29 November 2024

Waikato District Council

Building Administrator

Anne Saunders

BLD 0046/25 – 13A Havelock Road, Ngaruawahia – Stormwater Soakage

Dear Anne

I have been engaged by Malone Harris to provide construction monitoring services for the above stormwater soakage, such as to fulfill the Building Consent conditions for BLD 0046/25.

Part of this work is to understand the design approved in the stamped / approved set of consented documents.

The approved plans show a *5.5mL x 3.0mW x 2.0mD soak-pit as per Geotek Engineers Report* (n.b. – spelling is as per the approved plan).

The Geotechnical Engineer's Report, approved by Waikato District Council as part of the Building Consent documentation contains errors, in my opinion, regarding the stormwater soakage design. Namely (*italic blue are my comments*):

- The body of the report provides a table indicating 120m^2 of roof (with a run-off coefficient of 90), 0m^2 of driveway, and 800m^2 of grass (with a run-off coefficient of 35). Note 1 indicates Run-off coefficients from Building Code E1/VM1. *E1VM1's run-off coefficients are decimals <= 1.0, not whole numbers >1.0. This coefficients are more in line with Curve Numbers used in Auckland's TP108.*
- The body of the report indicates driveway water will be diverted by a kerb and channel to a cesspit. The cesspit will be piped to the soak pit. *The driveway etc. does not appear in the design calculations. Nor does it contribute to the catchment area draining to the soak pit.*
- The body of the report advises a soakage test was undertaken with a 2.0m deep x 150mm dia. soakage bore. The soakage test provided a minimum soakage rate of 0.15 L/m2/min. *The units of this soakage rate are inconsistent with E1/VM1. This soakage rate is more in line with soakage design methods within the Auckland Soakage Design Manual.*

- The calculations state the soakage pit design uses the design method from E1/VM1. *Note the "M" missing from the title of their design calculations.*
- The design calculation indicates the 10% AEP 1 hr intensity would be used. However, a rainfall intensity of 109mm/hr is used in their design calculations. *A 10% AEP / 1 hr intensity is more in the 40-50mm / hr for the Waikato region. This is the correct storm duration to be used in the E1/VM1 method. 109mm/hr would be typical for a 10%AEP / 10 min duration storm intensity.*
- The design uses only 120m^2 of roof with a run-off coefficient of 0.98. *The design areas and coefficients are different to the body of the report. The run-off coefficient is not consistent with run-off coefficients used in E1/VM1 tables 1 and 2. The 0.98 value is comparable to a CURVE NUMBER (CN = 98) used in Auckland Council's TP108, then adjusted to fit in with E1/VM1's coefficients ranging between 0 and 1.0. The CN of 98 is for impermeable surfaces in Auckland's TP108 method. The designer, in their calculations, appears to mix up design parameters from different hydraulic and soakage design methods.*
- The soakage rate of 8.88mm/hr is advised. *The design calculations do not show how this value is arrived at. The units are consistent with E1/VM1. The value of 8.88mm/hr is orders of magnitude below typical soakage obtained using E1/VM1. An experienced stormwater designer would not use soakage if the E1/VM1 soakage rates were this low.*
- The soakage test indicates 4 hours of monitoring measured at 15-minute intervals. The drops start at 400mm per 15-minute increment, decrease down to 95mm at 3hrs 15 min., then increase up to 115mm at 4 hours. *This is inconsistent with the E1/VM1 soakage test method. If 95mm was the drop over 15 minutes, than over an hour the drop would be 380mm/hr, not the 8.88mm/hr reported in their design calculations.*
- Summing the drops, the total drop is greater than the 2.0m depth of the hole. *This is inconsistent with the E1/VM1 soakage test method. On telephoning the designer to learn how they had undertaken their test, they advised they topped up the hole with water every 15 minutes, then observed the drop over the next 15 minutes. This is NOT the soakage test method used in E1/VM1.*
- The soakage calculations give a parameter of average water depth in the hole (1.943m) and a perc rate calculation of (1000 D M) /4d = 0.15 litres/m^2/min ; Sr = 8.88mm/hr. *This is NOT how E1/VM1 calculates the soakage rate.*

In my opinion, there are too many errors, and too many mixtures of design inputs from different design methods, such as to call this design competent.

I refer to the PS1 for the on-site stormwater disposal offered by the Engineering Geologist. On the Waikato Building Group's PS1 – Design Statement, and note that the designer has:

- said the design was to "schedule E1" *Is this just to the Building Code E1 clause (not schedule), or to a MBIE acceptable solution, or to a verification method?*
- ticked the box saying they have sighted the Building Consent and read Advisory notes. *The PS1 is dated 27/5/24 and the Building Consent was issued 21 August 2024. How could the designer have seen the building consent and advisory notes prior to issue?*

These two items on the PS1 might have been an indicator that the design needed to have closer scrutiny, if it was that the PS1 was the only document used in Council's determination of if the design complied with the NZ Building Code.

I have spoken with the Geotechnical Engineer / Geologist that designed the soak pit, and advised that, in my opinion, their design method was inconsistent with E1/VM1. I have asked him to review the E1/VM1 design method, and I will follow up with him again to see what conclusions he has reached, or how they justify their presented design complies with E1/VM1.

In providing advice for Malone Harris, I have completed a correct E1/VM1 soakage design, using soakage rates of 400mm/hr (consistent with the soil log investigation showing sands and course sands), and advised him the 5.5m x 3.0m x 2.0m deep soak hole is more than adequate for the 120m^2 house. Hence the consented design will comply with the New Zealand Building Code. I also advised Mr. Malone that there would be an option to apply for a building consent amendment for a smaller soakage pit. However, it was decided that it would be too time consuming to effect this change, and so we were to continue with the stamped/approved soakage pit.

When on-site, I was shown the existing stormwater connection and learned that this new building was to replace a similar building that had been destroyed by fire. Instead of constructing a new soak-pit, the new building could have simply been connected to the existing connection, as per the existing dwellings at 13b and 13c that also use the stormwater connection. This would have fulfilled the Geotechnical Engineer's assumption in the body of the report, that hydraulic neutrality had to be achieved. It would have also saved resources.

In obtaining the documentation to complete my task of providing Construction Monitoring, I was also given a letter by the Geotechnical Engineer to questions raised by

the Council in relation to stormwater. The response letter is titled Re*: Building Consent (BLD 0046/25) for Malone Harris – 13C Havelock Road, Ngaruawahia* and dated 24 July 2024. The answers in the letter reflect questions being raised with regard Waikato District Council's District Plan(s). There does not appear to be any questions/answers in relation to the New Zealand Building Code, or MBIE's Acceptable Solutions and Verification Methods. One would hope the BCA does check that designs submitted for consent align with the New Zealand Building Code and MBIE compliance documents.

Regards

Kenneth Harry Bowkett

BE (Civil) Hons, CPEng, CMEngNZ

CPEng # 193728

12 Cherie Close

Ph 021 853 049

Building Code Clause(s) E1

PRODUCER STATEMENT – PS4 – CONSTRUCTION REVIEW

ISSUED BY: Kenneth Harry Bowkett
(Construction Review Firm)

TO: Malone Harris
(Owner/Developer)

TO BE SUPPLIED TO: Waikato District Council
(Building Consent Authority)

IN RESPECT OF: Stormwater soakage disposal
(Description of Building Work)

AT: 13A Havelock Road Ngaruawahia
(Address)

Town/City: Ngaruawahia **LOT** 13 **DP** 6825 **SO**
(Address)

We Kenneth Harry Bowkett have been engaged by Malone Harris
(Construction Review Firm)

To provide ☒ CM1 ☐ CM2 ☐ CM3 ☐ CM4 ☐ CM5 (Engineering Categories) or ☐ observation as per agreement with

owner/developer Malone Harris

or ☐ other .....services
(Extent of Engagement)

in respect of clause(s) E1 of the Building Code for the building work described in

documents relating to Building Consent No. BLD 0046/25 and those relating to

Building Consent Amendment(s) Nos. N/A issued during the course of the works. We have sighted these Building Consents and the conditions of attached to them.

Authorised instructions/variations(s) No. N/A (copies attached)
or by the attached Schedule ☐ have been issued during the course of the works.

On the basis of ☒ this review ☐ these review(s) and information supplied by the contractor during the course of the works and **on behalf of the firm** undertaking this Construction Review, **I believe on reasonable grounds** that
☐ All or ☒ Part only of the building works have been completed in accordance with the relevant requirements of the

Building Consent and Building Consent Amendments identified above, with respect to Clause(s) E1
of the Building Code. I also believe on reasonable grounds that the persons who have undertaken this construction review have the necessary competency to do so.

I, Kenneth Harry Bowkett am: ☐ CPEng.# 193728
(Name of Construction Review Professional)

I am a member of: ☒ Engineering New Zealand and hold the following qualifications BE Civil (Hons) , CPEng , CMEngNZ

The Construction Review Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than $200,000*.

The Construction Review Firm is a member of ACE New Zealand: ☐

SIGNED BY Kenneth Harry Bowkett (Signature) 
(Name of Construction Review Professional)

ON BEHALF OF Kenneth Harry Bowkett Date 29/11/24
(Construction Review Firm)

Note: This statement shall only be relied upon by the Building Consent Authority named above. Liability under this statement accrues to the Design Firm only. The total maximum amount of damages payable arising from this statement and all other statements provided to the Building Consent Authority in relation to this building work, whether in contract, tort or otherwise (including negligence), is limited to the sum of $200,000.*

This form is to accompany **Forms 6 or 8 of the Building (Form) Regulations 2004** for the issue of a Code Compliance Certificate.

GUIDANCE ON USE OF PRODUCER STATEMENTS

Producer statements were first introduced with the Building Act 1991. The producer statements were developed by a combined task committee consisting of members of the New Zealand Institute of Architects, Institution of Professional engineers New Zealand (now Engineering New Zealand), ACE New Zealand in consultation with the Building Officials Institute of New Zealand. The original suit of producer statements has been revised at the date of this form as a result of enactment of the Building Act (2004) by these organisations to ensure standard use within the industry.

The producer statement system is intended to provide Building Consent Authorities (BCAs) with reasonable grounds for the issue of a Building Consent or a Code Compliance Certificate, without having to duplicate design or construction checking undertaken by others.

PS1 Design Intended for use by a suitably qualified independent design professional in circumstances where the BCA accepts a producer statement for establishing reasonable grounds to issue a Building Consent;

PS2 Design Review Intended for use by a suitably qualified independent design professional where the BCA accepts an independent design professional's review as the basis for establishing reasonable grounds to issue a Building Consent;

PS3 Construction Forms commonly used as a certificate of completion of building work are Schedule 6 of NZS 3910:2013 or Schedules E1/E2 of NZIA's SCC 2011[2]

PS4 Construction Review Intended for use by a suitably qualified independent design professional who undertakes construction monitoring of the building works where the BCA requests a producer statement prior to issuing a Code Compliance Certificate.

This must be accompanied by a statement of completion of building work (Schedule 6).

The following guidelines are provided by ACE New Zealand and Engineering New Zealand to interpret the Producer Statement.

Competence of Design Professional

This statement is made by a Design Firm that has undertaken a contract of services for the services named, and is signed by a person authorised by that firm to verify the processes within the firm and competence of its designers.

A competent design professional will have a professional qualification and proven current competence through registration on a national competence based register, either as a Chartered Professional Engineer (CPEng) or a Registered Architect.

Membership of a professional body, such as Engineering New Zealand (formerly IPENZ), provides additional assurance of the designer's standing within the profession. If the design firm is a member of the ACE New Zealand, this provides additional assurance about the standing of the firm.

Persons or firms meeting these criteria satisfy the term "suitably qualified independent design professional".

***Professional Indemnity Insurance**

As part of membership requirements, ACE New Zealand requires all member firms to hold Professional Indemnity Insurance to a minimum level.

The PI Insurance minimum stated on the front of this form reflects standard, small projects. If the parties deem this inappropriate for large projects the minimum may be up to $500,000.

Professional Services during Construction Phase

There are several levels of service which a Design Firm may provide during the construction phase of a project (CM1-CM5 for Engineers[3]). The Building Consent Authority is encouraged to require that the service to be provided by the Design Firm is appropriate for the project concerned.

Requirement to provide Producer Statement PS4

Building Consent Authorities should ensure that the applicant is aware of any requirement for producer statements for the construction phase of building work at the time the building consent is issued as no design professional should be expected to provide a producer statement unless such a requirement forms part of the Design firm's engagement.

Attached Particulars

Attached particulars referred to in this producer statement refer to supplementary information appended to the producer statement.

Refer Also:

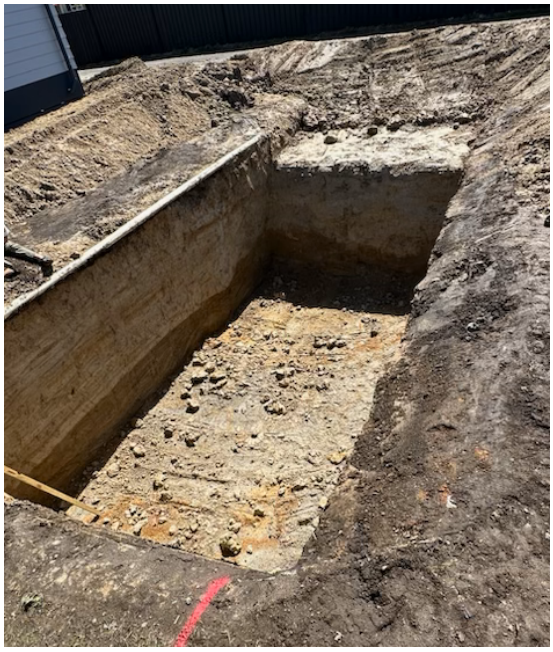
1 Conditions of Contract for Building & Civil Engineering Construction NZS 3910: 2013

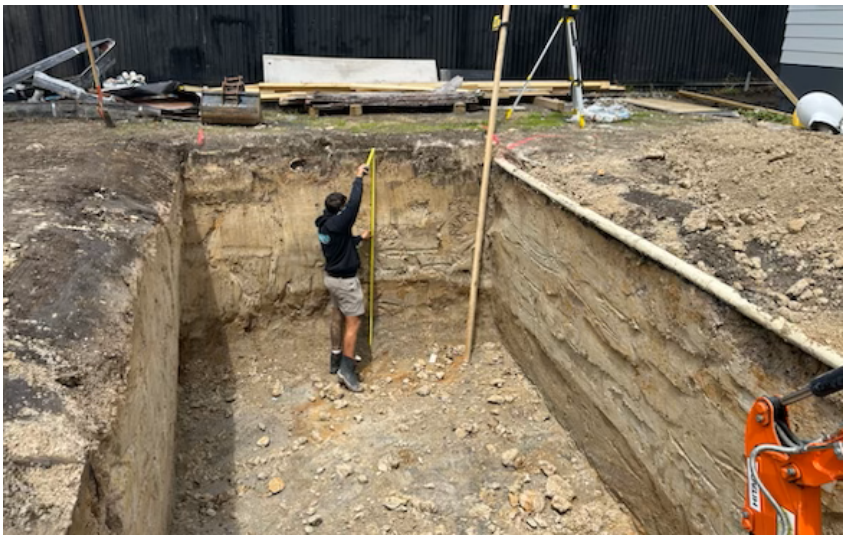
2 NZIA Standard Conditions of Contract SCC 2011

3 Guideline on the Briefing & Engagement for Consulting Engineering Services (ACE New Zealand/IPENZ 2004)

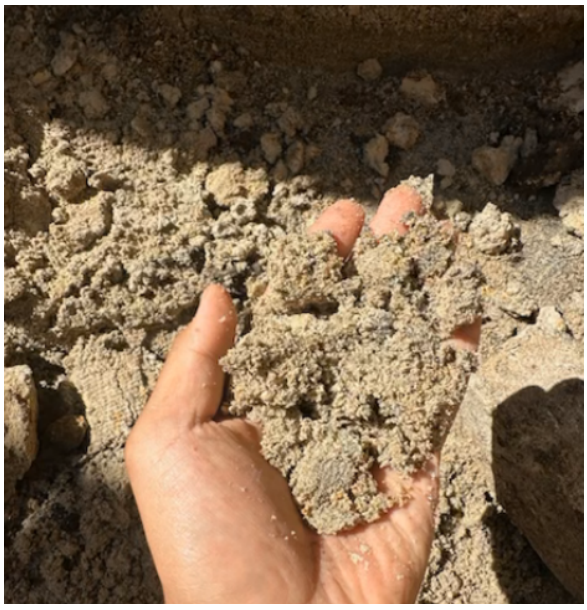
4 PN Guidelines on Producer Statements

www.acenz.org.nz
www.engineeringnz.org

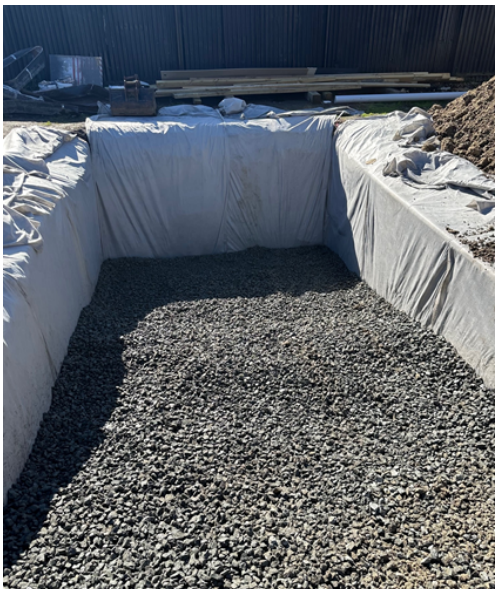




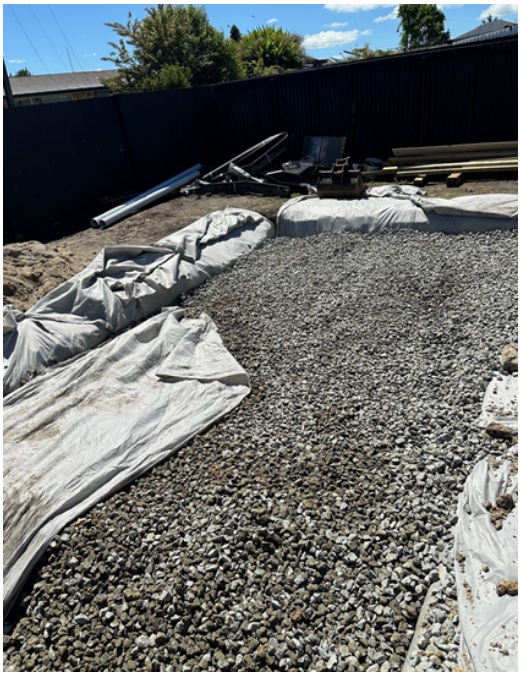
5.5m long x 3.0m wide x 2.0m deep

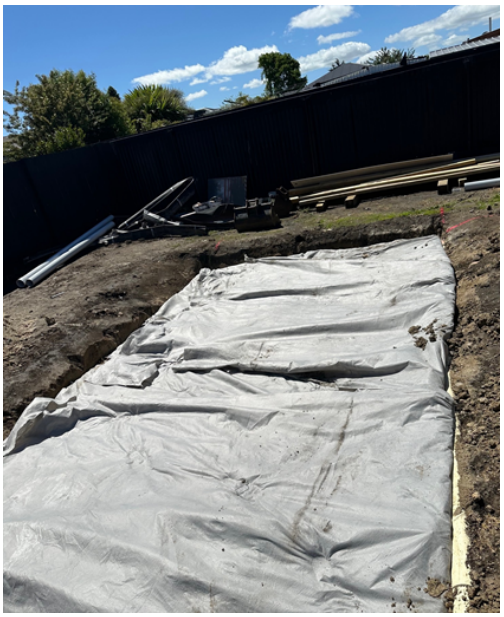


sand in base



Geofabric - 40/20 drainage aggregate





Geofabric - over the top

22/11/24