

Shadforth's Civil Contractors
99 Sandalwood Lane
Forest Glen QLD 4556

675890.00
31 January 2017
SJ/CB

Attention: Ben Palmer

Email: Ben.Palmer@shadcivil.com.au

Dear Sirs

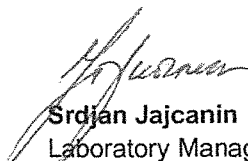
Geotechnical Earthworks Inspection and Testing
Rosehawn Estate Bulk Filling - Stage 5
Bassetts Lane, Rosewood

Please find attached reports for Level 1 filling placed at the above mentioned project and issued to:

- Residev Pty Ltd issued on 22 January 2016.
- Shadforth's Civil Contractors issued on 23 November 2016.


We trust that the above information is suitable for your present requirements. Should you have any queries, please do not hesitate to contact the undersigned.

Yours faithfully
Douglas Partners Pty Ltd



Srdjan Jajcanin
Laboratory Manager

Reviewed by



Chris Bell
Principal

Attachments: Shadforth's and SEE Civil - Level One Reports Stage 5

Shadforth's Civil Contractors Pty Ltd
99 Sandalwood Lane
FOREST GLEN QLD 4556

Project 675890.00
23 November 2016
SJ:BS

Attention: Mr Ben Palmer

Email: Ben.Palmer@shadcivil.com.au

Dear Sirs

**Report on Bulk Earthworks Level 1 Inspection and Testing
Proposed Residential Subdivision - Rosehaven Estate Stage 5
Bassett Lane, Rosewood**

1. Introduction

This report presents a summary of geotechnical inspections and bulk earthworks testing operations associated with Stage 5 of the Rosehaven Estate residential subdivision, located at Bassett Lane, Rosewood.

The scope of inspection and testing provided by Douglas Partners Pty Ltd (DP) comprised full-time supervision of earthworks operations (i.e 'Level 1' inspection and testing) as defined in AS 3798-2007 "Guidelines on Earthworks for Commercial and Residential Developments".

2. Earthworks Activities

2.1 Extent of Works

The extent of bulk filling placed for Stage 5 of the residential subdivision is indicated on Drawing 1 attached. Broadly, the earthworks comprised filling to approximately 1.1 m depth at the northern end decreasing to 0.1 m depth at southern end of Stage 5.

2.2 Stripping and Clearing

A senior geotechnician inspected proposed filling areas where previous filling was placed by SEE Civil Pty Ltd between 2 July to 11 September 2015. Between 0.5 m and 1.0 m depth of filling was placed over this period with Level 1 inspection and testing provided by DP (Project 68586 dated 2015). The exposed subgrade comprised silty clay filling estimated to be of firm to stiff strength consistency across the entire area.

2.3 Test Rolling

The exposed subgrade was test rolled with a 40 tonne loaded articulated dump truck. No deep seated movement was observed under the wheels during rolling.

2.4 Filling Materials

The materials used as filling at lower levels comprised natural clays won from on-site excavations. Filling material used at the upper levels comprised natural sandy silty clays won from Thagoona Road, Rosewood and Clarence Avenue, Springfield.

2.5 Specification

The specification for bulk filling was compaction to 95% Standard maximum dry density ratio, with moisture contents maintained within 2.0% of the optimum moisture content for Standard compaction (OMC). A test frequency of one field density test per 500 m³ of compacted material was deemed appropriate for the project based on AS3798.

2.6 Placement and Testing of Filling

The filling was placed by articulated dump truck then spread by a Cat 825 compactor and 14 tonne pad foot roller. The filling was placed in approx. 200 mm loose thickness layers.

Observations were made by a senior geotechnician who was present on-site full-time during the works. At completion of filling, each layer was presented for testing.

Density testing was conducted using the nuclear gauge method (AS 1289.5.8.1) and relative compaction was determined using the maximum dry density method (AS 1289.5.1.1). Test levels were recorded relative to site survey markings and coordinates were taken by the geotechnician with a handheld GPS. The results of the density tests are summarised in Table 1 below.

Table 1: Summary of Density Testing

| Item | Compaction | Moisture Variation |
|--|--------------------------|------------------------------|
| Specification | Minimum 95% Standard | Within 2.0% of OMC* |
| No. of Tests | 53 | 53 |
| Range of Results | 95.0% to 105.0% Standard | 2.0% dry to 2.0% wet of OMC* |
| No. of Tests Outside the Specification | 0 | 0 |
| Mean (all tests) | 99.0% Standard | 0.2% dry of OMC* |

* OMC Optimum Moisture Content

3. Comments

DP undertook 'Level 1' inspection and testing of bulk earthworks as defined in AS 3798–2007 "Guidelines on Earthworks for Commercial and Residential Developments". Based on the inspections and test results provided, it is considered that the placement and compaction of the bulk filling within Stage 5 of the proposed residential subdivision at Bassett Lane, Rosewood by Shadforths Civil Contractors Pty Ltd over the period from 16 August 2016 to 19 September 2016, has been carried out in accordance with the specification requirements.

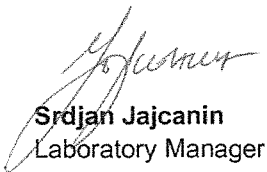
DP does not undertake to guarantee the work of the contractors nor relieve their responsibility to produce a completed product conforming to the requirements of the specification. Furthermore for building on controlled filling areas, consideration should be given by the user to the following:

- possible disruption of the compacted filling by the installation of services, footings and retaining walls;
- the possibility that additional filling has been placed after the date of the last field density test or at times when DP has not been notified that filling operations were in progress;
- adequate confinement of the filled areas, including filled areas supported by boulder walls;
- the suitability of the filled land to support structures of various types without excessive deflection. In particular, the shrink-swell properties of the filling and natural soils must be considered in foundation/footing slab design and in detailing the dwellings; and
- variations in filling depth.


We trust that the above information is suitable for your present requirements. Should you have any queries, please do not hesitate to contact the undersigned.

Yours faithfully

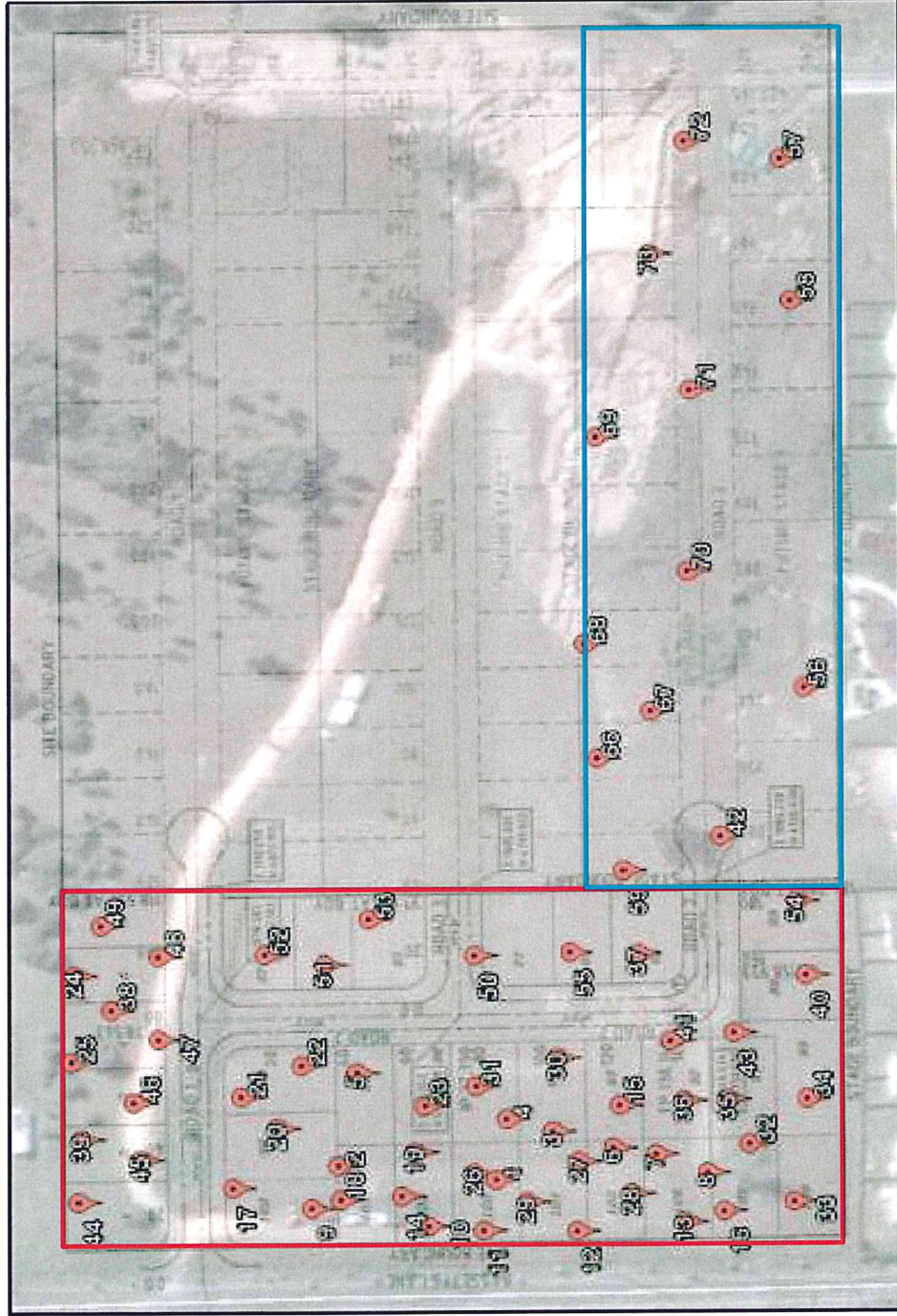
Douglas Partners Pty Ltd


Srdjan Jajcanin
Laboratory Manager

Reviewed by


Bruce Stewart
Principal

Attachments: About This Report
 Drawing 1 - Test location plan
 Field Density Test Reports




Notes:

1. Test locations are approximate only and are shown with reference to existing and proposed site features.
2. Drawing adapted from plan 16-102-04 Rev. B provided by Client.

Key:

- Stage 5
 Stage 6

| | | |
|---|--|--------------------|
|  | Stages 5, 6 Filling Test Locations Rosehaven Estate Rosewood QLD 4340 | PROJECT No: 675890 |
| | CLIENT: Shadforth's Civil Contractors | DRAWING No: 3 |
| | OFFICE: Brisbane DATE: 31.01.2017 | REVISION: B |

Residev Pty Ltd
PO Box 487
NOOSA HEADS QLD 4567

Project 68586.00
22 January 2016
SJ:CB

Attention: Mr Noel Shipp

Email: noel@lenniumgroup.com.au

Dear Sirs

**Report on Bulk Earthworks Level 1 Inspection and Testing
Proposed Residential Development
Bassetts Lane, Rosewood Stage 5
Allotments from 59 to 77 and from 86 to 108**

1. Introduction

This report presents a summary of geotechnical inspections and bulk earthworks testing operations associated with a proposed residential subdivision, located at Bassetts Lane, Rosewood. This report only covers Lots 59-77 and 86-108 within Stage 5.

The scope of inspection and testing provided by Douglas Partners Pty Ltd (DP) comprised full-time supervision of earthworks operations (i.e 'Level 1' inspection and testing) as defined in AS 3798-2007 "Guidelines on Earthworks for Commercial and Residential Developments".

2. Earthworks Activities

2.1 Stripping and Clearing

A senior geotechnician observed the stripping of vegetation and topsoil beneath the proposed filling area. The exposed subgrade comprised natural silty clay estimated to be of soft to firm strength consistency across the entire filling area.

2.2 Test Rolling

Following stripping, the exposed subgrade was test rolled with an 40 tonne loaded dump truck, during which no deeper movement was observed under the wheels.

2.2 Filling Materials

The materials used as filling comprised natural silty clay, won from excavation of the on-site retention basin

2.3 Specification

The specification for bulk filling was compaction to 95% Standard maximum dry density ratio, with moisture contents maintained within 2.0% of the optimum moisture content for Standard compaction. A test frequency of one field density test per 500m³ of compacted material based was considered appropriate for the project based on AS3798.

2.4 Placement and Testing of Filling

The filling was spread by excavator and compacted by a 14 tonne pad foot roller. The filling was placed in 200 mm loose thickness layers.

Observations were made by a senior geotechnician who was present on-site full-time during the works. At completion of filling, each layer was presented for testing.

Density testing was conducted by using the nuclear gauge method (AS 1289.5.8.1) and relative compaction was determined using the maximum dry density method (AS 1289.5.1.1). Test levels were recorded relative to site survey markings and coordinates were taken by the geotechnician with a handheld GPS. The results of the density tests are summarised in Table 1 below.

Table 1: Summary of Density Testing

| Item | Compaction | Moisture Variation |
|--|--------------------------|-----------------------------|
| Specification | Minimum 95% Standard | Within 2.0% of OMC |
| No. of Tests | 28 | 28 |
| Range of Results | 95.0% to 107.0% Standard | 3.0% dry to 0.5% wet of OMC |
| No. of Tests Outside the Specification | 0 | 13* |
| Mean (all tests) | 98.1% Standard | 1.7% dry of OMC |

* 13 tests were placed drier than 2% dry of OMC to assist in compaction of the high plasticity clays. These clays may soften and swell if subjected to increases in moisture content.

The frequency of testing was approximately one test per compacted layer due to the small size of area with deep filling.

3. Comments

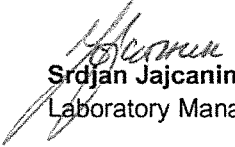
DP undertook 'Level 1' inspection and testing of bulk earthworks as defined in AS 3798–2007 "Guidelines on Earthworks for Commercial and Residential Developments". Based on the inspections and test results provided, it is considered that the placement and compaction of the bulk filling within lots 59 to 77 and 86 to 108 of Stage 5 of the proposed residential subdivision at Bassetts Lane, Rosewood SEE Civil Pty Ltd over the period from 2 July 2015 to 11 September 2015, has been carried out in accordance with the specification requirements.

DP does not undertake to guarantee the work of the contractors nor relieve their responsibility to produce a completed product conforming to the requirements of the specification. Furthermore for building on controlled filling areas, consideration should be given by the user to the following:

- possible disruption of the compacted filling by the installation of services, footings and retaining walls;
- the possibility that additional filling has been placed after the date of the last field density test or at times when DP has not been notified that filling operations were in progress;
- adequate confinement of the filled areas, including filled areas supported by boulder walls;
- the suitability of the filled land to support structures of various types without excessive deflection. In particular, the shrink-swell properties of the filling and natural soils must be considered in foundation/footing slab design and in detailing the dwellings; and
- variations in filling depth.

We trust that the above information is suitable for your present requirements. Should you have any queries, please do not hesitate to contact the undersigned.

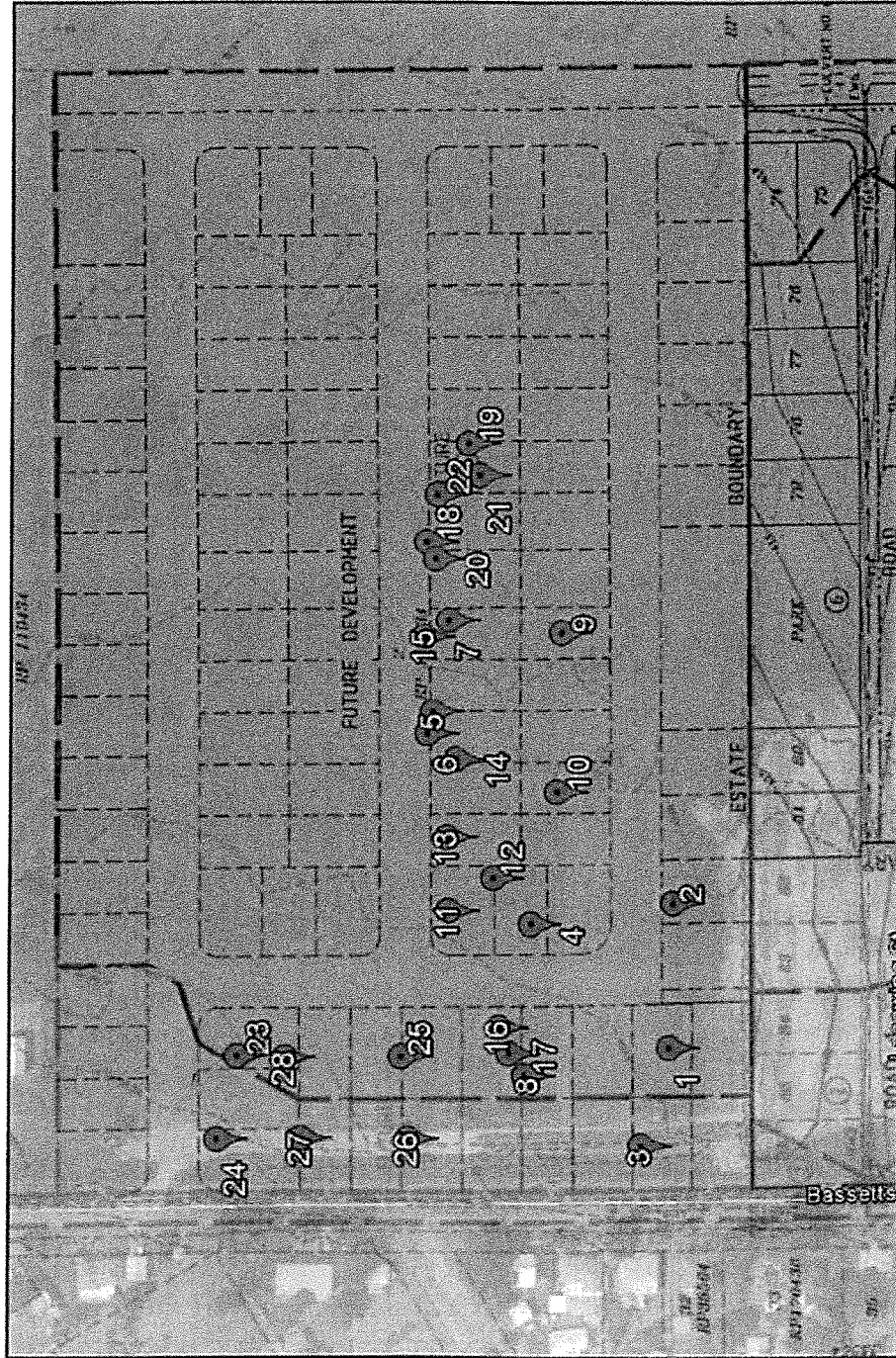
Yours faithfully
Douglas Partners Pty Ltd


Srdjan Jajcanin
Laboratory Manager

Reviewed by



Chris Bell
Principal

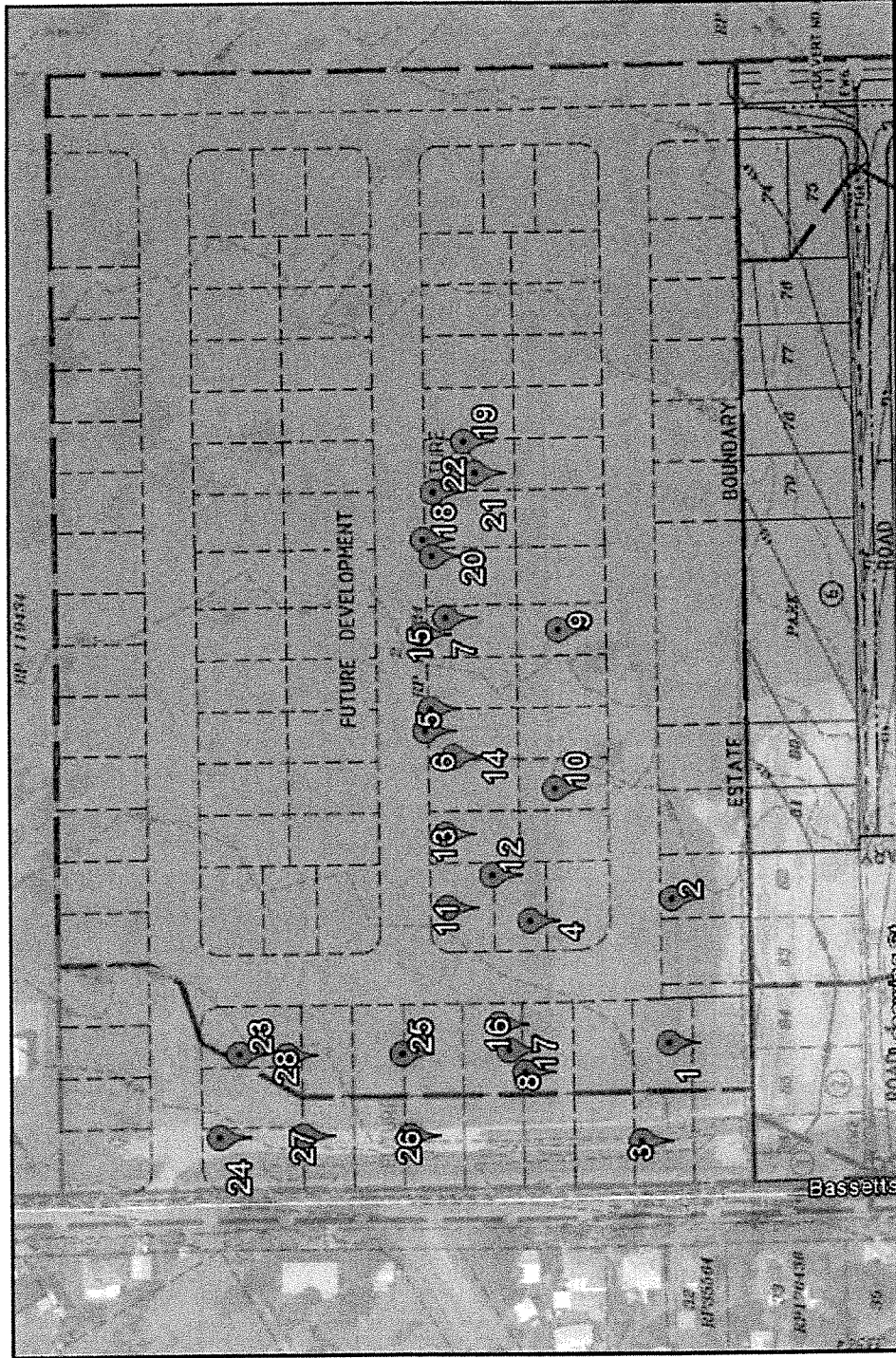
Attachments: About This Report
 Drawing 1 - Test location plan
 Field Density Test Reports



Notes:


1. Test locations are approximate only and are shown with reference to existing and proposed site features.
2. Drawing adapted from plan 12-101-13 Rev. B provided by client

| | | | | | |
|--|---------|-------------------|-------------------------------------|-------------|-------|
|  Douglas Partners Geotechnics / Environment / Groundwater | CLIENT: | See Civil Pty Ltd | Stage 5 Bulk Filling Test Locations | PROJECT No: | 68586 |
| | OFFICE: | Brisbane | Rosehaven Estate | DRAWING No: | 1 |
| | DATE: | 22.01.2016 | Bassetts Lane Rosewood QLD 4340 | REVISION: | A |



Notes:

1. Test locations are approximate only and are shown with reference to existing and proposed site features.
2. Drawing adapted from plan 12-101-13 Rev. B provided by client

| | | | |
|--|---------------------------|-------------------------------------|-------------------|
|  Douglas Partners Geotechnics / Environment / Groundwater | CLIENT: See Civil Pty Ltd | STAGE 5 Bulk Filling Test Locations | PROJECT No: 68586 |
| | OFFICE: Brisbane | Rosehaven Estate | DRAWING No: 1 |
| | DATE: 22.01.2016 | Bassetts Lane Rosewood QLD 4340 | REVISION: A |