

**Geotechnical Report
Level One Inspection and Testing
Individual Lot Report**

**Lot 501
Summerhill Estate Stage 5
Cranbourne South**

Prepared for:

The Land Owner

Project 10194

14th September 2018

Prepared by:

TERRA FIRMA LABORATORIES
Geotechnical Inspection and Testing Authority

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Geotechnical Report Level One Inspection and Testing Summerhill Estate Stage 5 Lot 501

1 Introduction

Terra Firma Laboratories was engaged by Streetworks Pty Ltd as the geotechnical inspection and testing authority to provide Level 1 supervision and testing works on the earthworks component for Summerhill Estate Stage 5 Lot 501. This work was conducted over the period of 27/03/2018 to 05/04/2018.

This report presents that the allotment earthworks was carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development and in compliance with the compaction control specifications established by the contractor.

2 Scope of Works

2.1 Areas of work

The area of work included lots 502 through to 518. The areas of work also included lot 501 which had fill placed in a non-structural area, there was no test performed on the lot but fill was placed under level one supervision. The site will be a residential estate.

The area on which fill was placed is shown on site plan (Appendix 1 which is shown in the level one report for the entire stage) based on drawings prepared by GPR Consulting and provided by Streetworks Pty Ltd.

The supervision work by Terra Firma Laboratories involved both inspection of sub grade preparation work and full time inspection and testing of fill placement.

2.2 Specification

The placement of fill on the areas of work was to be carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development, as directed by Streetworks Pty Ltd. At all times during placement of fill materials Terra Firma Laboratories maintained a Geotechnical Technician on site to perform the supervision and testing as required by AS3798-2007.

A technical specification for compaction control requirements was provided by Streetworks Pty Ltd and established that:

As referenced from AS3798-2007 (Section 5.2) establishes a specification requirement for a minimum density ratio of not less than 95% noting that soils containing more than 20% of particles coarser than 37.5mm cannot be tested for relative compaction using the procedures of AS1289.

Field density testing shall be undertaken at a frequency of not less than 3 tests per visit.

Test Rolling is required for all layers of structural fill and materials within 150mm of permanent subgrade level so as to withstand test rolling without visible deformation or springing. Corrective action is required where unstable areas exceed 20% of the area being considered by test rolling.

3 Inspection and Testing

3.1 Sub-Grade Preparation

Subgrade preparation involved stripping the site down of topsoil and organic matter to a depth of approximately 200mm below existing levels detailed on the site plans. The sub-grade area was then proof-rolled to determine soft or otherwise unsuitable zones and such zones rectified as necessary. The sub-grade was watered and scarified prior to fill placement to aid layer bonding.

3.2 Fill materials

The materials used as fill were locally sourced and observed to generally consist of Silty Clay, sourced from stockpiled materials on site. No particles greater than 150mm were observed. The fill was nominated as clean fill by the contractor.

3.3 Fill Construction

The contractor had the following plant available on-site during the construction period for use in the fill placement:

- Compactor
- Scraper
- Trucks
- Dozer
- Excavator
- Water Cart

All fill was placed in layers of thicknesses not exceeding 300mm. The work area was typically a 2 or 3 lot area on any one particular day. At the completion of a placed layer, compaction testing was performed to confirm appropriate compaction had been achieved and supported the observations made.

It was observed that finished levels were in accordance with levels marked on site by survey. These levels are shown on site plans attached in Appendix 1 which is shown in the level one report for the entire stage.

The final 300mm of fill placed across the site was placed as a topsoil layer/ growing medium and should be considered as non-structural, as it was placed in an uncontrolled manner, as allowed by specifications.

4 Compaction Control Testing

Testing comprised of a total of 17 in-situ density tests, with a summary of results included in Appendix 2 which is shown in the level one report for the entire stage. Test Reports are referenced in Appendix 3 which is shown in the level one report for the entire stage.

It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. Each lot does not necessarily require a compaction test to comply. The compaction control testing indicated that the engineered fill on all lots complied with the technical specification.

5 Uncontrolled Works

Terra Firma Laboratories cannot verify any works completed by others after the final date specified in the introduction. Uncontrolled works may include, but not limited to trenching for services, cut and fill works for slab preparation or subsequent removal of vegetation and back fill of holes.

6 Clean Fill

Terra Firma Laboratories cannot guarantee that the material used as a filling medium is free from chemical or other contamination.

7 Statement of Compliance

Inspections and testing of the fill areas at this site indicate that both sub grade preparation and fill placement have been conducted in accordance with the specification and that the completed fill areas of greater than 300mm, as shown on the site plan attached, and not any preceding the 27/03/2018 or work completed after the 05/04/2018, may be certified as being compliant with the specification.

For and on behalf of
Terra Firma Laboratories,



Tom Seymour
Managing Director

**Geotechnical Report
Level One Inspection and Testing
Individual Lot Report**

**Summerhill Estate Stage 5
Cranbourne South
Lot 502**

Prepared for:

The Land Owner

Project 10194

22 August 2018

Prepared by:

TERRA FIRMA LABORATORIES
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Geotechnical Report Level One Inspection and Testing Summerhill Estate Stage 5 Lot 502

1 Introduction

Terra Firma Laboratories was engaged by Streetworks Pty Ltd as the geotechnical inspection and testing authority to provide Level 1 supervision and testing works on the earthworks component for Summerhill Estate Stage 5 Lot 502. This work was conducted over the period of 27/03/2018 to 05/04/2018.

This report presents that the allotment earthworks was carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development and in compliance with the compaction control specifications established by the contractor.

2 Scope of Works

2.1 Areas of work

The areas of work included lots 502 through to 518. The site will be a residential estate.

The area on which fill was placed is shown on site plan (Appendix 1 as shown in the level one report for the entire stage) based on drawings prepared by GPR Consulting and provided by Streetworks Pty Ltd.

The supervision work by Terra Firma Laboratories involved both inspection of sub grade preparation work and full time inspection and testing of fill placement.

2.2 Specification

The placement of fill on the areas of work was to be carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development, as directed by Streetworks Pty Ltd. At all times during placement of fill materials Terra Firma Laboratories maintained a Geotechnical Technician on site to perform the supervision and testing as required by AS3798-2007.

A technical specification for compaction control requirements was provided by Streetworks Pty Ltd and established that:

As referenced from AS3798-2007 (Section 5.2) establishes a specification requirement for a minimum density ratio of not less than 95% noting that soils containing more than 20% of particles coarser than 37.5mm cannot be tested for relative compaction using the procedures of AS1289.

Field density testing shall be undertaken at a frequency of not less than 3 tests per visit.

Test Rolling is required for all layers of structural fill and materials within 150mm of permanent subgrade level so as to withstand test rolling without visible deformation or springing. Corrective action is required where unstable areas exceed 20% of the area being considered by test rolling.

3 Inspection and Testing

3.1 Sub-Grade Preparation

Subgrade preparation involved stripping the site down of topsoil and organic matter to a depth of approximately 200mm below existing levels detailed on the site plans. The sub-grade area was then proof-rolled to determine soft or otherwise unsuitable zones and such zones rectified as necessary. The sub-grade was watered and scarified prior to fill placement to aid layer bonding.

3.2 Fill materials

The materials used as fill were locally sourced and observed to generally consist of Silty Clay, sourced from stockpiled materials on site. No particles greater than 150mm were observed. The fill was nominated as clean fill by the contractor.

3.3 Fill Construction

The contractor had the following plant available on-site during the construction period for use in the fill placement:

- Compactor
- Scraper
- Trucks
- Dozer
- Excavator
- Water Cart

All fill was placed in layers of thicknesses not exceeding 300mm. The work area was typically a 2 or 3 lot area on any one particular day. At the completion of a placed layer, compaction testing was performed to confirm appropriate compaction had been achieved and supported the observations made.

It was observed that finished levels were in accordance with levels marked on site by survey. These levels are shown on site plans attached in Appendix 1 as shown in the level one report for the entire stage.

The final 300mm of fill placed across the site was placed as a topsoil layer/ growing medium and should be considered as non-structural, as it was placed in an uncontrolled manner, as allowed by specifications.

4 Compaction Control Testing

Testing comprised of a total of 17 in-situ density tests, with a summary of results included in Appendix 2 as shown in the level one report for the entire stage. Test Reports are referenced in Appendix 3 as shown in the level one report for the entire stage.

It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. Each lot does not necessarily require a compaction test to comply. The compaction control testing indicated that the engineered fill on all lots complied with the technical specification.

5 Uncontrolled Works

Terra Firma Laboratories cannot verify any works completed by others after the final date specified in the introduction. Uncontrolled works may include, but not limited to trenching for services, cut and fill works for slab preparation or subsequent removal of vegetation and back fill of holes.

6 Clean Fill

Terra Firma Laboratories cannot guarantee that the material used as a filling medium is free from chemical or other contamination.

7 Statement of Compliance

Inspections and testing of the fill areas at this site indicate that both sub grade preparation and fill placement have been conducted in accordance with the specification and that the completed fill areas of greater than 300mm, as shown on the site plan attached, and not any preceding the 27/03/2018 or work completed after the 05/04/2018, may be certified as being compliant with the specification.

For and on behalf of
Terra Firma Laboratories,



Tom Seymour
Managing Director

**Geotechnical Report
Level One Inspection and Testing
Individual Lot Report**

**Summerhill Estate Stage 5
Cranbourne South
Lot 503**

Prepared for:

The Land Owner

Project 10194

22 August 2018

Prepared by:

TERRA FIRMA LABORATORIES
Geotechnical Inspection and Testing Authority

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Geotechnical Report Level One Inspection and Testing Summerhill Estate Stage 5 Lot 503

1 Introduction

Terra Firma Laboratories was engaged by Streetworks Pty Ltd as the geotechnical inspection and testing authority to provide Level 1 supervision and testing works on the earthworks component for Summerhill Estate Stage 5 Lot 503. This work was conducted over the period of 27/03/2018 to 05/04/2018.

This report presents that the allotment earthworks was carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development and in compliance with the compaction control specifications established by the contractor.

2 Scope of Works

2.1 Areas of work

The areas of work included lots 502 through to 518. The site will be a residential estate.

The area on which fill was placed is shown on site plan (Appendix 1 as shown in the level one report for the entire stage) based on drawings prepared by GPR Consulting and provided by Streetworks Pty Ltd.

The supervision work by Terra Firma Laboratories involved both inspection of sub grade preparation work and full time inspection and testing of fill placement.

2.2 Specification

The placement of fill on the areas of work was to be carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development, as directed by Streetworks Pty Ltd. At all times during placement of fill materials Terra Firma Laboratories maintained a Geotechnical Technician on site to perform the supervision and testing as required by AS3798-2007.

A technical specification for compaction control requirements was provided by Streetworks Pty Ltd and established that:

As referenced from AS3798-2007 (Section 5.2) establishes a specification requirement for a minimum density ratio of not less than 95% noting that soils containing more than 20% of particles coarser than 37.5mm cannot be tested for relative compaction using the procedures of AS1289.

Field density testing shall be undertaken at a frequency of not less than 3 tests per visit.

Test Rolling is required for all layers of structural fill and materials within 150mm of permanent subgrade level so as to withstand test rolling without visible deformation or springing. Corrective action is required where unstable areas exceed 20% of the area being considered by test rolling.

3 Inspection and Testing

3.1 Sub-Grade Preparation

Subgrade preparation involved stripping the site down of topsoil and organic matter to a depth of approximately 200mm below existing levels detailed on the site plans. The sub-grade area was then proof-rolled to determine soft or otherwise unsuitable zones and such zones rectified as necessary. The sub-grade was watered and scarified prior to fill placement to aid layer bonding.

3.2 Fill materials

The materials used as fill were locally sourced and observed to generally consist of Silty Clay, sourced from stockpiled materials on site. No particles greater than 150mm were observed. The fill was nominated as clean fill by the contractor.

3.3 Fill Construction

The contractor had the following plant available on-site during the construction period for use in the fill placement:

- Compactor
- Scraper
- Trucks
- Dozer
- Excavator
- Water Cart

All fill was placed in layers of thicknesses not exceeding 300mm. The work area was typically a 2 or 3 lot area on any one particular day. At the completion of a placed layer, compaction testing was performed to confirm appropriate compaction had been achieved and supported the observations made.

It was observed that finished levels were in accordance with levels marked on site by survey. These levels are shown on site plans attached in Appendix 1 as shown in the level one report for the entire stage.

The final 300mm of fill placed across the site was placed as a topsoil layer/ growing medium and should be considered as non-structural, as it was placed in an uncontrolled manner, as allowed by specifications.

4 Compaction Control Testing

Testing comprised of a total of 17 in-situ density tests, with a summary of results included in Appendix 2 as shown in the level one report for the entire stage. Test Reports are referenced in Appendix 3 as shown in the level one report for the entire stage.

It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. Each lot does not necessarily require a compaction test to comply. The compaction control testing indicated that the engineered fill on all lots complied with the technical specification.

5 Uncontrolled Works

Terra Firma Laboratories cannot verify any works completed by others after the final date specified in the introduction. Uncontrolled works may include, but not limited to trenching for services, cut and fill works for slab preparation or subsequent removal of vegetation and back fill of holes.

6 Clean Fill

Terra Firma Laboratories cannot guarantee that the material used as a filling medium is free from chemical or other contamination.

7 Statement of Compliance

Inspections and testing of the fill areas at this site indicate that both sub grade preparation and fill placement have been conducted in accordance with the specification and that the completed fill areas of greater than 300mm, as shown on the site plan attached, and not any preceding the 27/03/2018 or work completed after the 05/04/2018, may be certified as being compliant with the specification.

For and on behalf of
Terra Firma Laboratories,



Tom Seymour
Managing Director

**Geotechnical Report
Level One Inspection and Testing
Individual Lot Report**

**Summerhill Estate Stage 5
Cranbourne South
Lot 504**

Prepared for:

The Land Owner

Project 10194

22 August 2018

Prepared by:

TERRA FIRMA LABORATORIES
Geotechnical Inspection and Testing Authority

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Geotechnical Report Level One Inspection and Testing Summerhill Estate Stage 5 Lot 504

1 Introduction

Terra Firma Laboratories was engaged by Streetworks Pty Ltd as the geotechnical inspection and testing authority to provide Level 1 supervision and testing works on the earthworks component for Summerhill Estate Stage 5 Lot 504. This work was conducted over the period of 27/03/2018 to 05/04/2018.

This report presents that the allotment earthworks was carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development and in compliance with the compaction control specifications established by the contractor.

2 Scope of Works

2.1 Areas of work

The areas of work included lots 502 through to 518. The site will be a residential estate.

The area on which fill was placed is shown on site plan (Appendix 1 as shown in the level one report for the entire stage) based on drawings prepared by GPR Consulting and provided by Streetworks Pty Ltd.

The supervision work by Terra Firma Laboratories involved both inspection of sub grade preparation work and full time inspection and testing of fill placement.

2.2 Specification

The placement of fill on the areas of work was to be carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development, as directed by Streetworks Pty Ltd. At all times during placement of fill materials Terra Firma Laboratories maintained a Geotechnical Technician on site to perform the supervision and testing as required by AS3798-2007.

A technical specification for compaction control requirements was provided by Streetworks Pty Ltd and established that:

As referenced from AS3798-2007 (Section 5.2) establishes a specification requirement for a minimum density ratio of not less than 95% noting that soils containing more than 20% of particles coarser than 37.5mm cannot be tested for relative compaction using the procedures of AS1289.

Field density testing shall be undertaken at a frequency of not less than 3 tests per visit.

Test Rolling is required for all layers of structural fill and materials within 150mm of permanent subgrade level so as to withstand test rolling without visible deformation or springing. Corrective action is required where unstable areas exceed 20% of the area being considered by test rolling.

3 Inspection and Testing

3.1 Sub-Grade Preparation

Subgrade preparation involved stripping the site down of topsoil and organic matter to a depth of approximately 200mm below existing levels detailed on the site plans. The sub-grade area was then proof-rolled to determine soft or otherwise unsuitable zones and such zones rectified as necessary. The sub-grade was watered and scarified prior to fill placement to aid layer bonding.

3.2 Fill materials

The materials used as fill were locally sourced and observed to generally consist of Silty Clay, sourced from stockpiled materials on site. No particles greater than 150mm were observed. The fill was nominated as clean fill by the contractor.

3.3 Fill Construction

The contractor had the following plant available on-site during the construction period for use in the fill placement:

- Compactor
- Scraper
- Trucks
- Dozer
- Excavator
- Water Cart

All fill was placed in layers of thicknesses not exceeding 300mm. The work area was typically a 2 or 3 lot area on any one particular day. At the completion of a placed layer, compaction testing was performed to confirm appropriate compaction had been achieved and supported the observations made.

It was observed that finished levels were in accordance with levels marked on site by survey. These levels are shown on site plans attached in Appendix 1 as shown in the level one report for the entire stage.

The final 300mm of fill placed across the site was placed as a topsoil layer/ growing medium and should be considered as non-structural, as it was placed in an uncontrolled manner, as allowed by specifications.

4 Compaction Control Testing

Testing comprised of a total of 17 in-situ density tests, with a summary of results included in Appendix 2 as shown in the level one report for the entire stage. Test Reports are referenced in Appendix 3 as shown in the level one report for the entire stage.

It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. Each lot does not necessarily require a compaction test to comply. The compaction control testing indicated that the engineered fill on all lots complied with the technical specification.

5 Uncontrolled Works

Terra Firma Laboratories cannot verify any works completed by others after the final date specified in the introduction. Uncontrolled works may include, but not limited to trenching for services, cut and fill works for slab preparation or subsequent removal of vegetation and back fill of holes.

6 Clean Fill

Terra Firma Laboratories cannot guarantee that the material used as a filling medium is free from chemical or other contamination.

7 Statement of Compliance

Inspections and testing of the fill areas at this site indicate that both sub grade preparation and fill placement have been conducted in accordance with the specification and that the completed fill areas of greater than 300mm, as shown on the site plan attached, and not any preceding the 27/03/2018 or work completed after the 05/04/2018, may be certified as being compliant with the specification.

For and on behalf of
Terra Firma Laboratories,



Tom Seymour
Managing Director

**Geotechnical Report
Level One Inspection and Testing
Individual Lot Report**

**Summerhill Estate Stage 5
Cranbourne South
Lot 505**

Prepared for:

The Land Owner

Project 10194

22 August 2018

Prepared by:

TERRA FIRMA LABORATORIES
Geotechnical Inspection and Testing Authority

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Geotechnical Report Level One Inspection and Testing Summerhill Estate Stage 5 Lot 505

1 Introduction

Terra Firma Laboratories was engaged by Streetworks Pty Ltd as the geotechnical inspection and testing authority to provide Level 1 supervision and testing works on the earthworks component for Summerhill Estate Stage 5 Lot 505. This work was conducted over the period of 27/03/2018 to 05/04/2018.

This report presents that the allotment earthworks was carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development and in compliance with the compaction control specifications established by the contractor.

2 Scope of Works

2.1 Areas of work

The areas of work included lots 502 through to 518. The site will be a residential estate.

The area on which fill was placed is shown on site plan (Appendix 1 as shown in the level one report for the entire stage) based on drawings prepared by GPR Consulting and provided by Streetworks Pty Ltd.

The supervision work by Terra Firma Laboratories involved both inspection of sub grade preparation work and full time inspection and testing of fill placement.

2.2 Specification

The placement of fill on the areas of work was to be carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development, as directed by Streetworks Pty Ltd. At all times during placement of fill materials Terra Firma Laboratories maintained a Geotechnical Technician on site to perform the supervision and testing as required by AS3798-2007.

A technical specification for compaction control requirements was provided by Streetworks Pty Ltd and established that:

As referenced from AS3798-2007 (Section 5.2) establishes a specification requirement for a minimum density ratio of not less than 95% noting that soils containing more than 20% of particles coarser than 37.5mm cannot be tested for relative compaction using the procedures of AS1289.

Field density testing shall be undertaken at a frequency of not less than 3 tests per visit.

Test Rolling is required for all layers of structural fill and materials within 150mm of permanent subgrade level so as to withstand test rolling without visible deformation or springing. Corrective action is required where unstable areas exceed 20% of the area being considered by test rolling.

3 Inspection and Testing

3.1 Sub-Grade Preparation

Subgrade preparation involved stripping the site down of topsoil and organic matter to a depth of approximately 200mm below existing levels detailed on the site plans. The sub-grade area was then proof-rolled to determine soft or otherwise unsuitable zones and such zones rectified as necessary. The sub-grade was watered and scarified prior to fill placement to aid layer bonding.

3.2 Fill materials

The materials used as fill were locally sourced and observed to generally consist of Silty Clay, sourced from stockpiled materials on site. No particles greater than 150mm were observed. The fill was nominated as clean fill by the contractor.

3.3 Fill Construction

The contractor had the following plant available on-site during the construction period for use in the fill placement:

- Compactor
- Scraper
- Trucks
- Dozer
- Excavator
- Water Cart

All fill was placed in layers of thicknesses not exceeding 300mm. The work area was typically a 2 or 3 lot area on any one particular day. At the completion of a placed layer, compaction testing was performed to confirm appropriate compaction had been achieved and supported the observations made.

It was observed that finished levels were in accordance with levels marked on site by survey. These levels are shown on site plans attached in Appendix 1 as shown in the level one report for the entire stage.

The final 300mm of fill placed across the site was placed as a topsoil layer/ growing medium and should be considered as non-structural, as it was placed in an uncontrolled manner, as allowed by specifications.

4 Compaction Control Testing

Testing comprised of a total of 17 in-situ density tests, with a summary of results included in Appendix 2 as shown in the level one report for the entire stage. Test Reports are referenced in Appendix 3 as shown in the level one report for the entire stage.

It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. Each lot does not necessarily require a compaction test to comply. The compaction control testing indicated that the engineered fill on all lots complied with the technical specification.

5 Uncontrolled Works

Terra Firma Laboratories cannot verify any works completed by others after the final date specified in the introduction. Uncontrolled works may include, but not limited to trenching for services, cut and fill works for slab preparation or subsequent removal of vegetation and back fill of holes.

6 Clean Fill

Terra Firma Laboratories cannot guarantee that the material used as a filling medium is free from chemical or other contamination.

7 Statement of Compliance

Inspections and testing of the fill areas at this site indicate that both sub grade preparation and fill placement have been conducted in accordance with the specification and that the completed fill areas of greater than 300mm, as shown on the site plan attached, and not any preceding the 27/03/2018 or work completed after the 05/04/2018, may be certified as being compliant with the specification.

For and on behalf of
Terra Firma Laboratories,



Tom Seymour
Managing Director

**Geotechnical Report
Level One Inspection and Testing
Individual Lot Report**

**Summerhill Estate Stage 5
Cranbourne South
Lot 506**

Prepared for:

The Land Owner

Project 10194

22 August 2018

Prepared by:

TERRA FIRMA LABORATORIES
Geotechnical Inspection and Testing Authority

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Geotechnical Report Level One Inspection and Testing Summerhill Estate Stage 5 Lot 506

1 Introduction

Terra Firma Laboratories was engaged by Streetworks Pty Ltd as the geotechnical inspection and testing authority to provide Level 1 supervision and testing works on the earthworks component for Summerhill Estate Stage 5 Lot 506. This work was conducted over the period of 27/03/2018 to 05/04/2018.

This report presents that the allotment earthworks was carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development and in compliance with the compaction control specifications established by the contractor.

2 Scope of Works

2.1 Areas of work

The areas of work included lots 502 through to 518. The site will be a residential estate.

The area on which fill was placed is shown on site plan (Appendix 1 as shown in the level one report for the entire stage) based on drawings prepared by GPR Consulting and provided by Streetworks Pty Ltd.

The supervision work by Terra Firma Laboratories involved both inspection of sub grade preparation work and full time inspection and testing of fill placement.

2.2 Specification

The placement of fill on the areas of work was to be carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development, as directed by Streetworks Pty Ltd. At all times during placement of fill materials Terra Firma Laboratories maintained a Geotechnical Technician on site to perform the supervision and testing as required by AS3798-2007.

A technical specification for compaction control requirements was provided by Streetworks Pty Ltd and established that:

As referenced from AS3798-2007 (Section 5.2) establishes a specification requirement for a minimum density ratio of not less than 95% noting that soils containing more than 20% of particles coarser than 37.5mm cannot be tested for relative compaction using the procedures of AS1289.

Field density testing shall be undertaken at a frequency of not less than 3 tests per visit.

Test Rolling is required for all layers of structural fill and materials within 150mm of permanent subgrade level so as to withstand test rolling without visible deformation or springing. Corrective action is required where unstable areas exceed 20% of the area being considered by test rolling.

3 Inspection and Testing

3.1 Sub-Grade Preparation

Subgrade preparation involved stripping the site down of topsoil and organic matter to a depth of approximately 200mm below existing levels detailed on the site plans. The sub-grade area was then proof-rolled to determine soft or otherwise unsuitable zones and such zones rectified as necessary. The sub-grade was watered and scarified prior to fill placement to aid layer bonding.

3.2 Fill materials

The materials used as fill were locally sourced and observed to generally consist of Silty Clay, sourced from stockpiled materials on site. No particles greater than 150mm were observed. The fill was nominated as clean fill by the contractor.

3.3 Fill Construction

The contractor had the following plant available on-site during the construction period for use in the fill placement:

- Compactor
- Scraper
- Trucks
- Dozer
- Excavator
- Water Cart

All fill was placed in layers of thicknesses not exceeding 300mm. The work area was typically a 2 or 3 lot area on any one particular day. At the completion of a placed layer, compaction testing was performed to confirm appropriate compaction had been achieved and supported the observations made.

It was observed that finished levels were in accordance with levels marked on site by survey. These levels are shown on site plans attached in Appendix 1 as shown in the level one report for the entire stage.

The final 300mm of fill placed across the site was placed as a topsoil layer/ growing medium and should be considered as non-structural, as it was placed in an uncontrolled manner, as allowed by specifications.

4 Compaction Control Testing

Testing comprised of a total of 17 in-situ density tests, with a summary of results included in Appendix 2 as shown in the level one report for the entire stage. Test Reports are referenced in Appendix 3 as shown in the level one report for the entire stage.

It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. Each lot does not necessarily require a compaction test to comply. The compaction control testing indicated that the engineered fill on all lots complied with the technical specification.

5 Uncontrolled Works

Terra Firma Laboratories cannot verify any works completed by others after the final date specified in the introduction. Uncontrolled works may include, but not limited to trenching for services, cut and fill works for slab preparation or subsequent removal of vegetation and back fill of holes.

6 Clean Fill

Terra Firma Laboratories cannot guarantee that the material used as a filling medium is free from chemical or other contamination.

7 Statement of Compliance

Inspections and testing of the fill areas at this site indicate that both sub grade preparation and fill placement have been conducted in accordance with the specification and that the completed fill areas of greater than 300mm, as shown on the site plan attached, and not any preceding the 27/03/2018 or work completed after the 05/04/2018, may be certified as being compliant with the specification.

For and on behalf of
Terra Firma Laboratories,



Tom Seymour
Managing Director

**Geotechnical Report
Level One Inspection and Testing
Individual Lot Report**

**Summerhill Estate Stage 5
Cranbourne South
Lot 507**

Prepared for:

The Land Owner

Project 10194

22 August 2018

Prepared by:

TERRA FIRMA LABORATORIES
Geotechnical Inspection and Testing Authority

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Geotechnical Report Level One Inspection and Testing Summerhill Estate Stage 5 Lot 507

1 Introduction

Terra Firma Laboratories was engaged by Streetworks Pty Ltd as the geotechnical inspection and testing authority to provide Level 1 supervision and testing works on the earthworks component for Summerhill Estate Stage 5 Lot 507. This work was conducted over the period of 27/03/2018 to 05/04/2018.

This report presents that the allotment earthworks was carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development and in compliance with the compaction control specifications established by the contractor.

2 Scope of Works

2.1 Areas of work

The areas of work included lots 502 through to 518. The site will be a residential estate.

The area on which fill was placed is shown on site plan (Appendix 1 as shown in the level one report for the entire stage) based on drawings prepared by GPR Consulting and provided by Streetworks Pty Ltd.

The supervision work by Terra Firma Laboratories involved both inspection of sub grade preparation work and full time inspection and testing of fill placement.

2.2 Specification

The placement of fill on the areas of work was to be carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development, as directed by Streetworks Pty Ltd. At all times during placement of fill materials Terra Firma Laboratories maintained a Geotechnical Technician on site to perform the supervision and testing as required by AS3798-2007.

A technical specification for compaction control requirements was provided by Streetworks Pty Ltd and established that:

As referenced from AS3798-2007 (Section 5.2) establishes a specification requirement for a minimum density ratio of not less than 95% noting that soils containing more than 20% of particles coarser than 37.5mm cannot be tested for relative compaction using the procedures of AS1289.

Field density testing shall be undertaken at a frequency of not less than 3 tests per visit.

Test Rolling is required for all layers of structural fill and materials within 150mm of permanent subgrade level so as to withstand test rolling without visible deformation or springing. Corrective action is required where unstable areas exceed 20% of the area being considered by test rolling.

3 Inspection and Testing

3.1 Sub-Grade Preparation

Subgrade preparation involved stripping the site down of topsoil and organic matter to a depth of approximately 200mm below existing levels detailed on the site plans. The sub-grade area was then proof-rolled to determine soft or otherwise unsuitable zones and such zones rectified as necessary. The sub-grade was watered and scarified prior to fill placement to aid layer bonding.

3.2 Fill materials

The materials used as fill were locally sourced and observed to generally consist of Silty Clay, sourced from stockpiled materials on site. No particles greater than 150mm were observed. The fill was nominated as clean fill by the contractor.

3.3 Fill Construction

The contractor had the following plant available on-site during the construction period for use in the fill placement:

- Compactor
- Scraper
- Trucks
- Dozer
- Excavator
- Water Cart

All fill was placed in layers of thicknesses not exceeding 300mm. The work area was typically a 2 or 3 lot area on any one particular day. At the completion of a placed layer, compaction testing was performed to confirm appropriate compaction had been achieved and supported the observations made.

It was observed that finished levels were in accordance with levels marked on site by survey. These levels are shown on site plans attached in Appendix 1 as shown in the level one report for the entire stage.

The final 300mm of fill placed across the site was placed as a topsoil layer/ growing medium and should be considered as non-structural, as it was placed in an uncontrolled manner, as allowed by specifications.

4 Compaction Control Testing

Testing comprised of a total of 17 in-situ density tests, with a summary of results included in Appendix 2 as shown in the level one report for the entire stage. Test Reports are referenced in Appendix 3 as shown in the level one report for the entire stage.

It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. Each lot does not necessarily require a compaction test to comply. The compaction control testing indicated that the engineered fill on all lots complied with the technical specification.

5 Uncontrolled Works

Terra Firma Laboratories cannot verify any works completed by others after the final date specified in the introduction. Uncontrolled works may include, but not limited to trenching for services, cut and fill works for slab preparation or subsequent removal of vegetation and back fill of holes.

6 Clean Fill

Terra Firma Laboratories cannot guarantee that the material used as a filling medium is free from chemical or other contamination.

7 Statement of Compliance

Inspections and testing of the fill areas at this site indicate that both sub grade preparation and fill placement have been conducted in accordance with the specification and that the completed fill areas of greater than 300mm, as shown on the site plan attached, and not any preceding the 27/03/2018 or work completed after the 05/04/2018, may be certified as being compliant with the specification.

For and on behalf of
Terra Firma Laboratories,



Tom Seymour
Managing Director

**Geotechnical Report
Level One Inspection and Testing
Individual Lot Report**

**Summerhill Estate Stage 5
Cranbourne South
Lot 508**

Prepared for:

The Land Owner

Project 10194

22 August 2018

Prepared by:

TERRA FIRMA LABORATORIES
Geotechnical Inspection and Testing Authority

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Geotechnical Report Level One Inspection and Testing Summerhill Estate Stage 5 Lot 508

1 Introduction

Terra Firma Laboratories was engaged by Streetworks Pty Ltd as the geotechnical inspection and testing authority to provide Level 1 supervision and testing works on the earthworks component for Summerhill Estate Stage 5 Lot 508. This work was conducted over the period of 27/03/2018 to 05/04/2018.

This report presents that the allotment earthworks was carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development and in compliance with the compaction control specifications established by the contractor.

2 Scope of Works

2.1 Areas of work

The areas of work included lots 502 through to 518. The site will be a residential estate.

The area on which fill was placed is shown on site plan (Appendix 1 as shown in the level one report for the entire stage) based on drawings prepared by GPR Consulting and provided by Streetworks Pty Ltd.

The supervision work by Terra Firma Laboratories involved both inspection of sub grade preparation work and full time inspection and testing of fill placement.

2.2 Specification

The placement of fill on the areas of work was to be carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development, as directed by Streetworks Pty Ltd. At all times during placement of fill materials Terra Firma Laboratories maintained a Geotechnical Technician on site to perform the supervision and testing as required by AS3798-2007.

A technical specification for compaction control requirements was provided by Streetworks Pty Ltd and established that:

As referenced from AS3798-2007 (Section 5.2) establishes a specification requirement for a minimum density ratio of not less than 95% noting that soils containing more than 20% of particles coarser than 37.5mm cannot be tested for relative compaction using the procedures of AS1289.

Field density testing shall be undertaken at a frequency of not less than 3 tests per visit.

Test Rolling is required for all layers of structural fill and materials within 150mm of permanent subgrade level so as to withstand test rolling without visible deformation or springing. Corrective action is required where unstable areas exceed 20% of the area being considered by test rolling.

3 Inspection and Testing

3.1 Sub-Grade Preparation

Subgrade preparation involved stripping the site down of topsoil and organic matter to a depth of approximately 200mm below existing levels detailed on the site plans. The sub-grade area was then proof-rolled to determine soft or otherwise unsuitable zones and such zones rectified as necessary. The sub-grade was watered and scarified prior to fill placement to aid layer bonding.

3.2 Fill materials

The materials used as fill were locally sourced and observed to generally consist of Silty Clay, sourced from stockpiled materials on site. No particles greater than 150mm were observed. The fill was nominated as clean fill by the contractor.

3.3 Fill Construction

The contractor had the following plant available on-site during the construction period for use in the fill placement:

- Compactor
- Scraper
- Trucks
- Dozer
- Excavator
- Water Cart

All fill was placed in layers of thicknesses not exceeding 300mm. The work area was typically a 2 or 3 lot area on any one particular day. At the completion of a placed layer, compaction testing was performed to confirm appropriate compaction had been achieved and supported the observations made.

It was observed that finished levels were in accordance with levels marked on site by survey. These levels are shown on site plans attached in Appendix 1 as shown in the level one report for the entire stage.

The final 300mm of fill placed across the site was placed as a topsoil layer/ growing medium and should be considered as non-structural, as it was placed in an uncontrolled manner, as allowed by specifications.

4 Compaction Control Testing

Testing comprised of a total of 17 in-situ density tests, with a summary of results included in Appendix 2 as shown in the level one report for the entire stage. Test Reports are referenced in Appendix 3 as shown in the level one report for the entire stage.

It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. Each lot does not necessarily require a compaction test to comply. The compaction control testing indicated that the engineered fill on all lots complied with the technical specification.

5 Uncontrolled Works

Terra Firma Laboratories cannot verify any works completed by others after the final date specified in the introduction. Uncontrolled works may include, but not limited to trenching for services, cut and fill works for slab preparation or subsequent removal of vegetation and back fill of holes.

6 Clean Fill

Terra Firma Laboratories cannot guarantee that the material used as a filling medium is free from chemical or other contamination.

7 Statement of Compliance

Inspections and testing of the fill areas at this site indicate that both sub grade preparation and fill placement have been conducted in accordance with the specification and that the completed fill areas of greater than 300mm, as shown on the site plan attached, and not any preceding the 27/03/2018 or work completed after the 05/04/2018, may be certified as being compliant with the specification.

For and on behalf of
Terra Firma Laboratories,



Tom Seymour
Managing Director

**Geotechnical Report
Level One Inspection and Testing
Individual Lot Report**

**Summerhill Estate Stage 5
Cranbourne South
Lot 509**

Prepared for:

The Land Owner

Project 10194

22 August 2018

Prepared by:

TERRA FIRMA LABORATORIES
Geotechnical Inspection and Testing Authority

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Geotechnical Report Level One Inspection and Testing Summerhill Estate Stage 5 Lot 509

1 Introduction

Terra Firma Laboratories was engaged by Streetworks Pty Ltd as the geotechnical inspection and testing authority to provide Level 1 supervision and testing works on the earthworks component for Summerhill Estate Stage 5 Lot 509. This work was conducted over the period of 27/03/2018 to 05/04/2018.

This report presents that the allotment earthworks was carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development and in compliance with the compaction control specifications established by the contractor.

2 Scope of Works

2.1 Areas of work

The areas of work included lots 502 through to 518. The site will be a residential estate.

The area on which fill was placed is shown on site plan (Appendix 1 as shown in the level one report for the entire stage) based on drawings prepared by GPR Consulting and provided by Streetworks Pty Ltd.

The supervision work by Terra Firma Laboratories involved both inspection of sub grade preparation work and full time inspection and testing of fill placement.

2.2 Specification

The placement of fill on the areas of work was to be carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development, as directed by Streetworks Pty Ltd. At all times during placement of fill materials Terra Firma Laboratories maintained a Geotechnical Technician on site to perform the supervision and testing as required by AS3798-2007.

A technical specification for compaction control requirements was provided by Streetworks Pty Ltd and established that:

As referenced from AS3798-2007 (Section 5.2) establishes a specification requirement for a minimum density ratio of not less than 95% noting that soils containing more than 20% of particles coarser than 37.5mm cannot be tested for relative compaction using the procedures of AS1289.

Field density testing shall be undertaken at a frequency of not less than 3 tests per visit.

Test Rolling is required for all layers of structural fill and materials within 150mm of permanent subgrade level so as to withstand test rolling without visible deformation or springing. Corrective action is required where unstable areas exceed 20% of the area being considered by test rolling.

3 Inspection and Testing

3.1 Sub-Grade Preparation

Subgrade preparation involved stripping the site down of topsoil and organic matter to a depth of approximately 200mm below existing levels detailed on the site plans. The sub-grade area was then proof-rolled to determine soft or otherwise unsuitable zones and such zones rectified as necessary. The sub-grade was watered and scarified prior to fill placement to aid layer bonding.

3.2 Fill materials

The materials used as fill were locally sourced and observed to generally consist of Silty Clay, sourced from stockpiled materials on site. No particles greater than 150mm were observed. The fill was nominated as clean fill by the contractor.

3.3 Fill Construction

The contractor had the following plant available on-site during the construction period for use in the fill placement:

- Compactor
- Scraper
- Trucks
- Dozer
- Excavator
- Water Cart

All fill was placed in layers of thicknesses not exceeding 300mm. The work area was typically a 2 or 3 lot area on any one particular day. At the completion of a placed layer, compaction testing was performed to confirm appropriate compaction had been achieved and supported the observations made.

It was observed that finished levels were in accordance with levels marked on site by survey. These levels are shown on site plans attached in Appendix 1 as shown in the level one report for the entire stage.

The final 300mm of fill placed across the site was placed as a topsoil layer/ growing medium and should be considered as non-structural, as it was placed in an uncontrolled manner, as allowed by specifications.

4 Compaction Control Testing

Testing comprised of a total of 17 in-situ density tests, with a summary of results included in Appendix 2 as shown in the level one report for the entire stage. Test Reports are referenced in Appendix 3 as shown in the level one report for the entire stage.

It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. Each lot does not necessarily require a compaction test to comply. The compaction control testing indicated that the engineered fill on all lots complied with the technical specification.

5 Uncontrolled Works

Terra Firma Laboratories cannot verify any works completed by others after the final date specified in the introduction. Uncontrolled works may include, but not limited to trenching for services, cut and fill works for slab preparation or subsequent removal of vegetation and back fill of holes.

6 Clean Fill

Terra Firma Laboratories cannot guarantee that the material used as a filling medium is free from chemical or other contamination.

7 Statement of Compliance

Inspections and testing of the fill areas at this site indicate that both sub grade preparation and fill placement have been conducted in accordance with the specification and that the completed fill areas of greater than 300mm, as shown on the site plan attached, and not any preceding the 27/03/2018 or work completed after the 05/04/2018, may be certified as being compliant with the specification.

For and on behalf of
Terra Firma Laboratories,



Tom Seymour
Managing Director

**Geotechnical Report
Level One Inspection and Testing
Individual Lot Report**

**Summerhill Estate Stage 5
Cranbourne South
Lot 510**

Prepared for:

The Land Owner

Project 10194

22 August 2018

Prepared by:

TERRA FIRMA LABORATORIES
Geotechnical Inspection and Testing Authority

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Geotechnical Report Level One Inspection and Testing Summerhill Estate Stage 5 Lot 510

1 Introduction

Terra Firma Laboratories was engaged by Streetworks Pty Ltd as the geotechnical inspection and testing authority to provide Level 1 supervision and testing works on the earthworks component for Summerhill Estate Stage 5 Lot 510. This work was conducted over the period of 27/03/2018 to 05/04/2018.

This report presents that the allotment earthworks was carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development and in compliance with the compaction control specifications established by the contractor.

2 Scope of Works

2.1 Areas of work

The areas of work included lots 502 through to 518. The site will be a residential estate.

The area on which fill was placed is shown on site plan (Appendix 1 as shown in the level one report for the entire stage) based on drawings prepared by GPR Consulting and provided by Streetworks Pty Ltd.

The supervision work by Terra Firma Laboratories involved both inspection of sub grade preparation work and full time inspection and testing of fill placement.

2.2 Specification

The placement of fill on the areas of work was to be carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development, as directed by Streetworks Pty Ltd. At all times during placement of fill materials Terra Firma Laboratories maintained a Geotechnical Technician on site to perform the supervision and testing as required by AS3798-2007.

A technical specification for compaction control requirements was provided by Streetworks Pty Ltd and established that:

As referenced from AS3798-2007 (Section 5.2) establishes a specification requirement for a minimum density ratio of not less than 95% noting that soils containing more than 20% of particles coarser than 37.5mm cannot be tested for relative compaction using the procedures of AS1289.

Field density testing shall be undertaken at a frequency of not less than 3 tests per visit.

Test Rolling is required for all layers of structural fill and materials within 150mm of permanent subgrade level so as to withstand test rolling without visible deformation or springing. Corrective action is required where unstable areas exceed 20% of the area being considered by test rolling.

3 Inspection and Testing

3.1 Sub-Grade Preparation

Subgrade preparation involved stripping the site down of topsoil and organic matter to a depth of approximately 200mm below existing levels detailed on the site plans. The sub-grade area was then proof-rolled to determine soft or otherwise unsuitable zones and such zones rectified as necessary. The sub-grade was watered and scarified prior to fill placement to aid layer bonding.

3.2 Fill materials

The materials used as fill were locally sourced and observed to generally consist of Silty Clay, sourced from stockpiled materials on site. No particles greater than 150mm were observed. The fill was nominated as clean fill by the contractor.

3.3 Fill Construction

The contractor had the following plant available on-site during the construction period for use in the fill placement:

- Compactor
- Scraper
- Trucks
- Dozer
- Excavator
- Water Cart

All fill was placed in layers of thicknesses not exceeding 300mm. The work area was typically a 2 or 3 lot area on any one particular day. At the completion of a placed layer, compaction testing was performed to confirm appropriate compaction had been achieved and supported the observations made.

It was observed that finished levels were in accordance with levels marked on site by survey. These levels are shown on site plans attached in Appendix 1 as shown in the level one report for the entire stage.

The final 300mm of fill placed across the site was placed as a topsoil layer/ growing medium and should be considered as non-structural, as it was placed in an uncontrolled manner, as allowed by specifications.

4 Compaction Control Testing

Testing comprised of a total of 17 in-situ density tests, with a summary of results included in Appendix 2 as shown in the level one report for the entire stage. Test Reports are referenced in Appendix 3 as shown in the level one report for the entire stage.

It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. Each lot does not necessarily require a compaction test to comply. The compaction control testing indicated that the engineered fill on all lots complied with the technical specification.

5 Uncontrolled Works

Terra Firma Laboratories cannot verify any works completed by others after the final date specified in the introduction. Uncontrolled works may include, but not limited to trenching for services, cut and fill works for slab preparation or subsequent removal of vegetation and back fill of holes.

6 Clean Fill

Terra Firma Laboratories cannot guarantee that the material used as a filling medium is free from chemical or other contamination.

7 Statement of Compliance

Inspections and testing of the fill areas at this site indicate that both sub grade preparation and fill placement have been conducted in accordance with the specification and that the completed fill areas of greater than 300mm, as shown on the site plan attached, and not any preceding the 27/03/2018 or work completed after the 05/04/2018, may be certified as being compliant with the specification.

For and on behalf of
Terra Firma Laboratories,



Tom Seymour
Managing Director

**Geotechnical Report
Level One Inspection and Testing
Individual Lot Report**

**Summerhill Estate Stage 5
Cranbourne South
Lot 511**

Prepared for:

The Land Owner

Project 10194

22 August 2018

Prepared by:

TERRA FIRMA LABORATORIES
Geotechnical Inspection and Testing Authority

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Geotechnical Report Level One Inspection and Testing Summerhill Estate Stage 5 Lot 511

1 Introduction

Terra Firma Laboratories was engaged by Streetworks Pty Ltd as the geotechnical inspection and testing authority to provide Level 1 supervision and testing works on the earthworks component for Summerhill Estate Stage 5 Lot 511. This work was conducted over the period of 27/03/2018 to 05/04/2018.

This report presents that the allotment earthworks was carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development and in compliance with the compaction control specifications established by the contractor.

2 Scope of Works

2.1 Areas of work

The areas of work included lots 502 through to 518. The site will be a residential estate.

The area on which fill was placed is shown on site plan (Appendix 1 as shown in the level one report for the entire stage) based on drawings prepared by GPR Consulting and provided by Streetworks Pty Ltd.

The supervision work by Terra Firma Laboratories involved both inspection of sub grade preparation work and full time inspection and testing of fill placement.

2.2 Specification

The placement of fill on the areas of work was to be carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development, as directed by Streetworks Pty Ltd. At all times during placement of fill materials Terra Firma Laboratories maintained a Geotechnical Technician on site to perform the supervision and testing as required by AS3798-2007.

A technical specification for compaction control requirements was provided by Streetworks Pty Ltd and established that:

As referenced from AS3798-2007 (Section 5.2) establishes a specification requirement for a minimum density ratio of not less than 95% noting that soils containing more than 20% of particles coarser than 37.5mm cannot be tested for relative compaction using the procedures of AS1289.

Field density testing shall be undertaken at a frequency of not less than 3 tests per visit.

Test Rolling is required for all layers of structural fill and materials within 150mm of permanent subgrade level so as to withstand test rolling without visible deformation or springing. Corrective action is required where unstable areas exceed 20% of the area being considered by test rolling.

3 Inspection and Testing

3.1 Sub-Grade Preparation

Subgrade preparation involved stripping the site down of topsoil and organic matter to a depth of approximately 200mm below existing levels detailed on the site plans. The sub-grade area was then proof-rolled to determine soft or otherwise unsuitable zones and such zones rectified as necessary. The sub-grade was watered and scarified prior to fill placement to aid layer bonding.

3.2 Fill materials

The materials used as fill were locally sourced and observed to generally consist of Silty Clay, sourced from stockpiled materials on site. No particles greater than 150mm were observed. The fill was nominated as clean fill by the contractor.

3.3 Fill Construction

The contractor had the following plant available on-site during the construction period for use in the fill placement:

- Compactor
- Scraper
- Trucks
- Dozer
- Excavator
- Water Cart

All fill was placed in layers of thicknesses not exceeding 300mm. The work area was typically a 2 or 3 lot area on any one particular day. At the completion of a placed layer, compaction testing was performed to confirm appropriate compaction had been achieved and supported the observations made.

It was observed that finished levels were in accordance with levels marked on site by survey. These levels are shown on site plans attached in Appendix 1 as shown in the level one report for the entire stage.

The final 300mm of fill placed across the site was placed as a topsoil layer/ growing medium and should be considered as non-structural, as it was placed in an uncontrolled manner, as allowed by specifications.

4 Compaction Control Testing

Testing comprised of a total of 17 in-situ density tests, with a summary of results included in Appendix 2 as shown in the level one report for the entire stage. Test Reports are referenced in Appendix 3 as shown in the level one report for the entire stage.

It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. Each lot does not necessarily require a compaction test to comply. The compaction control testing indicated that the engineered fill on all lots complied with the technical specification.

5 Uncontrolled Works

Terra Firma Laboratories cannot verify any works completed by others after the final date specified in the introduction. Uncontrolled works may include, but not limited to trenching for services, cut and fill works for slab preparation or subsequent removal of vegetation and back fill of holes.

6 Clean Fill

Terra Firma Laboratories cannot guarantee that the material used as a filling medium is free from chemical or other contamination.

7 Statement of Compliance

Inspections and testing of the fill areas at this site indicate that both sub grade preparation and fill placement have been conducted in accordance with the specification and that the completed fill areas of greater than 300mm, as shown on the site plan attached, and not any preceding the 27/03/2018 or work completed after the 05/04/2018, may be certified as being compliant with the specification.

For and on behalf of
Terra Firma Laboratories,



Tom Seymour
Managing Director

**Geotechnical Report
Level One Inspection and Testing
Individual Lot Report**

**Summerhill Estate Stage 5
Cranbourne South
Lot 512**

Prepared for:

The Land Owner

Project 10194

22 August 2018

Prepared by:

TERRA FIRMA LABORATORIES
Geotechnical Inspection and Testing Authority

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Geotechnical Report Level One Inspection and Testing Summerhill Estate Stage 5 Lot 512

1 Introduction

Terra Firma Laboratories was engaged by Streetworks Pty Ltd as the geotechnical inspection and testing authority to provide Level 1 supervision and testing works on the earthworks component for Summerhill Estate Stage 5 Lot 512. This work was conducted over the period of 27/03/2018 to 05/04/2018.

This report presents that the allotment earthworks was carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development and in compliance with the compaction control specifications established by the contractor.

2 Scope of Works

2.1 Areas of work

The areas of work included lots 502 through to 518. The site will be a residential estate.

The area on which fill was placed is shown on site plan (Appendix 1 as shown in the level one report for the entire stage) based on drawings prepared by GPR Consulting and provided by Streetworks Pty Ltd.

The supervision work by Terra Firma Laboratories involved both inspection of sub grade preparation work and full time inspection and testing of fill placement.

2.2 Specification

The placement of fill on the areas of work was to be carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development, as directed by Streetworks Pty Ltd. At all times during placement of fill materials Terra Firma Laboratories maintained a Geotechnical Technician on site to perform the supervision and testing as required by AS3798-2007.

A technical specification for compaction control requirements was provided by Streetworks Pty Ltd and established that:

As referenced from AS3798-2007 (Section 5.2) establishes a specification requirement for a minimum density ratio of not less than 95% noting that soils containing more than 20% of particles coarser than 37.5mm cannot be tested for relative compaction using the procedures of AS1289.

Field density testing shall be undertaken at a frequency of not less than 3 tests per visit.

Test Rolling is required for all layers of structural fill and materials within 150mm of permanent subgrade level so as to withstand test rolling without visible deformation or springing. Corrective action is required where unstable areas exceed 20% of the area being considered by test rolling.

3 Inspection and Testing

3.1 Sub-Grade Preparation

Subgrade preparation involved stripping the site down of topsoil and organic matter to a depth of approximately 200mm below existing levels detailed on the site plans. The sub-grade area was then proof-rolled to determine soft or otherwise unsuitable zones and such zones rectified as necessary. The sub-grade was watered and scarified prior to fill placement to aid layer bonding.

3.2 Fill materials

The materials used as fill were locally sourced and observed to generally consist of Silty Clay, sourced from stockpiled materials on site. No particles greater than 150mm were observed. The fill was nominated as clean fill by the contractor.

3.3 Fill Construction

The contractor had the following plant available on-site during the construction period for use in the fill placement:

- Compactor
- Scraper
- Trucks
- Dozer
- Excavator
- Water Cart

All fill was placed in layers of thicknesses not exceeding 300mm. The work area was typically a 2 or 3 lot area on any one particular day. At the completion of a placed layer, compaction testing was performed to confirm appropriate compaction had been achieved and supported the observations made.

It was observed that finished levels were in accordance with levels marked on site by survey. These levels are shown on site plans attached in Appendix 1 as shown in the level one report for the entire stage.

The final 300mm of fill placed across the site was placed as a topsoil layer/ growing medium and should be considered as non-structural, as it was placed in an uncontrolled manner, as allowed by specifications.

4 Compaction Control Testing

Testing comprised of a total of 17 in-situ density tests, with a summary of results included in Appendix 2 as shown in the level one report for the entire stage. Test Reports are referenced in Appendix 3 as shown in the level one report for the entire stage.

It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. Each lot does not necessarily require a compaction test to comply. The compaction control testing indicated that the engineered fill on all lots complied with the technical specification.

5 Uncontrolled Works

Terra Firma Laboratories cannot verify any works completed by others after the final date specified in the introduction. Uncontrolled works may include, but not limited to trenching for services, cut and fill works for slab preparation or subsequent removal of vegetation and back fill of holes.

6 Clean Fill

Terra Firma Laboratories cannot guarantee that the material used as a filling medium is free from chemical or other contamination.

7 Statement of Compliance

Inspections and testing of the fill areas at this site indicate that both sub grade preparation and fill placement have been conducted in accordance with the specification and that the completed fill areas of greater than 300mm, as shown on the site plan attached, and not any preceding the 27/03/2018 or work completed after the 05/04/2018, may be certified as being compliant with the specification.

For and on behalf of
Terra Firma Laboratories,



Tom Seymour
Managing Director

**Geotechnical Report
Level One Inspection and Testing
Individual Lot Report**

**Summerhill Estate Stage 5
Cranbourne South
Lot 513**

Prepared for:

The Land Owner

Project 10194

22 August 2018

Prepared by:

TERRA FIRMA LABORATORIES
Geotechnical Inspection and Testing Authority

47 National Ave
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Geotechnical Report Level One Inspection and Testing Summerhill Estate Stage 5 Lot 513

1 Introduction

Terra Firma Laboratories was engaged by Streetworks Pty Ltd as the geotechnical inspection and testing authority to provide Level 1 supervision and testing works on the earthworks component for Summerhill Estate Stage 5 Lot 513. This work was conducted over the period of 27/03/2018 to 05/04/2018.

This report presents that the allotment earthworks was carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development and in compliance with the compaction control specifications established by the contractor.

2 Scope of Works

2.1 Areas of work

The areas of work included lots 502 through to 518. The site will be a residential estate.

The area on which fill was placed is shown on site plan (Appendix 1 as shown in the level one report for the entire stage) based on drawings prepared by GPR Consulting and provided by Streetworks Pty Ltd.

The supervision work by Terra Firma Laboratories involved both inspection of sub grade preparation work and full time inspection and testing of fill placement.

2.2 Specification

The placement of fill on the areas of work was to be carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development, as directed by Streetworks Pty Ltd. At all times during placement of fill materials Terra Firma Laboratories maintained a Geotechnical Technician on site to perform the supervision and testing as required by AS3798-2007.

A technical specification for compaction control requirements was provided by Streetworks Pty Ltd and established that:

As referenced from AS3798-2007 (Section 5.2) establishes a specification requirement for a minimum density ratio of not less than 95% noting that soils containing more than 20% of particles coarser than 37.5mm cannot be tested for relative compaction using the procedures of AS1289.

Field density testing shall be undertaken at a frequency of not less than 3 tests per visit.

Test Rolling is required for all layers of structural fill and materials within 150mm of permanent subgrade level so as to withstand test rolling without visible deformation or springing. Corrective action is required where unstable areas exceed 20% of the area being considered by test rolling.

3 Inspection and Testing

3.1 Sub-Grade Preparation

Subgrade preparation involved stripping the site down of topsoil and organic matter to a depth of approximately 200mm below existing levels detailed on the site plans. The sub-grade area was then proof-rolled to determine soft or otherwise unsuitable zones and such zones rectified as necessary. The sub-grade was watered and scarified prior to fill placement to aid layer bonding.

3.2 Fill materials

The materials used as fill were locally sourced and observed to generally consist of Silty Clay, sourced from stockpiled materials on site. No particles greater than 150mm were observed. The fill was nominated as clean fill by the contractor.

3.3 Fill Construction

The contractor had the following plant available on-site during the construction period for use in the fill placement:

- Compactor
- Scraper
- Trucks
- Dozer
- Excavator
- Water Cart

All fill was placed in layers of thicknesses not exceeding 300mm. The work area was typically a 2 or 3 lot area on any one particular day. At the completion of a placed layer, compaction testing was performed to confirm appropriate compaction had been achieved and supported the observations made.

It was observed that finished levels were in accordance with levels marked on site by survey. These levels are shown on site plans attached in Appendix 1 as shown in the level one report for the entire stage.

The final 300mm of fill placed across the site was placed as a topsoil layer/ growing medium and should be considered as non-structural, as it was placed in an uncontrolled manner, as allowed by specifications.

4 Compaction Control Testing

Testing comprised of a total of 17 in-situ density tests, with a summary of results included in Appendix 2 as shown in the level one report for the entire stage. Test Reports are referenced in Appendix 3 as shown in the level one report for the entire stage.

It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. Each lot does not necessarily require a compaction test to comply. The compaction control testing indicated that the engineered fill on all lots complied with the technical specification.

5 Uncontrolled Works

Terra Firma Laboratories cannot verify any works completed by others after the final date specified in the introduction. Uncontrolled works may include, but not limited to trenching for services, cut and fill works for slab preparation or subsequent removal of vegetation and back fill of holes.

6 Clean Fill

Terra Firma Laboratories cannot guarantee that the material used as a filling medium is free from chemical or other contamination.

7 Statement of Compliance

Inspections and testing of the fill areas at this site indicate that both sub grade preparation and fill placement have been conducted in accordance with the specification and that the completed fill areas of greater than 300mm, as shown on the site plan attached, and not any preceding the 27/03/2018 or work completed after the 05/04/2018, may be certified as being compliant with the specification.

For and on behalf of
Terra Firma Laboratories,



Tom Seymour
Managing Director



Your Worksite is Our Laboratory.

**Geotechnical Report
Level One Inspection and Testing
Individual Lot Report**

**Summerhill Estate Stage 5
Cranbourne South
Lot 514**

Prepared for:

The Land Owner

Project 10194

22 August 2018

Prepared by:

TERRA FIRMA LABORATORIES
Geotechnical Inspection and Testing Authority

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Geotechnical Report Level One Inspection and Testing Summerhill Estate Stage 5 Lot 514

1 Introduction

Terra Firma Laboratories was engaged by Streetworks Pty Ltd as the geotechnical inspection and testing authority to provide Level 1 supervision and testing works on the earthworks component for Summerhill Estate Stage 5 Lot 514. This work was conducted over the period of 27/03/2018 to 05/04/2018.

This report presents that the allotment earthworks was carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development and in compliance with the compaction control specifications established by the contractor.

2 Scope of Works

2.1 Areas of work

The areas of work included lots 502 through to 518. The site will be a residential estate.

The area on which fill was placed is shown on site plan (Appendix 1 as shown in the level one report for the entire stage) based on drawings prepared by GPR Consulting and provided by Streetworks Pty Ltd.

The supervision work by Terra Firma Laboratories involved both inspection of sub grade preparation work and full time inspection and testing of fill placement.

2.2 Specification

The placement of fill on the areas of work was to be carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development, as directed by Streetworks Pty Ltd. At all times during placement of fill materials Terra Firma Laboratories maintained a Geotechnical Technician on site to perform the supervision and testing as required by AS3798-2007.

A technical specification for compaction control requirements was provided by Streetworks Pty Ltd and established that:

As referenced from AS3798-2007 (Section 5.2) establishes a specification requirement for a minimum density ratio of not less than 95% noting that soils containing more than 20% of particles coarser than 37.5mm cannot be tested for relative compaction using the procedures of AS1289.

Field density testing shall be undertaken at a frequency of not less than 3 tests per visit.

Test Rolling is required for all layers of structural fill and materials within 150mm of permanent subgrade level so as to withstand test rolling without visible deformation or springing. Corrective action is required where unstable areas exceed 20% of the area being considered by test rolling.

3 Inspection and Testing

3.1 Sub-Grade Preparation

Subgrade preparation involved stripping the site down of topsoil and organic matter to a depth of approximately 200mm below existing levels detailed on the site plans. The sub-grade area was then proof-rolled to determine soft or otherwise unsuitable zones and such zones rectified as necessary. The sub-grade was watered and scarified prior to fill placement to aid layer bonding.

3.2 Fill materials

The materials used as fill were locally sourced and observed to generally consist of Silty Clay, sourced from stockpiled materials on site. No particles greater than 150mm were observed. The fill was nominated as clean fill by the contractor.

3.3 Fill Construction

The contractor had the following plant available on-site during the construction period for use in the fill placement:

- Compactor
- Scraper
- Trucks
- Dozer
- Excavator
- Water Cart

All fill was placed in layers of thicknesses not exceeding 300mm. The work area was typically a 2 or 3 lot area on any one particular day. At the completion of a placed layer, compaction testing was performed to confirm appropriate compaction had been achieved and supported the observations made.

It was observed that finished levels were in accordance with levels marked on site by survey. These levels are shown on site plans attached in Appendix 1 as shown in the level one report for the entire stage.

The final 300mm of fill placed across the site was placed as a topsoil layer/ growing medium and should be considered as non-structural, as it was placed in an uncontrolled manner, as allowed by specifications.

4 Compaction Control Testing

Testing comprised of a total of 17 in-situ density tests, with a summary of results included in Appendix 2 as shown in the level one report for the entire stage. Test Reports are referenced in Appendix 3 as shown in the level one report for the entire stage.

It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. Each lot does not necessarily require a compaction test to comply. The compaction control testing indicated that the engineered fill on all lots complied with the technical specification.

5 Uncontrolled Works

Terra Firma Laboratories cannot verify any works completed by others after the final date specified in the introduction. Uncontrolled works may include, but not limited to trenching for services, cut and fill works for slab preparation or subsequent removal of vegetation and back fill of holes.

6 Clean Fill

Terra Firma Laboratories cannot guarantee that the material used as a filling medium is free from chemical or other contamination.

7 Statement of Compliance

Inspections and testing of the fill areas at this site indicate that both sub grade preparation and fill placement have been conducted in accordance with the specification and that the completed fill areas of greater than 300mm, as shown on the site plan attached, and not any preceding the 27/03/2018 or work completed after the 05/04/2018, may be certified as being compliant with the specification.

For and on behalf of
Terra Firma Laboratories,



Tom Seymour
Managing Director

**Geotechnical Report
Level One Inspection and Testing
Individual Lot Report**

**Summerhill Estate Stage 5
Cranbourne South
Lot 515**

Prepared for:

The Land Owner

Project 10194

22 August 2018

Prepared by:

TERRA FIRMA LABORATORIES
Geotechnical Inspection and Testing Authority

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Geotechnical Report Level One Inspection and Testing Summerhill Estate Stage 5 Lot 515

1 Introduction

Terra Firma Laboratories was engaged by Streetworks Pty Ltd as the geotechnical inspection and testing authority to provide Level 1 supervision and testing works on the earthworks component for Summerhill Estate Stage 5 Lot 515. This work was conducted over the period of 27/03/2018 to 05/04/2018.

This report presents that the allotment earthworks was carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development and in compliance with the compaction control specifications established by the contractor.

2 Scope of Works

2.1 Areas of work

The areas of work included lots 502 through to 518. The site will be a residential estate.

The area on which fill was placed is shown on site plan (Appendix 1 as shown in the level one report for the entire stage) based on drawings prepared by GPR Consulting and provided by Streetworks Pty Ltd.

The supervision work by Terra Firma Laboratories involved both inspection of sub grade preparation work and full time inspection and testing of fill placement.

2.2 Specification

The placement of fill on the areas of work was to be carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development, as directed by Streetworks Pty Ltd. At all times during placement of fill materials Terra Firma Laboratories maintained a Geotechnical Technician on site to perform the supervision and testing as required by AS3798-2007.

A technical specification for compaction control requirements was provided by Streetworks Pty Ltd and established that:

As referenced from AS3798-2007 (Section 5.2) establishes a specification requirement for a minimum density ratio of not less than 95% noting that soils containing more than 20% of particles coarser than 37.5mm cannot be tested for relative compaction using the procedures of AS1289.

Field density testing shall be undertaken at a frequency of not less than 3 tests per visit.

Test Rolling is required for all layers of structural fill and materials within 150mm of permanent subgrade level so as to withstand test rolling without visible deformation or springing. Corrective action is required where unstable areas exceed 20% of the area being considered by test rolling.

3 Inspection and Testing

3.1 Sub-Grade Preparation

Subgrade preparation involved stripping the site down of topsoil and organic matter to a depth of approximately 200mm below existing levels detailed on the site plans. The sub-grade area was then proof-rolled to determine soft or otherwise unsuitable zones and such zones rectified as necessary. The sub-grade was watered and scarified prior to fill placement to aid layer bonding.

3.2 Fill materials

The materials used as fill were locally sourced and observed to generally consist of Silty Clay, sourced from stockpiled materials on site. No particles greater than 150mm were observed. The fill was nominated as clean fill by the contractor.

3.3 Fill Construction

The contractor had the following plant available on-site during the construction period for use in the fill placement:

- Compactor
- Scraper
- Trucks
- Dozer
- Excavator
- Water Cart

All fill was placed in layers of thicknesses not exceeding 300mm. The work area was typically a 2 or 3 lot area on any one particular day. At the completion of a placed layer, compaction testing was performed to confirm appropriate compaction had been achieved and supported the observations made.

It was observed that finished levels were in accordance with levels marked on site by survey. These levels are shown on site plans attached in Appendix 1 as shown in the level one report for the entire stage.

The final 300mm of fill placed across the site was placed as a topsoil layer/ growing medium and should be considered as non-structural, as it was placed in an uncontrolled manner, as allowed by specifications.

4 Compaction Control Testing

Testing comprised of a total of 17 in-situ density tests, with a summary of results included in Appendix 2 as shown in the level one report for the entire stage. Test Reports are referenced in Appendix 3 as shown in the level one report for the entire stage.

It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. Each lot does not necessarily require a compaction test to comply. The compaction control testing indicated that the engineered fill on all lots complied with the technical specification.

5 Uncontrolled Works

Terra Firma Laboratories cannot verify any works completed by others after the final date specified in the introduction. Uncontrolled works may include, but not limited to trenching for services, cut and fill works for slab preparation or subsequent removal of vegetation and back fill of holes.

6 Clean Fill

Terra Firma Laboratories cannot guarantee that the material used as a filling medium is free from chemical or other contamination.

7 Statement of Compliance

Inspections and testing of the fill areas at this site indicate that both sub grade preparation and fill placement have been conducted in accordance with the specification and that the completed fill areas of greater than 300mm, as shown on the site plan attached, and not any preceding the 27/03/2018 or work completed after the 05/04/2018, may be certified as being compliant with the specification.

For and on behalf of
Terra Firma Laboratories,



Tom Seymour
Managing Director

**Geotechnical Report
Level One Inspection and Testing
Individual Lot Report**

**Summerhill Estate Stage 5
Cranbourne South
Lot 516**

Prepared for:

The Land Owner

Project 10194

22 August 2018

Prepared by:

TERRA FIRMA LABORATORIES
Geotechnical Inspection and Testing Authority

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Geotechnical Report Level One Inspection and Testing Summerhill Estate Stage 5 Lot 516

1 Introduction

Terra Firma Laboratories was engaged by Streetworks Pty Ltd as the geotechnical inspection and testing authority to provide Level 1 supervision and testing works on the earthworks component for Summerhill Estate Stage 5 Lot 516. This work was conducted over the period of 27/03/2018 to 05/04/2018.

This report presents that the allotment earthworks was carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development and in compliance with the compaction control specifications established by the contractor.

2 Scope of Works

2.1 Areas of work

The areas of work included lots 502 through to 518. The site will be a residential estate.

The area on which fill was placed is shown on site plan (Appendix 1 as shown in the level one report for the entire stage) based on drawings prepared by GPR Consulting and provided by Streetworks Pty Ltd.

The supervision work by Terra Firma Laboratories involved both inspection of sub grade preparation work and full time inspection and testing of fill placement.

2.2 Specification

The placement of fill on the areas of work was to be carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development, as directed by Streetworks Pty Ltd. At all times during placement of fill materials Terra Firma Laboratories maintained a Geotechnical Technician on site to perform the supervision and testing as required by AS3798-2007.

A technical specification for compaction control requirements was provided by Streetworks Pty Ltd and established that:

As referenced from AS3798-2007 (Section 5.2) establishes a specification requirement for a minimum density ratio of not less than 95% noting that soils containing more than 20% of particles coarser than 37.5mm cannot be tested for relative compaction using the procedures of AS1289.

Field density testing shall be undertaken at a frequency of not less than 3 tests per visit.

Test Rolling is required for all layers of structural fill and materials within 150mm of permanent subgrade level so as to withstand test rolling without visible deformation or springing. Corrective action is required where unstable areas exceed 20% of the area being considered by test rolling.

3 Inspection and Testing

3.1 Sub-Grade Preparation

Subgrade preparation involved stripping the site down of topsoil and organic matter to a depth of approximately 200mm below existing levels detailed on the site plans. The sub-grade area was then proof-rolled to determine soft or otherwise unsuitable zones and such zones rectified as necessary. The sub-grade was watered and scarified prior to fill placement to aid layer bonding.

3.2 Fill materials

The materials used as fill were locally sourced and observed to generally consist of Silty Clay, sourced from stockpiled materials on site. No particles greater than 150mm were observed. The fill was nominated as clean fill by the contractor.

3.3 Fill Construction

The contractor had the following plant available on-site during the construction period for use in the fill placement:

- Compactor
- Scraper
- Trucks
- Dozer
- Excavator
- Water Cart

All fill was placed in layers of thicknesses not exceeding 300mm. The work area was typically a 2 or 3 lot area on any one particular day. At the completion of a placed layer, compaction testing was performed to confirm appropriate compaction had been achieved and supported the observations made.

It was observed that finished levels were in accordance with levels marked on site by survey. These levels are shown on site plans attached in Appendix 1 as shown in the level one report for the entire stage.

The final 300mm of fill placed across the site was placed as a topsoil layer/ growing medium and should be considered as non-structural, as it was placed in an uncontrolled manner, as allowed by specifications.

4 Compaction Control Testing

Testing comprised of a total of 17 in-situ density tests, with a summary of results included in Appendix 2 as shown in the level one report for the entire stage. Test Reports are referenced in Appendix 3 as shown in the level one report for the entire stage.

It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. Each lot does not necessarily require a compaction test to comply. The compaction control testing indicated that the engineered fill on all lots complied with the technical specification.

5 Uncontrolled Works

Terra Firma Laboratories cannot verify any works completed by others after the final date specified in the introduction. Uncontrolled works may include, but not limited to trenching for services, cut and fill works for slab preparation or subsequent removal of vegetation and back fill of holes.

6 Clean Fill

Terra Firma Laboratories cannot guarantee that the material used as a filling medium is free from chemical or other contamination.

7 Statement of Compliance

Inspections and testing of the fill areas at this site indicate that both sub grade preparation and fill placement have been conducted in accordance with the specification and that the completed fill areas of greater than 300mm, as shown on the site plan attached, and not any preceding the 27/03/2018 or work completed after the 05/04/2018, may be certified as being compliant with the specification.

For and on behalf of
Terra Firma Laboratories,



Tom Seymour
Managing Director

**Geotechnical Report
Level One Inspection and Testing
Individual Lot Report**

**Summerhill Estate Stage 5
Cranbourne South
Lot 517**

Prepared for:

The Land Owner

Project 10194

22 August 2018

Prepared by:

TERRA FIRMA LABORATORIES
Geotechnical Inspection and Testing Authority

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Geotechnical Report Level One Inspection and Testing Summerhill Estate Stage 5 Lot 517

1 Introduction

Terra Firma Laboratories was engaged by Streetworks Pty Ltd as the geotechnical inspection and testing authority to provide Level 1 supervision and testing works on the earthworks component for Summerhill Estate Stage 5 Lot 517. This work was conducted over the period of 27/03/2018 to 05/04/2018.

This report presents that the allotment earthworks was carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development and in compliance with the compaction control specifications established by the contractor.

2 Scope of Works

2.1 Areas of work

The areas of work included lots 502 through to 518. The site will be a residential estate.

The area on which fill was placed is shown on site plan (Appendix 1 as shown in the level one report for the entire stage) based on drawings prepared by GPR Consulting and provided by Streetworks Pty Ltd.

The supervision work by Terra Firma Laboratories involved both inspection of sub grade preparation work and full time inspection and testing of fill placement.

2.2 Specification

The placement of fill on the areas of work was to be carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development, as directed by Streetworks Pty Ltd. At all times during placement of fill materials Terra Firma Laboratories maintained a Geotechnical Technician on site to perform the supervision and testing as required by AS3798-2007.

A technical specification for compaction control requirements was provided by Streetworks Pty Ltd and established that:

As referenced from AS3798-2007 (Section 5.2) establishes a specification requirement for a minimum density ratio of not less than 95% noting that soils containing more than 20% of particles coarser than 37.5mm cannot be tested for relative compaction using the procedures of AS1289.

Field density testing shall be undertaken at a frequency of not less than 3 tests per visit.

Test Rolling is required for all layers of structural fill and materials within 150mm of permanent subgrade level so as to withstand test rolling without visible deformation or springing. Corrective action is required where unstable areas exceed 20% of the area being considered by test rolling.

3 Inspection and Testing

3.1 Sub-Grade Preparation

Subgrade preparation involved stripping the site down of topsoil and organic matter to a depth of approximately 200mm below existing levels detailed on the site plans. The sub-grade area was then proof-rolled to determine soft or otherwise unsuitable zones and such zones rectified as necessary. The sub-grade was watered and scarified prior to fill placement to aid layer bonding.

3.2 Fill materials

The materials used as fill were locally sourced and observed to generally consist of Silty Clay, sourced from stockpiled materials on site. No particles greater than 150mm were observed. The fill was nominated as clean fill by the contractor.

3.3 Fill Construction

The contractor had the following plant available on-site during the construction period for use in the fill placement:

- Compactor
- Scraper
- Trucks
- Dozer
- Excavator
- Water Cart

All fill was placed in layers of thicknesses not exceeding 300mm. The work area was typically a 2 or 3 lot area on any one particular day. At the completion of a placed layer, compaction testing was performed to confirm appropriate compaction had been achieved and supported the observations made.

It was observed that finished levels were in accordance with levels marked on site by survey. These levels are shown on site plans attached in Appendix 1 as shown in the level one report for the entire stage.

The final 300mm of fill placed across the site was placed as a topsoil layer/ growing medium and should be considered as non-structural, as it was placed in an uncontrolled manner, as allowed by specifications.

4 Compaction Control Testing

Testing comprised of a total of 17 in-situ density tests, with a summary of results included in Appendix 2 as shown in the level one report for the entire stage. Test Reports are referenced in Appendix 3 as shown in the level one report for the entire stage.

It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. Each lot does not necessarily require a compaction test to comply. The compaction control testing indicated that the engineered fill on all lots complied with the technical specification.

5 Uncontrolled Works

Terra Firma Laboratories cannot verify any works completed by others after the final date specified in the introduction. Uncontrolled works may include, but not limited to trenching for services, cut and fill works for slab preparation or subsequent removal of vegetation and back fill of holes.

6 Clean Fill

Terra Firma Laboratories cannot guarantee that the material used as a filling medium is free from chemical or other contamination.

7 Statement of Compliance

Inspections and testing of the fill areas at this site indicate that both sub grade preparation and fill placement have been conducted in accordance with the specification and that the completed fill areas of greater than 300mm, as shown on the site plan attached, and not any preceding the 27/03/2018 or work completed after the 05/04/2018, may be certified as being compliant with the specification.

For and on behalf of
Terra Firma Laboratories,



Tom Seymour
Managing Director

**Geotechnical Report
Level One Inspection and Testing
Individual Lot Report**

**Summerhill Estate Stage 5
Cranbourne South
Lot 518**

Prepared for:

The Land Owner

Project 10194

22 August 2018

Prepared by:

TERRA FIRMA LABORATORIES
Geotechnical Inspection and Testing Authority

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Geotechnical Report Level One Inspection and Testing Summerhill Estate Stage 5 Lot 518

1 Introduction

Terra Firma Laboratories was engaged by Streetworks Pty Ltd as the geotechnical inspection and testing authority to provide Level 1 supervision and testing works on the earthworks component for Summerhill Estate Stage 5 Lot 518. This work was conducted over the period of 27/03/2018 to 05/04/2018.

This report presents that the allotment earthworks was carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development and in compliance with the compaction control specifications established by the contractor.

2 Scope of Works

2.1 Areas of work

The areas of work included lots 502 through to 518. The site will be a residential estate.

The area on which fill was placed is shown on site plan (Appendix 1 as shown in the level one report for the entire stage) based on drawings prepared by GPR Consulting and provided by Streetworks Pty Ltd.

The supervision work by Terra Firma Laboratories involved both inspection of sub grade preparation work and full time inspection and testing of fill placement.

2.2 Specification

The placement of fill on the areas of work was to be carried out in accordance with AS3798-2007 Guidelines for Earthworks for Commercial and Residential Development, as directed by Streetworks Pty Ltd. At all times during placement of fill materials Terra Firma Laboratories maintained a Geotechnical Technician on site to perform the supervision and testing as required by AS3798-2007.

A technical specification for compaction control requirements was provided by Streetworks Pty Ltd and established that:

As referenced from AS3798-2007 (Section 5.2) establishes a specification requirement for a minimum density ratio of not less than 95% noting that soils containing more than 20% of particles coarser than 37.5mm cannot be tested for relative compaction using the procedures of AS1289.

Field density testing shall be undertaken at a frequency of not less than 3 tests per visit.

Test Rolling is required for all layers of structural fill and materials within 150mm of permanent subgrade level so as to withstand test rolling without visible deformation or springing. Corrective action is required where unstable areas exceed 20% of the area being considered by test rolling.

3 Inspection and Testing

3.1 Sub-Grade Preparation

Subgrade preparation involved stripping the site down of topsoil and organic matter to a depth of approximately 200mm below existing levels detailed on the site plans. The sub-grade area was then proof-rolled to determine soft or otherwise unsuitable zones and such zones rectified as necessary. The sub-grade was watered and scarified prior to fill placement to aid layer bonding.

3.2 Fill materials

The materials used as fill were locally sourced and observed to generally consist of Silty Clay, sourced from stockpiled materials on site. No particles greater than 150mm were observed. The fill was nominated as clean fill by the contractor.

3.3 Fill Construction

The contractor had the following plant available on-site during the construction period for use in the fill placement:

- Compactor
- Scraper
- Trucks
- Dozer
- Excavator
- Water Cart

All fill was placed in layers of thicknesses not exceeding 300mm. The work area was typically a 2 or 3 lot area on any one particular day. At the completion of a placed layer, compaction testing was performed to confirm appropriate compaction had been achieved and supported the observations made.

It was observed that finished levels were in accordance with levels marked on site by survey. These levels are shown on site plans attached in Appendix 1 as shown in the level one report for the entire stage.

The final 300mm of fill placed across the site was placed as a topsoil layer/ growing medium and should be considered as non-structural, as it was placed in an uncontrolled manner, as allowed by specifications.

4 Compaction Control Testing

Testing comprised of a total of 17 in-situ density tests, with a summary of results included in Appendix 2 as shown in the level one report for the entire stage. Test Reports are referenced in Appendix 3 as shown in the level one report for the entire stage.

It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. Each lot does not necessarily require a compaction test to comply. The compaction control testing indicated that the engineered fill on all lots complied with the technical specification.

5 Uncontrolled Works

Terra Firma Laboratories cannot verify any works completed by others after the final date specified in the introduction. Uncontrolled works may include, but not limited to trenching for services, cut and fill works for slab preparation or subsequent removal of vegetation and back fill of holes.

6 Clean Fill

Terra Firma Laboratories cannot guarantee that the material used as a filling medium is free from chemical or other contamination.

7 Statement of Compliance

Inspections and testing of the fill areas at this site indicate that both sub grade preparation and fill placement have been conducted in accordance with the specification and that the completed fill areas of greater than 300mm, as shown on the site plan attached, and not any preceding the 27/03/2018 or work completed after the 05/04/2018, may be certified as being compliant with the specification.

For and on behalf of
Terra Firma Laboratories,



Tom Seymour
Managing Director