



Site Classification

AS2870-2011 Residential Slabs and Footings



Date: 08/1/2019
Date of Fieldwork: 19/12/2018
Site Number: 119605
Site Address: Lot. 322, No. 40, Samphire Drive, Connewarre, Vic, 3227
Client: Desbo Industries Pty Ltd

Summary of Assessment Results

Site Classification:	"M" in accordance with AS2870-2011
Climatic Zone:	"2" in accordance with AS2870-2011
Wind Rating:	"N2" in accordance with AS4055-2012

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Direct Contact

Any questions or queries regarding this report should be directed to Intrax Consulting Engineers on - 03 8371 0100 or email at info@intrax.com.au.

Document Template

Template V6 released 07/11/2018.

Document Revision History

Date	Version	Engineer	Comments
08/1/2019	A	Ushan Perera	First Edition

1 Introduction

Intrax Consulting Engineers Pty Ltd (Intrax) have been engaged by the client to conduct an investigation of the surface and subsurface conditions at **Lot. 322, No. 40, Samphire Drive, Connewarre, Vic, 3227** as depicted on the cover page with a view to reporting on the Site Classification for a proposed residential dwelling.

2 Site Classification

2.1 Site Geology

The available Geological Survey Maps showed the site to be underlain by **Quaternary Aged Sedimentary Deposits**. The subsurface profile encountered in the boreholes is considered to be consistent with the geological map indications.

2.2 Field Investigation

Three(3) boreholes were advanced using a **Mechanical Auger** to the depths indicated on the borehole logs (refer to Appendix B). These boreholes were positioned as indicated on the site plan (refer to Appendix A) along with details of the existing surface conditions such as slope, trees, and existing buildings. Disturbed materials obtained from augering boreholes were logged in accordance with AS1726-2016 and then classified in accordance with AS2870-2011.

A guide to the existing/natural soil profile consisted of:

FILL- SAND overlying the naturally occurring:

SAND and
Clayey SAND and
Sandy CLAY and
Gravelly SAND

Full details of the observed subsurface material and conditions have been recorded on the borehole logs and presented in Appendix B.

2.3 Site Classification In Accordance With AS2870-2011

In accordance with AS2870-2011 "Residential Slabs and Footings - Construction" a site classification of "**Class M**" is applicable to this site.

On the basis of the findings in this investigation, including visual-tactile identification of the soil profile combined with this writer's local knowledge and experience, the characteristic surface movement (Y_s) on this site, under normal condition, has been estimated to be in the range of **20mm to 40mm**.

Should a more detailed investigation (by others) with relevance to the reactivity of the soils in the local area be available, Intrax should be provided with this documentation. It is a condition of this report that any information the client may have with regards to the site and its history be provided

to Intrax. This may lead to Intrax reviewing the above classification, and conducting a more detailed geotechnical investigation with regards to the additional information. This report is not a detailed geotechnical investigation. It complies with the requirements of AS2870-2011 and is limited to the items required under Clause 2.2.2(a). Should a more rigorous assessment be required, Intrax can provide a Geotechnical Investigation of the site upon request.

2.3.1 Additional Notes Relating To This Site Classification

This investigation is based on a limited geotechnical assessment. Should the subsurface conditions encountered during construction vary from those described above, Intrax must be advised of these variations to provide comment or inspect the site where necessary. The use of standard footings as presented in AS2870-2011 is only applicable to building with a loading and a construction style similar that of a residential dwelling as described in section 3.1 of AS2870-2011.

In accordance with Clause 2.5.2 of AS2870 where the site cut exceeds 500mm a second site investigation is recommended. As such;

- **Where the cut depth is >500mm and < 1000mm the relevant design engineer may choose to design for a reduced crack zone from first principles**
- **Where the cut depth is in excess of 1000mm a second soil must be carried out to confirm the effects of the cut on the site classification"**

2.4 Wind Rating

At the time of our site visit an investigation of this site and the surrounding terrain was conducted to determine the Wind Classification Design Speed. The maximum design gust wind speed for this site is **40 m/s** based on wind speed calculations (V_h) for use in ultimate limit state design only calculated in accordance with the limitations as in AS4055 Section 1.2.

The Wind Rating for this site has been assessed as **N2**.

3 Founding Recommendations

Based on the field investigation and the site classification determined in accordance with AS2870-2011 Section 2, standard foundations systems as given in AS2870-2011 Section 3 can be adopted in this instance. The designer should refer to the recommendation below to finalise the foundation design.

The following recommendations assume that aspects of site drainage, paving, and landscaping are taken into consideration and implemented in accordance with CSIRO Building Technology File (BTF) 18 "Foundation Maintenance and Footing Performance: A Homeowner's Guide".

If you are not familiar with the above CSIRO guide please refer to www.publish.csiro.au. Should you have any difficulties with this, please do not hesitate to contact Intrax for a copy.

3.1 Minimum Founding Depths (Load Bearing Foundations)

Based on the field investigation, footing depths as described in AS2870-2011 Section 3.0 can be adopted for this site. Alternatively, a footing system can be adopted from first principles by a suitable qualified engineer for this site.

3.1.1 Allowable Bearing Pressures

The following allowable bearing pressures can be adopted for the soils listed in the table below. These bearing pressures apply where typically the embedment is a minimum of 100mm into the specified material.

Table 1: Allowable Bearing Pressures

Soil Type	Indicative Founding Depth (mm)	Maximum Allowable Bearing Capacity (kPa)
Uncontrolled Fill ¹	N/A	N/A
Natural Sands ²	400mm into layer	100
Natural Clay ²	100mm into layer	120
Natural Sands ²	100mm into layer	100

¹ **Uncontrolled Fill** - Any FILLING that does not meet the requirements of AS2870-2011 Clause 2.5.3(b). This clause allows up to 0.8m of uncontrolled SAND FILL and up to 0.4m of uncontrolled CLAY FILL without impacting on the above site classification following that all foundations are founded on the natural soils through the filling.

² **Natural Material** – All natural material given allowable bearing capacities denotes strength at optimum moisture conditions. The potential presence of perched groundwater in soils may lead to construction difficulties during wet weather. Please refer to Section 4.2 for site specific difficulties.

4 Construction Techniques and Difficulties

4.1 General

1. All loose surface fill, all roots and all organic material are to be removed from the building platform.
2. Notwithstanding the recommendations made in this report, wherever footings are close to any excavations or easements, that part of the footing must be deepened so that the projection from the underside of the footing to the bottom of the excavations makes an angle not exceeding 30 degrees in sandy soils and 45 degrees in clayey soils (This angle is measured from the horizontal). Steeper angles are not recommended unless sufficient testing and investigation has been carried out to indicate otherwise or the foundations are founded in competent rock.
3. It is recommended a second soil test be undertaken if the site is cut more than 400mm for CLAY sites. Where it is proposed to FILL the site a second soil test will be required should > 400mm of CLAY FILL be proposed or >800mm SAND FILL be proposed. It is recommended that any FILLING placed meet the requirements of CONTROLLED FILL as this will minimise the impact of the FILLING on the current classification of the site.
4. The Plumber shall lay waste pipes below ground surface at minimum grade. Risers are to be staked firmly.
5. Care shall be taken with surface drainage of the allotment from the start of construction and must be well drained so that water cannot pond beside or adjacent to footings. The drainage system shall be completed by the finish of construction of the house in accordance with AS2870-2011 Clause 5.5.3 (a).
6. Proper site drainage is very important in reactive sites such as this site. It is therefore recommended that the ground surface immediately next to the perimeter footings be graded away or site drainage issues be addressed. Should you the client require detailed design for specific site drainage plans please do not hesitate to contact Intrax Consulting Engineers.
7. Any filling placed across the site to assist in levelling prior to slab construction should conform with the requirement for either Controlled fill (Clause 2.5.3) or Rolled fill (Clause 6.4.2) AS 2870-2011. These clauses are as follows. If it cannot be confirmed that the fill is Controlled Fill or Rolled Fill then the reader should refer to item (c).
 - A. Controlled Fill - Fill that will be required to support structures or associated pavements, or for which engineering properties are to be controlled AS2870-2011. Refer Clause 2.5.3, Clause 2.5.3(a)(c) - (ie: where a specification has been provided on the type, quality and compaction requirements for filling at a site and the earthworks have been deemed compliant with the specification)
 - B. Intrax has the express right to deem FILL uncontrolled where it cannot be clearly demonstrated that fill has been placed under the above conditions. That is to say that it is a

requirement of the developer/builder to demonstrate fill placement has been placed in the appropriate layer thicknesses.

C. Rolled Fill - Rolled Fill consists of material compacted in layers by repeated rolling with an excavator or similar equipment. The depth of rolled fill shall not exceed 0.6metres compacted in layers not more than 0.3m thick for sand material or 0.3m compacted in layers not more than 0.15m thick for other material AS2870-2011 Cl6.4.2(b)

D. Where the nature of the fill cannot be confirmed, this office must undertake an assessment of the fill or be supplied with a suitable compaction report or geotechnical assessment of the fill to undertake an appropriate design for the site if the fill is to be utilised as a foundation.

8. We advise that it is possible that some sites may still have the presence of isolated areas of original organic material that may not have been fully removed during the sub division earthworks development stage. Intrax will make every effort to identify organic material within the soil profile, however due to the limitation on the number of boreholes for each site investigation, it is possible that some of these pockets may escape identification. Intrax does not take responsibility for isolated organic material that lies in areas outside our borehole locations, to the extent that these pockets could affect the design or construction of the footing system.

4.2 Site Specific

- **The soils encountered on-site could develop a localised perched groundwater during periods of high rainfall which may lead to construction difficulties associated with excavations on this site.**

5 Conditions Of Use Of This Report

5.1 Report Limitations

1. The recommendations in this report are based on the following:
 - a) Information about the site & its history, proposed site treatment and building type conveyed to us by the client and or their agent
 - b) Professional judgments and opinions using the most recent information in soil testing practice that is available to us.
 - c) The location of our test sites and the information gained from this and other investigations.
2. Should the client or their agent neglect to supply us with correct or relevant information, including information about previous buildings, trees or past activities on the site, or should changes be made to the building type, size and or/position, this report may be made obsolete, irrelevant or unsuitable. In such cases, Intrax will not accept any liability for the consequences and Intrax reserves the right to make an additional charge if more testing or a change to the report is necessary.
3. The recommendations made in this report may need to be reviewed should any site works disturb any soil 200mm below the proposed founding depth.
4. The descriptions of the soils encountered in the boreholes follow those outlined in AS1726-2017; Geotechnical Site Investigations. Colour descriptions can vary with soil moisture content and individual interpretation.
5. If the site conditions at the time of construction differ from those described in this report then Intrax must be contacted so a site inspection can be carried out prior to any footing being poured. The owner/builder will be responsible for any fees associated with this additional work.
6. This report assumes that the soil profiles observed in the boreholes are representative of the entire site. If the soil profile and site conditions appear to differ substantially from those reported herein, then Intrax should be contacted immediately and this report may need to be reviewed and amended where appropriate. The owner/builder will be responsible for any fees associated with this additional work.
7. The user of this report must take into account the following limitations. Soil and drilling depths are given to a tolerance of +/- 200mm. Where spot levels or a feature survey have been undertaken, levels are given a tolerance of +/- 200mm.
8. It must be understood and a condition of acceptance of this report is that whilst every effort is made to identify fill material across the site, difficulties exist in determining fill material, in particular, for example, well compacted site or area derived fill, when utilising a small diameter auger. Consequently Intrax emphasises that we will not be responsible for any financial losses, consequential or otherwise, that may occur as a result of not accurately determining the fill profile across the site.
9. Intrax's assessment of flooding is based on Government/Council planning and GIS data available at the time of this investigation. Intrax has not made a site specific assessment based on height or hydrological data with reference to the future flood risk at the property. Intrax does not guarantee that this site is free from flooding as further detailed investigation may be required.
 - a) This report does not assess the potential for landslide, undermining or aggressive soils.

5.2 Variations To This Report

It is neither economically feasible nor practical to determine every subsurface feature on the site. Studies have shown that a large number of boreholes leads to only a slight increase in probability of detecting hidden site features (such as a filled well or cellar) in the foundation soils. As such, any variations, or discrepancies in soil type, colour, or horizon depth must be reported to the Engineer immediately so that their potential influence on the footings may be assessed.

5.3 Loss Or Damages

Subject to the limitations of this report as expressed in [Section 5.1](#), Intrax Consulting Engineers Pty Ltd will not accept liability for loss or damage, consequential or otherwise, based on the recommendations of this report, other than for the cost of re-assessment. This site classification assessment should not be considered a comprehensive analysis of the subject site. Should a more detailed geotechnical assessment be required Intrax Consulting Engineers Pty Ltd can provide such a report. Please contact Intrax Consulting Engineers Pty Ltd to discuss this further.

Should you have any questions regarding this report please do not hesitate to contact the Intrax Site Classification Division on 03 8371 0100.

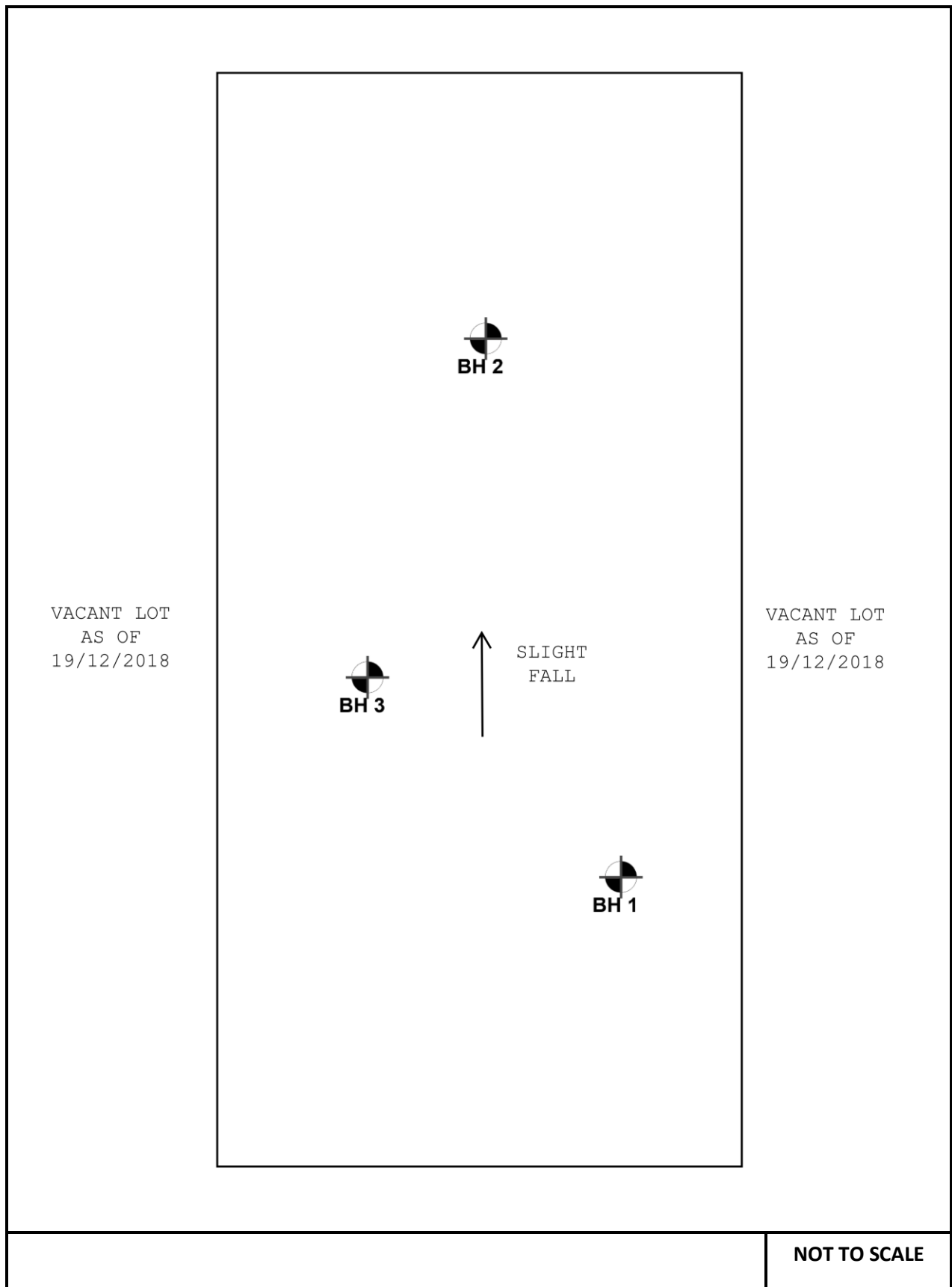
For and on behalf of Intrax Consulting Engineers Pty Ltd

A handwritten signature in black ink, appearing to read 'Ushan Perera', with a stylized flourish at the end.

Ushan Perera
B.Eng (Civil & Infrastructure)

Appendix A


Site Plan

Site Plan

Appendix B

Borehole Logs

Borehole Logs

Site Address: Lot. 322, No. 40, Samphire Drive, Connewarre, Vic, 3227							MECHANICAL AUGER	MECHANICAL AUGER	MECHANICAL AUGER
Horizon	USC	Soil Type	Moisture	Density/ Consistency/ Strength	Plasticity	Description	Borehole 1	Borehole 2	Borehole 3
EXISTING SURFACE LEVEL							0	0	0
UNCONTROLLED FILL	SM	gravelly SAND	Dry	Loose	N/A	dark grey brown, root material.	0 - 100	0 - 100	0 - 100
A	SM	SAND	Dry	Dense	N/A	pale grey brown orange.	100 - 800	100 - 800	100 - 1200
B	SC	clayey SAND	Moist	Dense	N/A	mottled white grey brown.	800 - 1400	---	---
C	CI	sandy CLAY	Moist, Dry of Plastic Limit	Stiff	Medium Plasticity	brown to mottled white brown orange.	---	800 - 1800	1200 - 1800
C	SM	gravelly SAND	Moist	Medium Dense	N/A	pale white grey, tending to weathered rock.	1400 - 1800	---	---
				Intrax ID #: 119605			NO REFUSAL	NO REFUSAL	NO REFUSAL
				Date of Fieldwork 19/12/2018			Groundwater Not Encountered	Groundwater Not Encountered	Groundwater Not Encountered