the site, the engineer undertook two scala penetrometer tests.

When the Disciplinary Committee reviewed the respondent's design calculations and sketches for the retaining wall at the property, it queried these calculations.

It was apparent there were some fundamental soil mechanic errors, and the design calculations presented were flawed. The engineer concerned was a Chartered

Professional Engineer (CPEng), with Civil and Structural (not Geotechnical) as their practice fields.

It was noted that the respondent's PS1 for the anchored retaining wall stated that the wall had been designed in accordance with compliance documents issued by MBIE and referenced B1/VM1. However, there is no verification method in the Building Code for anchored retaining walls.

Key issue

Did the engineer meet the competency standards expected of a reasonable engineer in providing engineering services and work outside their area of competence?

Decision

The Disciplinary Committee found:

- the engineering services provided by the respondent in the documentation for each of the three properties showed insufficient site-specific investigation and analysis.
- there were significant gaps and errors in the overall approach, and the work raised significant questions about the respondent's skill and competence in geotechnical engineering.
- the respondent did not meet the standard expected of a Chartered Professional Engineer and Chartered Member of Engineering New Zealand.

DRAWINGS

Figure 1: Site plan including crack area

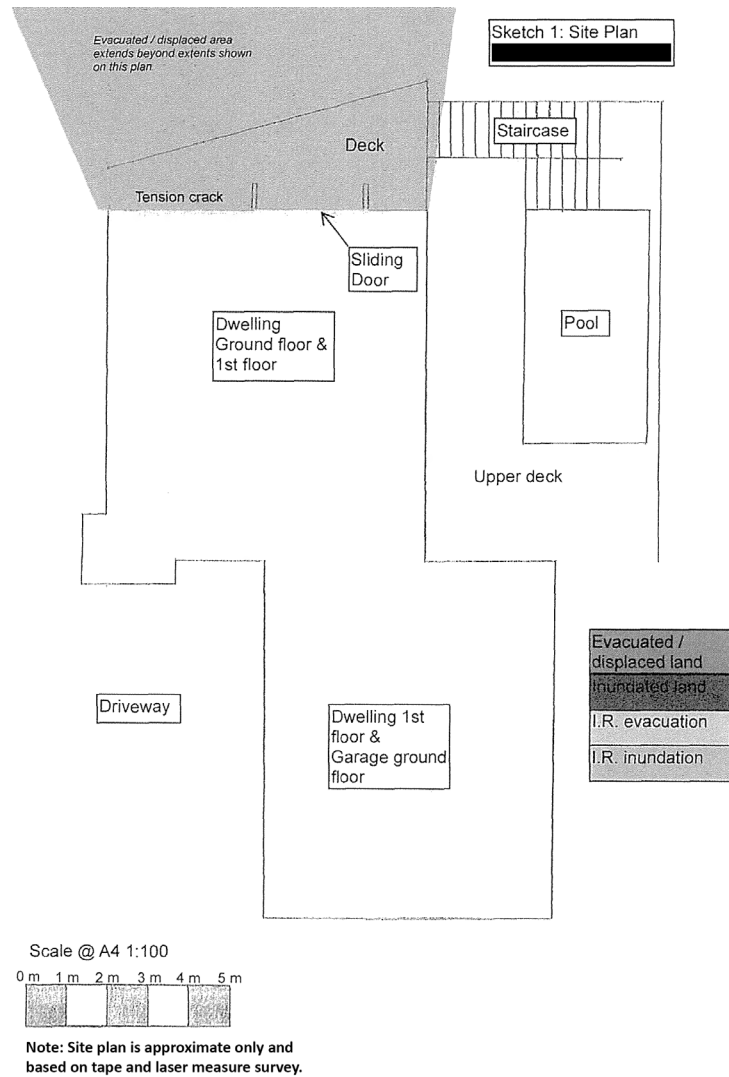


Figure 2: Section of slip

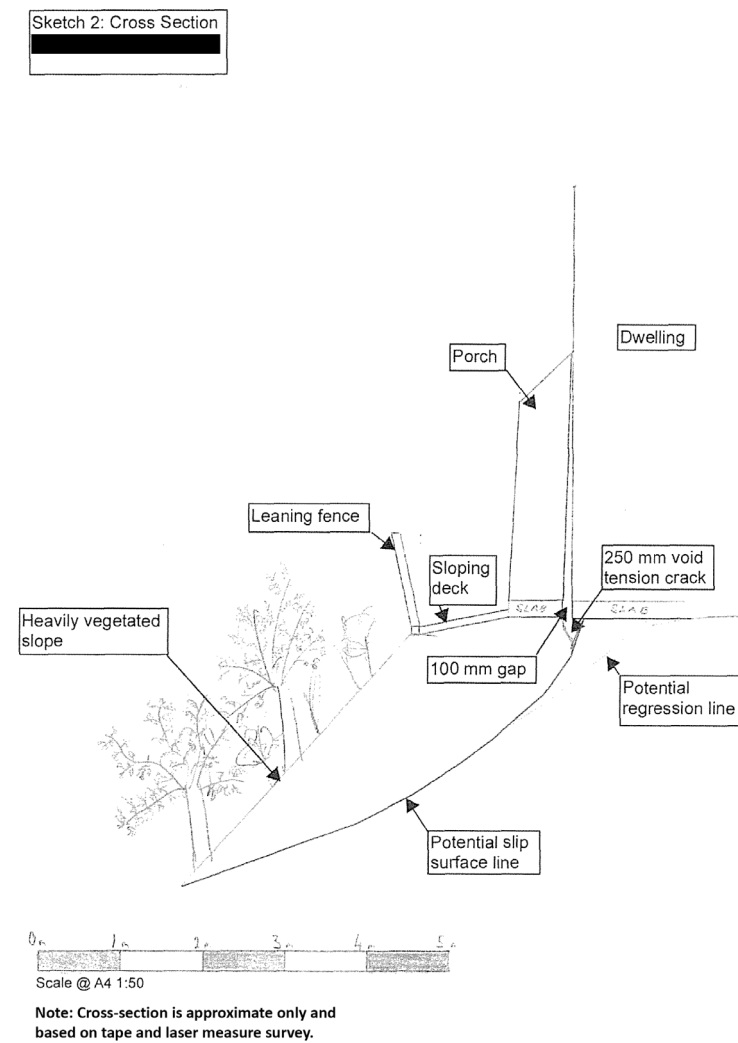


Figure 3: Proposed wall location

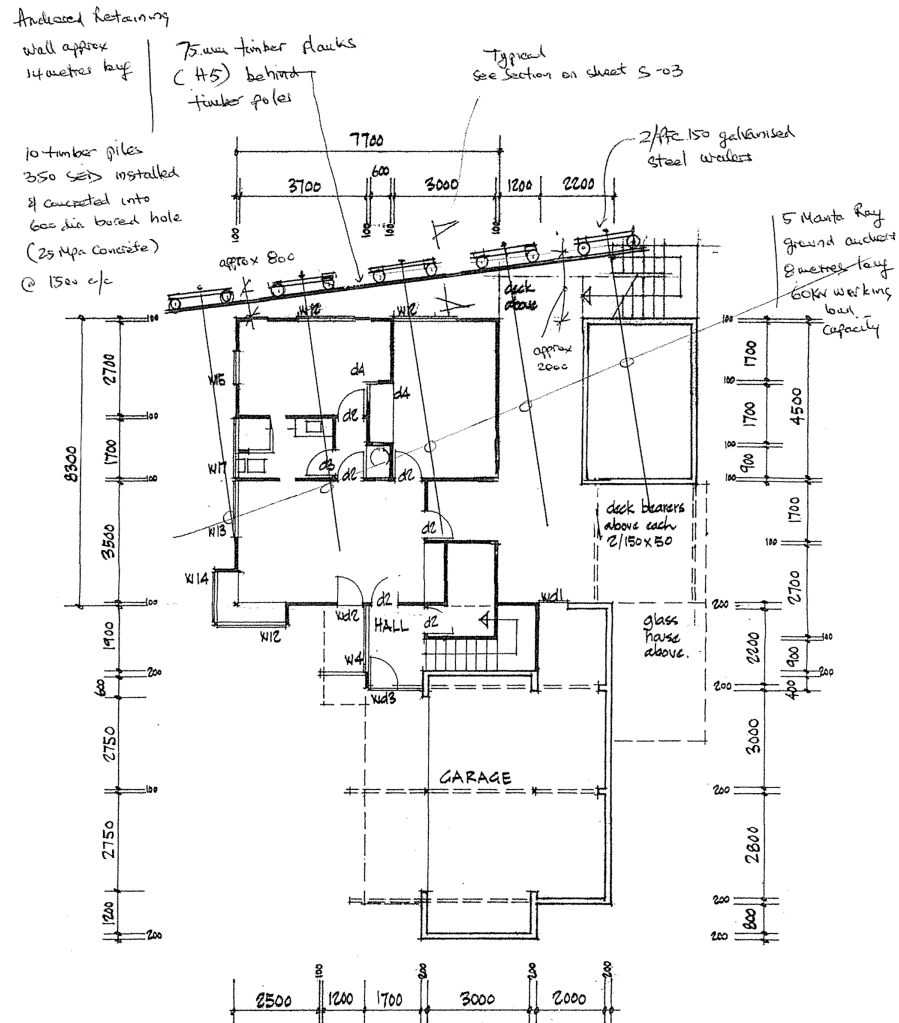
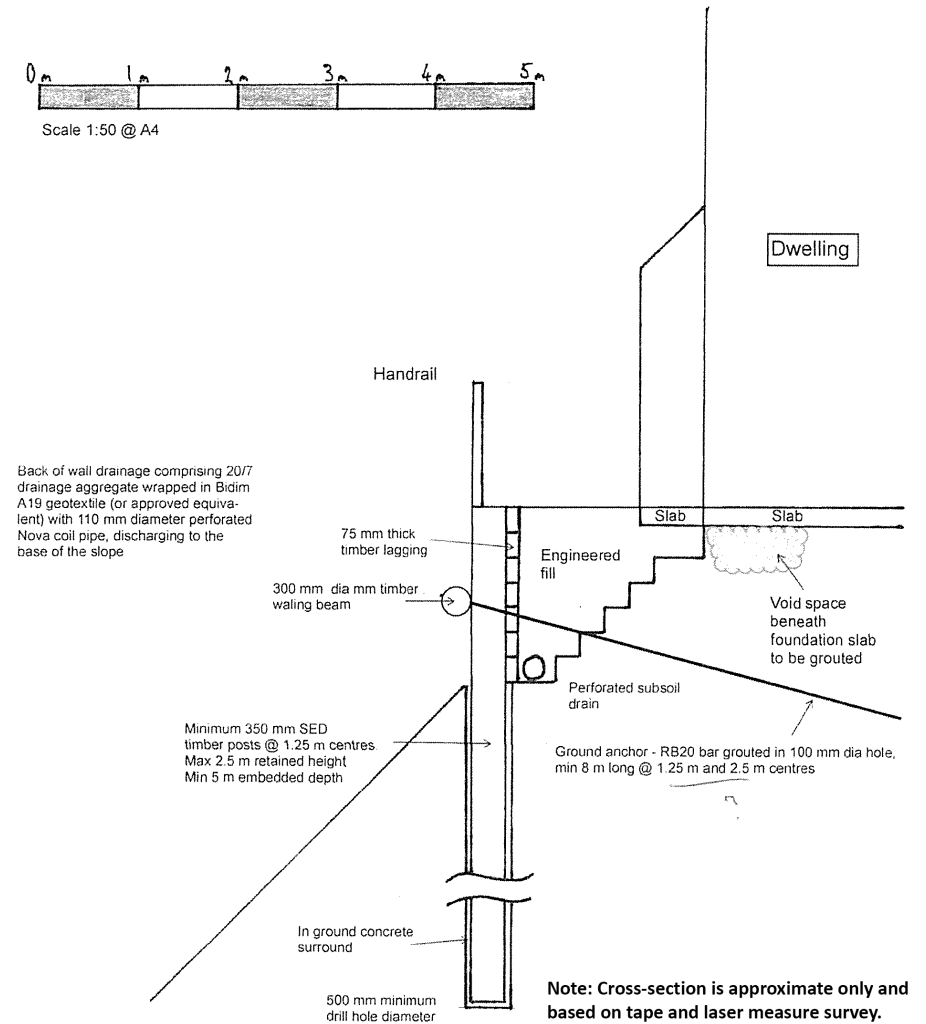


Figure 4: Proposed wall section



YOUR REFLECTION

Based on the information provided, consider your answers to the following two questions:

If you were engaged to resolve the problem, how would you do so? How would you ensure you were acting within your [bounds of competence](#)? Are you aware of the [Geotechnical input flowchart](#) on the [Engineering New Zealand guidelines](#) page?

How would you have stopped this from occurring in your own company?

AN EXPERT'S VIEW

Risk assessment

First, we need to assess risk. What can go wrong? In this case, there is a possible loss of structural integrity and possible risk of injury/death to occupants if the structure was inhabited. That puts the risk level as high.

Information available

Is there enough information for me to review and develop potential solutions?

In this case, there is very limited geotechnical data. For example, some of the information needed would be:

- soil properties,
- sub soil conditions,
- effects of the water table,
- global stability issues, overland flow paths,
- steep banks. past slope failures,
- details of existing structure, and
- foundations

Competence

Some of my options

Always consider whether you are competent to carry out the design.

Who can you discuss the issue with if you're at all unsure? Should this be given to a competent Geotech engineer, or is it something that you can do with close collaboration with a Geotech engineer?

With enough good information and advice from the Geotech engineer, could you produce a suitable structural model, perhaps a propped cantilever with loads and capacities? For quality assurance, you would probably want to run it past the Geotech engineer again for a review once the design was finished.

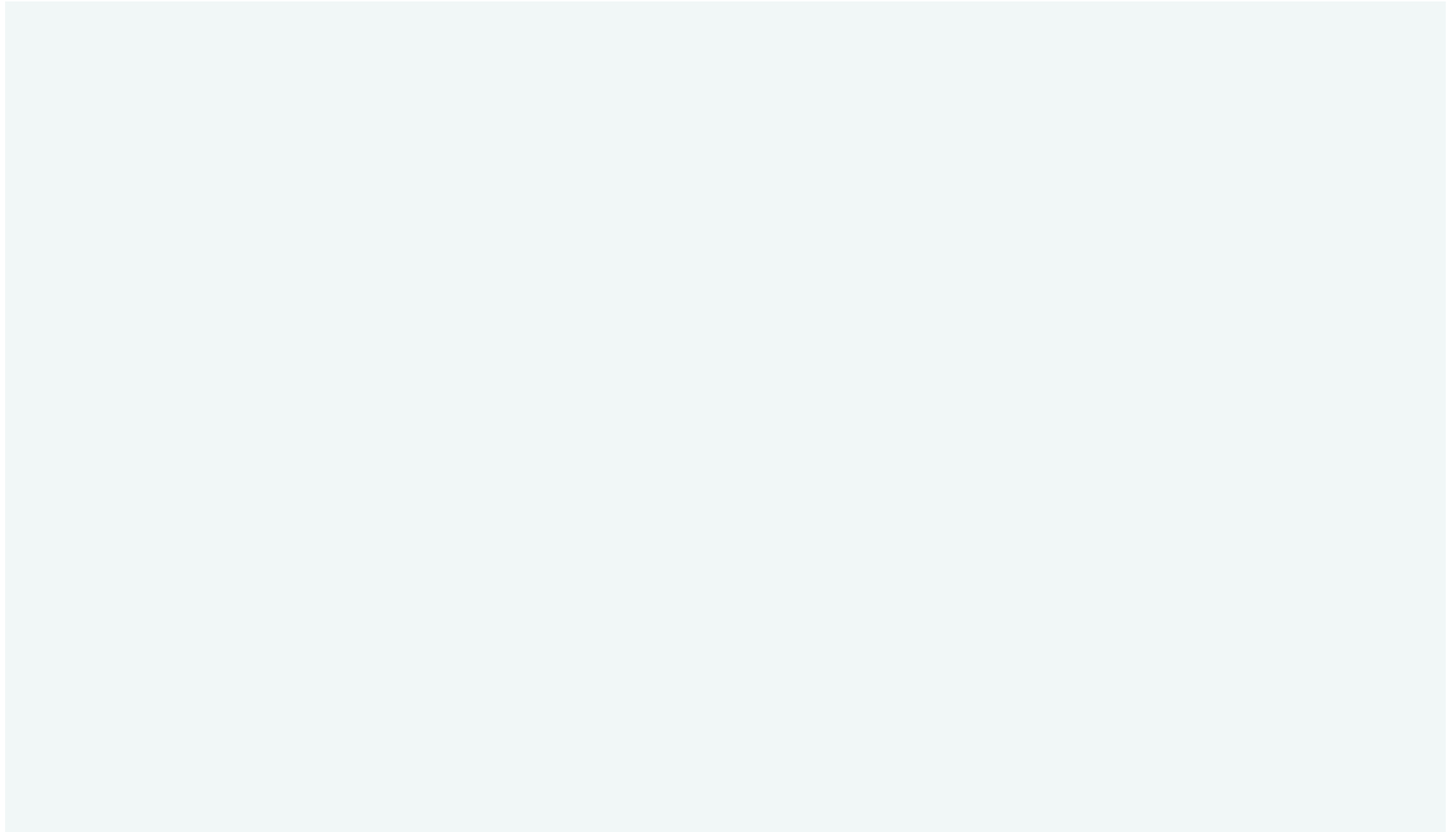
Understanding your bounds of competence

How do you know if you're competent? What resources are there to help with that decision?

Engineering New Zealand has a good article on understanding your [competence](#). In this case, you could also reference the [geotechnical input flowchart](#) – this quickly becomes obvious an experienced geotechnical engineer should have been engaged or overseen this project.

LESSONS TO BE LEARNT

What lessons can be learnt after reflecting on this upheld complaint?





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