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Date: 6th of APRIL 2020

Ref: ACE191535.DS2

DESIGN STATEMENT

PROJECT:	Proposed Earthworks
LOCATION:	251 Adelaide St, Raymond Terrace
ELEMENTS:	Proposed Retaining Walls

This statement is provided for the proposed Retaining Wall works at 251 Adelaide St, Raymond Terrace.

I confirm that the preliminary design documents prepared by our office which details the proposed stepped gabion retaining wall intends to comply with:

- 1. Port Stephens Council Subdivision With Public Infrastructure Standards and Guidelines
- 2. Port Stephens Council Earthworks Specifications
- 3. Relevant Australian Standards AS 4678-2002 for Earth Retaining Structures and AS 3798-2007 Guidelines on Earthworks For Commercial and Residential Developments
- 4. Council's Civil Works Specifications and Standard Drawings
- 5. Flood Assessment Report dated 28th March, 2017, prepared by BMT
- 6. Flood Assessment Report dated 19th September, 2018, prepared by BMT in response to the additional information sought by the NSW Office of Environment and Heritage (OEH)
- 7. Earthworks Flood Impact Assessment dated 5th May, 2019, prepared by BMT
- 8. Preliminary Geotechnical Investigation Report prepared by Aargus and Survey Drawing
- 9. Accepted Engineering Practices and Principles

The proposed two stepped gabion retaining wall with a maximum height of 3 meters as shown on the plans prepared by our office Rev B, dated: 01.04.2020 will comply with the above standards and anticipate no adverse impact on the surroundings and neighbouring property. The plans prepared by our office also demonstrates the retaining wall to be constructed on the compacted fill of up to 2 meters with compliant suitable fill material as required by the relevant Australian Standards mentioned above.

No other standards or practices have been relied upon for this statement.

This statement shall not be construed as relieving any other party of their responsibilities, liabilities or contractual obligations.

Yours faithfully, Australian**Consulting**Engineers Pty Ltd PER:

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Dr. Anthony S. Hasham B.E., M.E., M.B.A., Ph.D., F.I.E. Aust., CPEng., N.P.E.R., R.P.E.Q. Civil/Structural Engineer/Director

APRIL 2020



Conceptual Earthworks Report Concerning 251 Adelaide Street, Raymond Terrace, NSW

Prepared For Pheonix Builders

ACE Project No. ACE191535

Issue C April 2020

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Project No: ACE191535						
Report Type: Conceptual Earthworks Report						
Site Address: 251 Adelaide Street, Raymond Terrace						
Filename: ACE191535 - Conceptural Earthworks Report REV C						
Revision B		Position	Date	Comments		
Prepared By	Samip Shah	Civil Engineer	06 April 2020	Nil		
Reviewed By	Joe Bacha	Civil Engineer	04 April 2020	Nil		
		/Director	06 April 2020			

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Client	Comments
Pheonix Builders	Nil

Disclaimer

The advice and information contained within this report relies on the quality of the records and other data provided by the Client and obtained from visual site inspections along with the time and budgetary constraints imposed.

APRIL 2020

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1 INTRODUCTION

Australian Consulting Engineers have been commissioned to undertake Preliminary Earthworks and Retaining Walls Civil Works Plan. This report will identify and detail the Earthworks and Retaining Walls requirements and is prepared to supplement the plans prepared by our office.

This report will:

- 1. Describe the existing site conditions within the subject site and surroundings;
- 2. Identify and detail the required earthworks proposed for the subject site;

No testing of any sorts has been carried out for the preparation of this report and has been prepared based on a site inspection and generally in accordance with good engineering practise and the best of our knowledge.

2 SITE DETAILS AND REVIEW OF FLOOD ASSESSMENT REPORTS

The subject site at 251 Adelaide Street, Raymond Terrace, is located on the low-lying floodplain of Windeyers Creek, which is upstream of the Hunter River. The site is positioned south of the Raymond Terrace township and is bounded by the elevated road embankments of Adelaide Street and Pacific Highway.

Windeyers Creek is a wide and low-lying swamp and it separates into two branches. The northern creek branch known as Grahamstown Drain is a welldefined channel running along the north and west boundaries of the site.

The north western corner of the site is the primary area of development which will utilize compacted fill ranging from 1.5m AHD to 2.0m AHD to bring the proposed level of development site above the Flood Planning Level of 5.7m AHD.

Figure 1 below shows the subject site location outlined in red with the north western portion of the site shown as area of development.



Figure 1 - Location of the Subject Site – 251 Adelaide Street, Raymond Terrace, NSW

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The proposed development at the north western portion of the site is identified to have extensive earthworks to provide adequate fill towards the southern border of the development to achieve the Flood Planning Level of 5.7m AHD. To validate the need for the extensive fill within the site, our office has reviewed the Flood Assessment Report and Earthwork Flood Impact Assessment Report prepared by BMT.

As described within the Flood Assessment Report prepared by BMT, dated 28th March, 2017, the peak flood level for the flood planning event is 5.2m AHD. With an additional 0.5m freeboard for a residential development, the Flood Planning Level would be 5.7m AHD for habitable floor levels for the subject development. Since majority of subject site is elevated below 2.5m AHD, an extensive amount of fill would be required to provide adequate flood immunity. As it can be seen in **Figure 2** below, the north western portion of the site will require extensive fill and would be excluded from existing flood storage.

The Flood Assessment Report prepared by BMT, dated 19th September, 2018 which was prepared in response to the additional information sought by NSW Office of Environment and Heritage (OEH), describes the Flood Classifications for Hunter River at Raymond Terrace. According to this information in the report, the Major Flood Classification has a Gauge Height Value of 3.5m AHD. The Flood Planning Level of 5.7m AHD as described above, is well in excess of the Gauge Height Value.

The Earthworks Flood Impact Assessment prepared by BMT, dated 5th May, 2019 undertook the Flood Impact Assessment to assist the development application of the proposed earthworks at the subject site. One of the main intentions was to identify and assess potential off-site flood impacts associated with the proposed works. Based on this study, a conceptual fill plan (refer to **Figure 2**) was derived which identifies the developable area of the subject site where it can be filled as high as required to provide for flood immunity.

In addition to the review of the above three reports, our office has utilized the Concept Fill Plan as well as the Preliminary Site Plan (Option 9) to develop the extent of the retaining walls as well as the areas of developable site which requires compacted fill.

3 PROPOSED EARTHWORKS FOR THE DEVELOPMENT SITE

Earthworks and Retaining Walls Civil Works Plan prepared by our office are primarily based on the Concept Fill Plan prepared by BMT (Refer **Figure 2**) and the Preliminary Site Plan (Option 9) (Refer **Figure 3**). Based on the Fill Plan, the southern portion of the development site is intended to be raised with compacted fill of up to 2 meters.

This fill area borders the wide, low-lying area of the Grahamstown Drain. As a result of the proposed development with an average fill of 2 meters along the southern side of the development site, an earth retaining wall is proposed which runs along the southern length of the development. The height of the retaining wall ranges from 1.0m to 3.0m at the highest elevational difference.

The compacted fill in this area will follow the Port Stephens Council Earthworks specifications and Port Stephens Council Subdivision with Public Infrastructure Standards and Guidelines as well as the relevant Australian Standards AS 3798-2007 Guidelines on Earthworks for Commercial And Residential Developments.



Figure 2 – Concept Fill Plan prepared by BMT

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CONCEPTUAL EARTHWORKS REPORT CONCERNING 251 ADELAIDE STREET, RAYMOND TERRACE, NSW



Figure 3 - Preliminary Site Plan (Option 9)

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The general guidelines for earthworks and required compaction rates are as per below:

- 1) Earthworks notes are to be read in conjunction with the general and coordination notes.
- 2) Earthworks shall be carried out in accordance with Port Stephens Council Earthworks specifications and Port Stephens Council Subdivision with Public Infrastructure Standards and Guidelines.
- 3) Earthworks shall also comply with the procedures set down in A.S. 3798 'Guidelines on Earthworks for Commercial and Residential Developments'.
- 4) Bulk earthworks including clearing, filling and testing, are to be carried out in accordance with the current council standards, drawings and specifications. Council standards supersede any notes or specifications written on the design drawings.
- 5) Bulk earthworks levels shall be determined relative to the finished surface levels. Refer Architectural Drawings for slab levels, to the Structural Engineers Drawings for building and path slab thickness and to the Civil Engineers Drawings for external finished surface levels and external pavement thicknesses.
- 6) Topsoil shall be stockpiled as directed by the superintendent on site.
- 7) Prior to placement of any filling all topsoil and organic material is to be removed and the subgrade shall be uniformly compacted to the minimum dry density ratios shown in Note 10. Any soft spots revealed by compaction shall be removed as directed by the superintendent and backfilled with compacted select fill.
- 8) Moisture content of compacted fill should be maintained within 2% of optimum moisture content.
- 9) Fill shall be compacted in maximum 200mm thick layers (loose thickness) to the following minimum dry density ratios (Standard Compaction A.S. 1289.5-1).
 - a. Upper 0.3m of Pavement Subgrade = 100%;
 - b. Under Buildings = 98%;
 - c. General Fill = 95%.
- 10) All fill material placed on the site shall comprise only natural earth and rock, and is to be free of contaminants (as defined by Section 11 of the Environmental Protection Act 1994), noxious, hazardous, deleterious and organic materials. No demolition material is to be used. Suitable fill material is deemed to comply with the requirements of Clause 4.3 of A.S. 3798, 'Guidelines on Earthworks for Commercial and Residential Developments'.
- 11) Imported fill shall comply with the following:
 - a. Soaked CBR = minimum of 15%;
 - b. Liquid Limit = 30% max;
 - c. Plasticity Index = 15% max;
 - d. Maximum Aggregate Size = 75mm;
 - e. Passing 0.075mm Sieve = 30% max;

f. Shrink/Swell Index = 1.0% max.

12) The contractor is to engage, at their expense, an approved NATA registered laboratory to carry out site control to 'level 1' standard as set out in Appendix B of A.S. 3798-2007 'Guidelines on Earthworks for Commercial and Residential Developments' and provide a 'level 1' report on completion of earthworks.

This report has been prepared generally in accordance with good engineering practise and the best of our knowledge.

4 **REFERENCES**

- 1. Port Stephens Council Subdivision with Public Infrastructure Standards and Guidelines
- 2. Port Stephens Council Earthworks Specifications
- 3. Australian Standards AS 4678-2002 for Earth Retaining Structures and
- 4. Australian Standards AS 3798-2007 Guidelines on Earthworks For Commercial and Residential Developments
- 5. Council's Civil Works Specifications and Standard Drawings
- 6. Preliminary Geotechnical Investigation Report Prepared by Aargus Pty Ltd; Dated: 24th January, 2020
- 7. Flood Assessment Report dated 28th March, 2017, prepared by BMT
- 8. Flood Assessment Report dated 19th September, 2018, prepared by BMT in response to the additional information sought by the NSW Office of Environment and Heritage (OEH)
- 9. Earthworks Flood Impact Assessment dated 5th May, 2019, prepared by BMT