CIVIL GEOTECHNICAL SERVICES
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14 October 2014

Our Reference: 14370:PJF1940/526A

Cranbourne Road Holdings
c/- Villawood Properties
Level 1 6 Riverside Quay
SOUTHBANK VIC 3006

Dear Sirs,

RE: LOT 526A OF THE PASADENA ESTATE (STAGE 5), CLYDE

Winslow Constructors Pty Ltd has recently constructed a residential subdivision (referred to as Stage 5 of The Pasadena Estate) which is located on the west side of Clyde – Five Ways Road in Clyde. As part of the subdivisional works, Civil Geotechnical Services were engaged by Winslow Constructors to provide inspection and testing services for the bulk earthworks associated with the construction of the residential allotments. The testing and inspection services were undertaken in accordance with the Level 1 requirements of AS 3798 – Guidelines on Earthworks for Commercial and Residential Developments.

Construction of the Lot noted above (refer to the attached plan for its location) essentially involved a grade and shape operation (ie negligible fill placement).

The Cranbourne sheet of the Geological Survey Maps of Victoria shows the above allotment to be underlain by Tertiary aged deposits associated with the Baxter formation. The Baxter formation materials encountered within this stage of the subdivision comprise high plasticity clays and sandy clays that exhibit moderate to high shrink-swell surface movements when subjected to changes in seasonal soil moisture content. Sands (particularly near surface) and clayey sands are also present and the geological composition can vary quite markedly over very short distances.

The anticipated geology and the foregoing description of the underlying materials were generally confirmed by site observations and field activities undertaken during construction of the subdivision (eg foundation preparation works, inspection of trench excavations and by a broad scale drilling program).

After a consideration of the foregoing, the site has been classified as **CLASS M**. Accordingly, a conventional shallow footing system that is founded in the 'undisturbed' materials could be satisfactorily utilised at this allotment.

The most appropriate foundation system for this allotment is a conventional stiffened raft slab. Accordingly, it is recommended that a stiffened raft slab be utilised, with the slab designed and detailed in accordance with the Class M classification requirements of AS 2870. The edge and load bearing beams should be founded in the 'undisturbed' materials at a minimum depth of 0.5 metres below finished surface levels. Edge and load bearing beams founding in this manner would have an allowable bearing pressure of 100 kPa. The raft stiffening beams, provided that their contact pressures do not exceed 50 kPa, should be

founded in the ‘undisturbed’ materials at a minimum depth of 0.2 metres below finished surface levels. The slab infill panels can be founded directly onto the ‘undisturbed’ materials.

Consideration could also be given to utilising a waffle raft slab. However, if a waffle raft slab is utilised, the near surface topsoil and any loose and disturbed materials will need to be removed from the building footprint prior to construction. Previous experience suggests that this option will require the removal of up to 0.25 metres of topsoil materials and the like. However, there may be sections of the site where additional excavation depths are required. If a waffle raft slab is to be utilised, the waffle raft slab should be designed and detailed in accordance with the Class M classification requirements of AS 2870. Particular attention will also need to be directed towards ensuring that a stable moisture regime is maintained around the slab periphery. Furthermore, due to the significant problems that have been experienced with washout from the undersides of slab edges and corners, it will be necessary to found the perimeter beams into the ‘undisturbed’ materials for a distance of not less than 0.4 metres. Perimeter beams founding in this manner would have an allowable bearing pressure of 100 kPa. Internal beams may be founded in the ’undisturbed’ materials at higher levels than the perimeter beams. An allowable bearing pressure of 100 kPa is also available for these latter beams.

The site classifications and design recommendations presented above assume that the current natural drainage and infiltration conditions at the site will not be markedly affected by the proposed site development work. Care should therefore be taken to ensure that surface water is not permitted to collect adjacent to any structure and that significant changes to seasonal soil moisture equilibria do not develop as a result of service trench construction, garden bed development or tree root action.

Attention is drawn to Appendix B of AS 2870 and its referenced documents as a guide to maintenance requirements for any proposed structures. In particular, attention should be directed at the design stage towards ensuring that any structures are relatively flexible and well articulated (eg closely spaced full height articulation joints, minimal brickwork over or under widow openings etc). Guidance on articulation spacings and associated detailing are provided in Technical Note 61 - Articulated Walling which is published by The Cement and Concrete Association of Australia.

The base of all footing trenches should be carefully inspected to ensure that a satisfactory founding medium is achieved. If any doubt exists to the suitability or otherwise of the founding medium, this office should be consulted immediately.

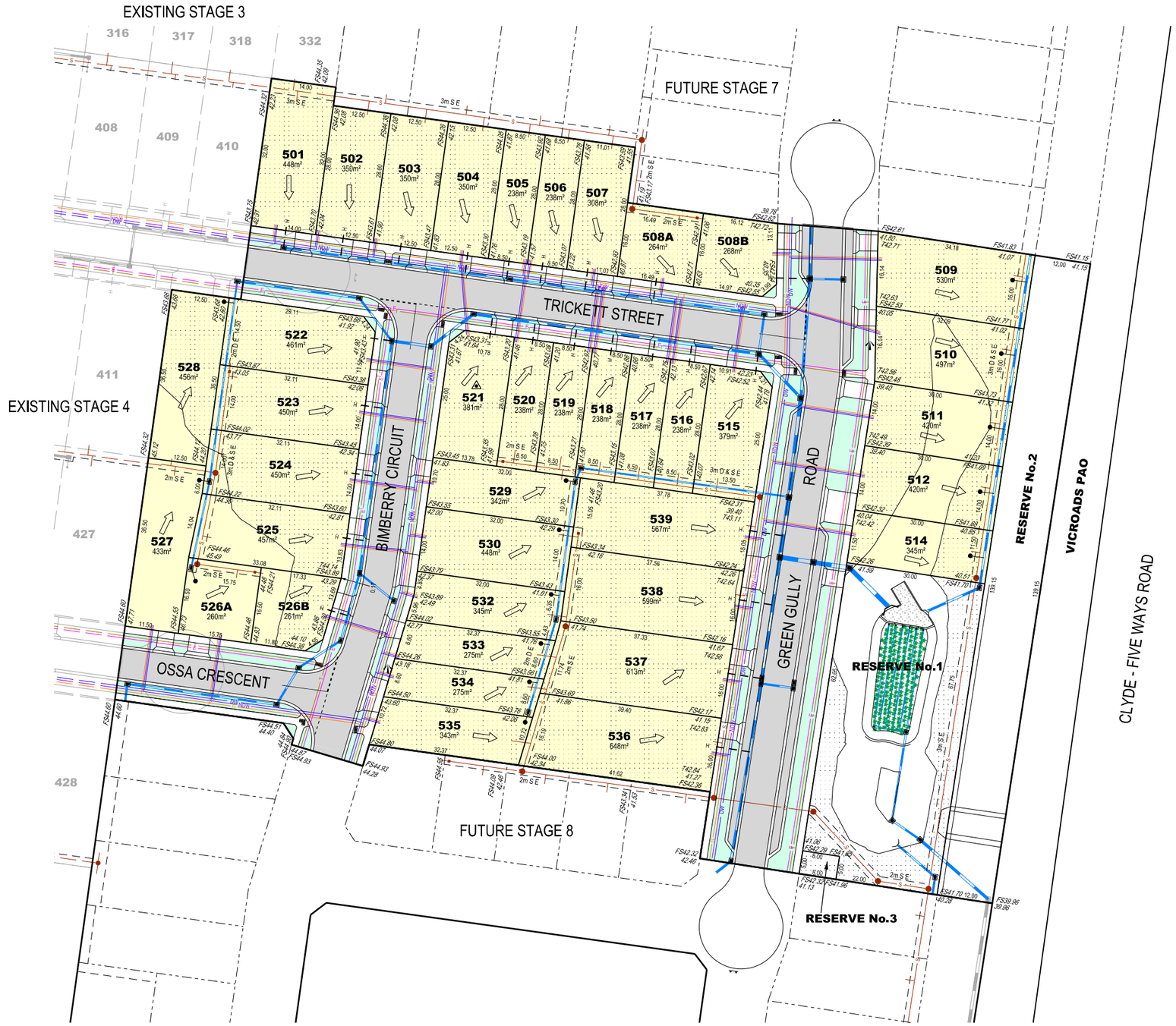
Civil Geotechnical Services

Peter Fry

SERVICE OFFSET TABLE

STREET \ SERVICE	WATER	ND WATER	GAS	POWER	NBN	SEWER
TRICKETT STREET	3.1 N	2.6 N	1.85 N	2.6 S	2.1 S	N/A
BIMBERRY CIRCUIT	3.1 E	2.6 E	2.1 E	2.6 W	2.1 W	N/A
OSSA CRESCENT	3.1 S	2.6 S	2.1 S	2.6 N	2.1 N	N/A
GREEN GULLY ROAD	3.1 W	2.6 W	2.1 W	2.6 E	2.1 E	1.0 W

NOTE: OFFSETS ARE FROM ROAD RESERVE BOUNDARY



1. The fill depth shown on this plan is for fill placed during construction of the subdivision while the site is under the control of Beveridge Williams and Co Pty Ltd. Beveridge Williams and Co Pty Ltd has no further knowledge or records of any other filling works throughout this subdivision.
2. Fill less than 150mm in depth is not shown on this plan.
3. The depth of fill can be determined by calculating the depth between
   a) the existing surface surveyed by Beveridge Williams & Co Pty Ltd undertaken September 2010 (ref: M3739-FL); and
   b) the proposed design surface shown on the allotments on this plan.
4. The fill depths shown do not take into consideration any breaching, grubbing and removal of topsoil which may occurr prior to filling of the land.
5. During the subdivision construction excavation works within the easements shown on this plan may be undertaken for the purposes of laying drainage, electrical, telecommunications, water and sewer main infrastructure.
6. Fill in reserves is not shown.
7. This plan should be read in conjunction with the plan of subdivision.

LEGEND

- PROPERTY INLETS / HOUSE DRAIN
- PROPOSED DRAINAGE (PIT)
- EXISTING DRAINAGE
- PROPOSED SEWERAGE (MH, IS, MS)
- EXISTING SEWERAGE
- WATER/NDW WATER/GAS/ELEC/NBN MAINS (DW, NDW, G, E, T)
- Ex WATER/NDW WATER/GAS/ELEC/OVERHEAD ELEC/NBN MAINS (DW, NDW, G, E, T)
- SERVICE CONDUITS - GAS (G) - WATER (W) - NON-DRINKING WATER (W)
- VEHICLE CROSSINGS
- EASEMENT
- EXTENT OF CUT & FILL
- BATTER SLOPE
- TACTILE GROUND SURFACE INDICATORS
- LOT RUNOFF DIRECTION
- FINISHED SURFACE LEVEL AT PROPERTY BOUNDARY 737.52
- FINISHED SURFACE LEVEL AT TOP OF BATTER FS38.05
- EXISTING SURFACE LEVEL 37.69
- PERMANENT SURVEY MARK
- TEMPORARY BENCH MARK
- FILL AREA > 150mm

PRELIMINARY PRINT
NOT FOR CONSTRUCTION

Rev	Description	Date	By	App
P3	AMENDED FILL AREA FROM EXISTING SURFACE	01.10.14	RH	
P2	REMOVED LOTS 513 AND 531	21.03.14	RH	
P1	FIRST ISSUE	15.11.13	RH	

0 5 10 20 30 40 50
1:500 @ A1
1:1000 @ A3

Designed R.HABEL
Date 13.11.13
Drawn L.SUTHERLAND
Approved C.WHITE
Date APPDT
PS Number PS708779H

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Project Details: PASADENA STAGE 5
CLYDE DEVELOPMENTS
CITY OF CASEY

Drawing Title: ENGINEERING DESIGN FOR CONTRACT OF SALE

Scale: 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
3830	05	SP 101	P3

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