DIRECTORS
Stewart McGeady Rick Wray Brad Seghers

# FLOOD RISK MANAGEMENT REPORT

Northern Beaches Council (Manly)

Proposed Alterations and Additions

at

58 Alexander Street, Manly

Job No. 190684

Issue A

Prepared for: Claire Ravesteijn

Prepared by: Cameron Haack

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## Contents

# FLOOD RISK MANAGEMENT REPORT

| | |
|---|---|
| DATE | 5th July 2019 |
| SITE | 58 Alexander Street, Manly |
| ENGINEER | Cameron Haack |
| CLIENT | Claire Ravesteijn |
| JOB No | 190684 – Issue A |

## INTRODUCTION:

NB Consulting Engineers assessed the plans prepared by *Network Design P/L – dated November 2018* for the proposed alterations and additions at the above site address in reference to potential flooding issues. The proposed development generally meets the requirements of Northern Beaches Council (Manly DCP) subject to the recommendations outlined in this flood risk management report.

The premises has been assessed in accordance with the requirements of Manly Councils *Specification for Stormwater Drainage 2003* and *Interim Policy – Flood Prone Land 2013*, Council's Flood Advice information provided, the Manly Lagoon Flood Study (2013) and the NSW Government Floodplain Management Manual (Jan 2001).

The site is located on Alexander Street in Manly but does not back onto Manly lagoon. This report is in reference to a Development Application for a proposed new carport and first floor additions. The development site is located within the vicinity of the flow extents (for the 1% AEP flood event) of the flood as predicted in the *Manly Lagoon Flood Study (2013).*

It should be noted that the *Manly Lagoon Flood Study (2013)* predicts the 1% AEP flood extends to a level of RL 3.15m AHD and will inundate the property.

Below is a summary of flood information in reference to Northern Beaches Council (Manly) Flood Assessment report requirements and the *NSW Government Floodplain Management Manual* with reference to the 1% AEP storm event.

## FLOOD RISK REPORT:

- Flood Risk Planning Precinct — Medium
- 1% AEP Flood Level — 3.15m AHD
- Extreme Flood Level (PMF) — 5.65m AHD
- Flood Planning Level (FPL) — 3.65m AHD
- Existing Dwelling Floor Level — 3.02m AHD (lower GF)
  3.20m AHD (upper GF)
- Proposed First Floor Level — 6.78m AHD
- Degree of inundation — 100%
- Impacts of waterborne objects — Medium
- Buoyancy — Medium
- Hydraulic Category — Flood Storage
- Onsite Response Strategy — Shelter In Place
- Flood Behavior

  The development lies in the floodplain of the coastal Manly Creek and Lagoon which discharges to the ocean at the Queenscliff beach. The Lagoon has possible flooding impacts from four sources, as follows;

  a. Flooding from upstream runoff. This is the major cause of flooding.
  b. Storm surges as a result of low atmospheric pressure, combined with strong onshore winds.
  c. Lagoon and creek entrance blockage by sand deposits or open to the sea.

d. Tidal effects or combination of all four impacts.

The lagoon and creek act similar to a detention basin where water is temporarily stored prior to discharge to the Tasman Sea. The lagoon slowly releases water to the sea during the latter part of the flood. The flood level at the site would closely correspond with the extreme flood levels.

- Flood storage No anticipated net reduction,
  The proposed building footprint area contributing to potential flood blockages will remain the same as a result of the development. We note that the proposed eastern and western sides of the carport structure are completely open, thus providing the 50% openings to this area. The FFL is recommended to be reduced to the existing natural surface levels (approximately RL 2.65m – 2.70m).

- Recommendations for structural design
  The proposed structures are recommended to be designed and inspected by a structural engineer to ensure the structure is adequate to withstand the forces of floodwaters up to the PMF with low velocity. Any other new structures located below the PMF are to be designed to cater for the flood loads.

- Types of materials to be used
  Any new structures are to be constructed of standard building materials of concrete, steel, timber and/or brickwork within the flood levels. Any proposed fencing along the boundaries, are to be certified and/or designed by a civil engineer to withstand hydrostatic forces up to and including the FPL (unless noted otherwise). Openings are to be provided, excluding the property frontage, to ensure the 1% AEP floodwater is able to flow through the property unimpeded.

- Driveway and car parking
  A driveway and garage are proposed fronting the Northern boundary of the property (Rolfe street frontage). The garage is proposed to replace an

existing pergola which currently has a solid timber wall/fence along the boundary at least 1.5m high. The garage is recommended to be proposed as a carport with FFL matching the natural surface levels (approximately RL2.65m – 2.70m) to comply with council's flood management requirements. The side boundary walls of the garage/carport structure are proposed to be fully open up to at least the FPL, ensuring the overall structure is 50% open to allow the passage of floodwater across the site. The garage door is proposed to replace the existing solid timber wall/fence along the rear boundary. To mitigate the flooding issues within the designated parking/driveway area, we recommend:

- Bollards or a garage door and associated wall structure is recommended to ensure cars parked will not be swept away in extreme flood events. Any new carport structures are to be designed to withstand hydraulic flood forces up to the FPL and buoyant forces for impact of a car.

  The open car parking levels will experience approximately 950 - 1000mm depth of floodwaters in the 1% AEP flood event. The property owner is to acknowledge the existing parking levels are below the flood level and an inundation of vehicles may occur in the event of the 1% AEP rainfall event.

This option is subject to council's discretion. Any new driveway and parking grades are to comply with AS2890.1 and Northern Beaches (Manly) council requirements.

- Ground floor requirements

  NB Consulting has assessed the extent of the proposed development and note there are no additions proposed at the ground floor level. We are of the opinion that it would be impractical to raise the existing ground floor level to the FPL of 3.65m AHD.

We further note that a previous DA submission, approved in 2010 required the previously completed ground floor additions to be raised to RL3.20m AHD (above the 1% AEP flood level).

The proposed alterations are not envisaged to have an effect on the flood levels and there is no proposed decrease in flood storage. The property owner however, is to acknowledge the existing floor levels are below the FPL and a level of inundation may occur in the event of the 1% AEP rainfall event.

- Onsite Stormwater Management

  Site Stormwater management and discharge is recommended to be designed by a civil / hydraulic engineer with relevant experience. The site Stormwater disposal method is recommended to be in general accordance with *AS3500.3* and Northern Beaches Council (Manly) DCP requirements. Additional council approval / review of alternative disposal methods may be required. As the site is within a flood storage area at the downstream end of a catchment, we recommend Onsite Detention be waived for this development as it is likely to exacerbate flooding due to coinciding of peak flows from the site with relation to the overall catchment.

- Waterproofing methods

  All electrical equipment is to be fitted with circuit breakers. Switchboard and main circuit unit to be fitted above the FPL flood level of 3.65m AHD. Other valuable materials or possessions are to be stored as above and should be acknowledged by the owner and occupant that a reasonable extent of damage to fittings below the FPL (RL 3.65m AHD) is to be expected during the 1% AEP storm event.

- Flood warning Signage is recommended
- Evacuation strategy and onsite response plan Shelter in place

Should floodwaters begin to inundate the street adjacent the property residents are recommended to remain indoors and proceed to the proposed first floor (RL 6.78m), located above the PMF of 5.65m AHD.

A copy of this report is to be kept on the premises at all times. This should be executed, on individual assessment, during high intensity rainfalls within the first 5–10 minutes of a storm and monitored accordingly. Refer to the local Northern Beaches flood warning website for updates: http://new.mhl.nsw.gov.au/users/NBFloodWarning/

- Hazardous Material Storage
  Hazardous chemicals are not to be stored in areas under the Flood Planning Level of 3.65m AHD and should be acknowledged by the owner and occupant.

## RECOMMENDATIONS / CONCLUSION:

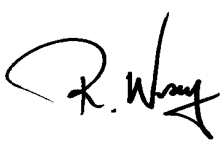
- The proposed development is not envisaged to have an adverse effect on surrounding properties. The flood levels provided from council flood information have been adopted for this assessment. The proposed development generally meets the requirements of *Northern Beach Council (Manly) DCP* provided the recommendations within this report are implemented. A development application is recommended.

- Authors qualifications / experience

Rick Wray
Director NB Consulting Engineers
BE(Civil) MIEAust CPEng NER RPEQ
Over 30 years professional experience

We trust that this certificate meets with your requirements. Please contact the author if further clarification is required.

**NORTHERN BEACHES CONSULTING ENGINEERS P/L**



**Rick Wray**
Director
BE(Civil) MIEAust CPEng NER RPEQ

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# APPENDIX A – FLOOD INFORMATION (MANLY COUNCIL)

northern beaches council

## Natural Environment Referral Response - Flood

| | |
|---|---|
| **Application Number:** | DA2019/0547 |

| | |
|---|---|
| **To:** | Rhiannon McLardy |
| **Land to be developed (Address):** | Lot A DP 106210 , 58 Alexander Street MANLY NSW 2095 |

**Reasons for referral**

This application seeks consent for the following:

- All Development Applications on land below the 1 in100 year flood level;
- All Development Applications located on land below the Probable Maximum Flood levels.

And as such, Council's Natural Environment Unit officers are required to consider the likely impacts on drainage regimes.

**Officer comments**

The site is within the medium flood risk precinct. As per the Manly DCP, the floor level of the enclosed garage is required to be at a level equal to, or higher than the 1% AEP flood of 3.15m AHD. New fences are required to be at least 50% open between the ground and 1% AEP flood level. The development must not result in a net loss of flood storage, or result in any adverse flood affects on neighbouring properties. A Flood Management Report is required to be submitted, showing that the development complies with the above, as well as other the flood prone land controls.

**Referral Body Recommendation**

Recommended for refusal

**Recommended Natural Environment Conditions:**

Nil.



Figure 1.0 – Northern Beaches Council *'RFI Response.'*

# APPENDIX B – PROPOSED DRAWINGS AND SITE SURVEY

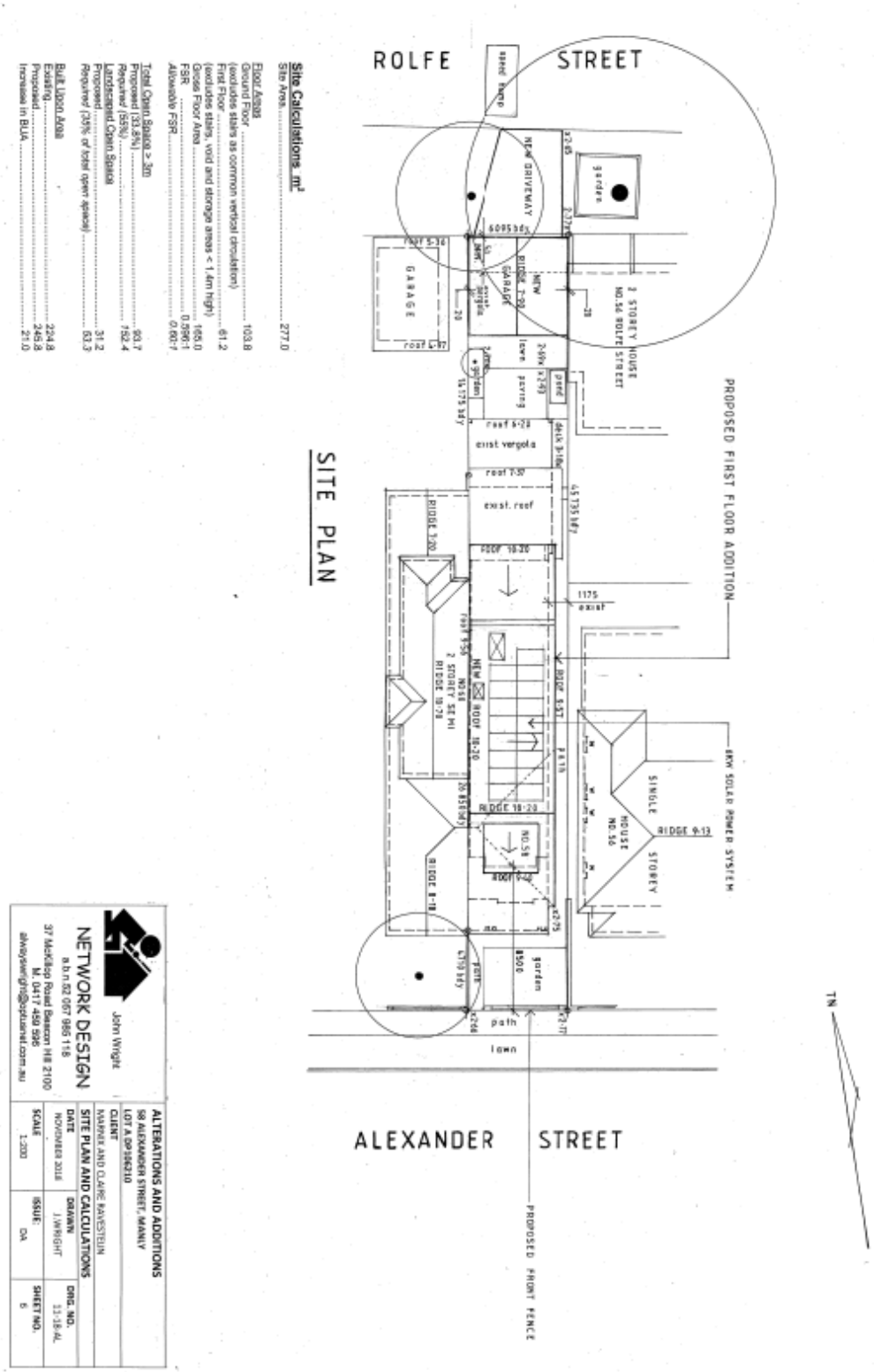


Figure 2 – Site Plan by *'Network Design'*.

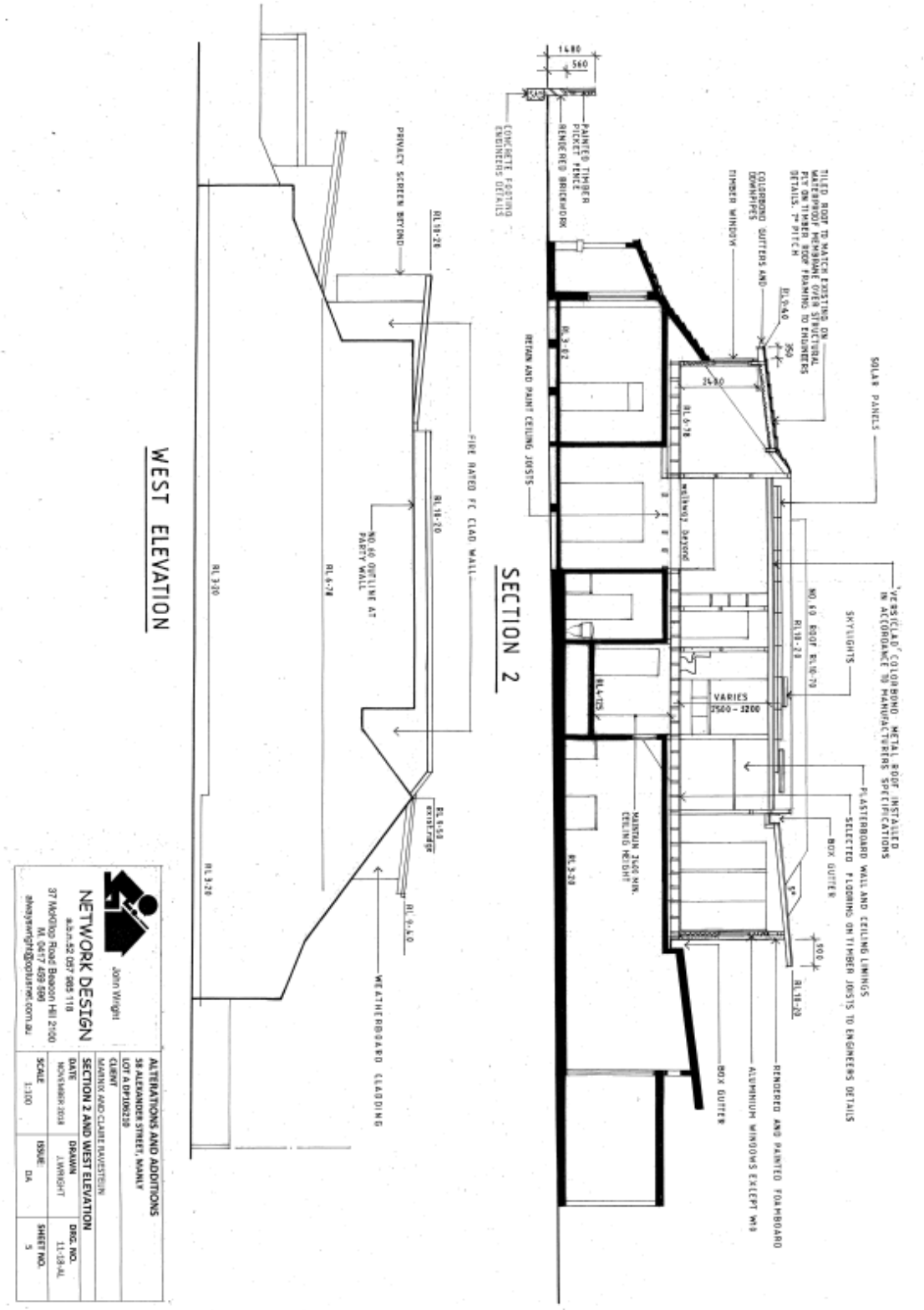


Figure 3 – Elevations by *'Network Design'.*

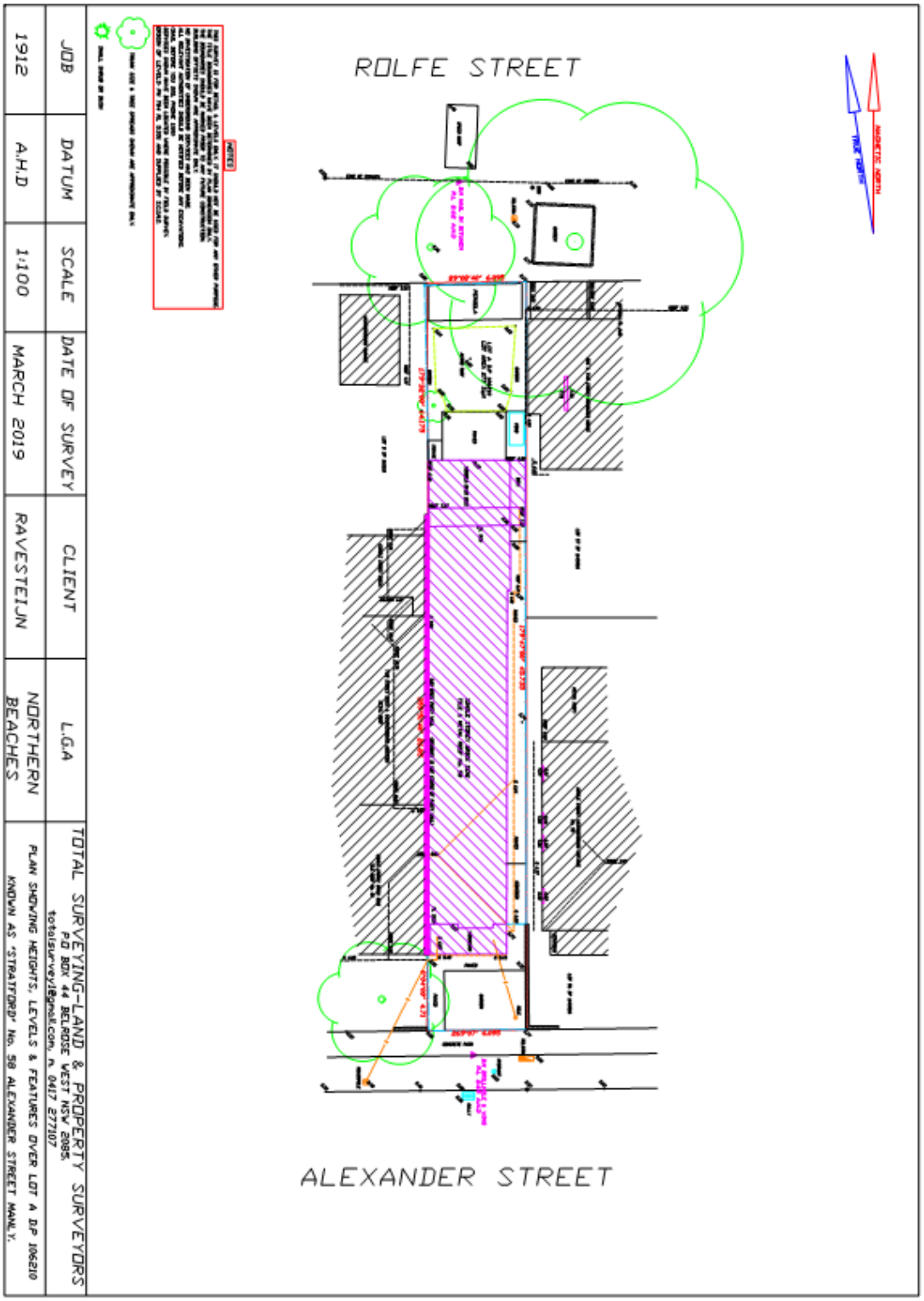


Figure 8 – Site Survey by *'Total Survey-Land & Property Surveyors'*.