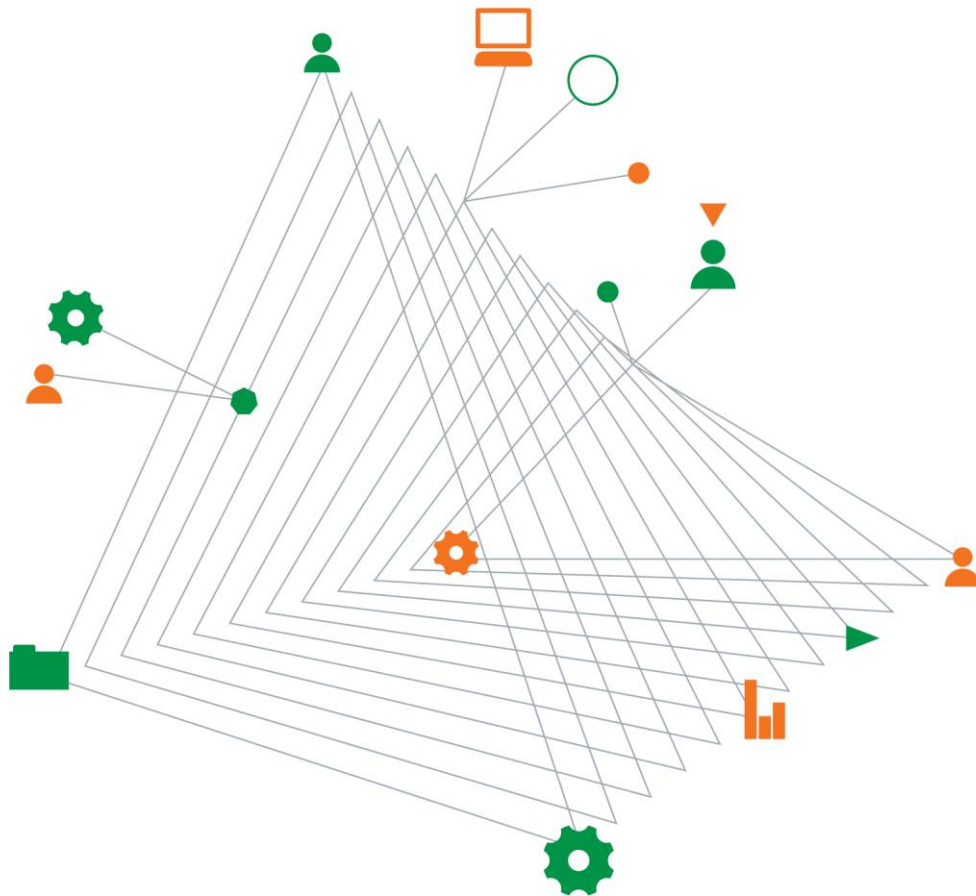


**Hugh Green Limited**

**Donegal Stud Residential Subdivision Stage 10B at  
84 Thomas Road, Flat Bush**

**Geotechnical Completion Report  
GENZAUCK16856AB**

9 August 2019



Experience  
comes to life  
when it is  
powered by  
expertise

## **Donegal Stud Stage 10B at 84 Thomas Road, Flat Bush**

Prepared for  
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C/- Harrison Grierson Consultants Limited  
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9 August 2019

Our Reference: GENZAUCK16856AB

### **RE: Geotechnical Completion Report for Residential Subdivision at Donegal Stud Stage 10B, 84 Thomas Road, Flat Bush**

This Geotechnical Completion Report presents all supporting geotechnical data, our Suitability Statement, and the Harrison Grierson Consultants Limited as-built plan set in relation to land development works recently completed at the above location.

It has been prepared in accordance with instructions received from Harrison Grierson Consultants Limited and forms part of the documentation required by Auckland Council to achieve certification under Section 224(c) of the Resource Management Act.

If you have any queries or you require any further clarification on any aspects of this report, please do not hesitate to contact the undersigned.

For and on behalf of Coffey

**Ray Berry**  
Associate Engineering Geologist

## Quality information

### Revision history

Revision	Description	Date	Author	Reviewer	Signatory
0	Draft	30/07/2019	JD/RB	PBCB	PBCB
1	Final	09/08/2019	JD/RB	PBCB	PBCB

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Appendix C - Field Density Test Summary Sheets

Appendix D - Existing Coffey Slope Stability Assessments

# 1. Introduction and Description of Subdivision

This Geotechnical Completion Report (GCR) has been prepared for Hugh Green Limited as part of the documentation required to be submitted to the Auckland Council following residential subdivisional development.

It contains our Suitability Statement, relevant test data, and the Harrison Grierson Consultants Limited (HGCL) as-built plan set relating to Stage 10B of the Donegal Stud Residential Subdivision as follows:

Table 1: Harrison Grierson Consultants Limited As-Built Plans

Title	Reference No.	Date
Finished Contours As-Built Plan	139718-10B1-AB200-Rev B	15 July 2019
Cut to Fill As-Built Plan	139718-10B1-AB220-Rev B	15 July 2019
Stormwater As-Built Plan	139718-10B1-AB400-Rev A	15 July 2019
Stormwater Details As-Built	139718-10B1-AB401-Rev A	15 July 2019
Wastewater As-Built Overall Plan	139718-10B1-AB405-Rev A	02 July 2019
Pavement As-Built Plan	139718-10B1-AB310-Rev B	15 July 2019
Raingarden Layout As-Built Plan	139718-10B1-AB410-Rev A	15 July 2019

This report covers the construction period late October 2017 to July 2019 and is intended to be used for certification purposes for:

- 61 residential lots numbered Lots 86 to 101 and Lots 103 to 147;
- The extension of Tir Conaill Avenue from boundary of 10A to the eastern site boundary;
- 1 new road named Drumnaconagher Drive;
- 1 new joint owned accessway named Glann Lane;
- 2 new Local Purpose (drainage) Reserves numbered Lots 407, 408; and;
- 1 new Recreation Reserve numbered Lot 406.

Stage 10B is located at 84 Thomas Road, Flat Bush, and as can be seen on the Cut to Fill as-built plan, most of the lots in Stage 10B have been partly or totally affected by filling to a maximum depth of approximately 2.5 metres.

## 2. Related Reports

Previous geotechnical reports prepared on the subject land by Coffey include:

- Geotechnical Investigation Report on Donegal Stud Stage 8 Residential Subdivision, reference GENZAUCK16403AA, dated 12 December 2014;
- Geotechnical Completion Report on Donegal Stud Stage 8, reference GENZAUCK16403AC, dated 6 December 2016

- Geotechnical Investigation Report on Proposed Donegal Stud Stage 10 Residential Subdivision, 62 Thomas Road, Flat Bush, reference GENZAUCK16856AB, dated 11 May 2017;
- Geotechnical Completion Report on Donegal Stud Stage 8, reference GENZAUCK16403AC, dated 6 December 2016;
- Slope Stability in Recreation Reserve (Lot 406), reference 16856AB, dated 2 April 2019;
- Slope Stability Assessment for Eastern and Western Boundary Gully Flanks, reference GENZAUCK16856AB, dated 16 April 2018; and,
- Geotechnical Completion Report on Donegal Stud Stage 10A Residential Subdivision, 84 Thomas Road, Flat Bush, reference GENZAUCK16856AB, dated 24 September 2018.

The conclusions and recommendations of the above documents (where relevant) have been referenced as part of the preparation of this report.

## **3. Earthworks Operations**

### **3.1. Plant**

The main items of plant used by the subdivision contractor, Dempsey Wood Civil Limited, included:

- 2 x Motor Scrapers;
- 5 x Bulldozers with Scoops;
- 1 x Bulldozer;
- 3 x Dump Trucks;
- 5 x Excavators;
- 1 x Tractor with Scoop;
- 1 x Tractor with Discs;
- 2 x Tractors;
- 2 x Front End Loaders;
- 1 x Water Truck;
- 2 x Sheep Foot Compactors;
- 1 x Pad Foot Compactor;
- 1 x Grader; and
- 2 x Vibrating Drum Rollers.

### **3.2. Construction Programme**

Earthworks construction on Stage 10B commenced in mid-November 2017. The Earthworks were conducted in conjunction with works required to develop Stage 10A. Initially, the earthworks focussed

on the infilling of the tributary gully systems through Stage 10A. The works in Stage 10B involved relatively minor cuts and fills to re-contour the land and to form roads and accessways.

By early March 2018 bulk earthworks operations had advanced towards the eastern extent of Stage 10B. During this phase of work, weak and wet to saturated soils were encountered. These soils were encountered while conducting earthworks to form the section of Drumnaconagher Drive that is located between Lot 406 and Lot 145. The weakened soils also extended further north and affected Lots 103, 122 and Lots 145 to 147. Due to the softening of the soils by groundwater, deep ruts formed in the surface materials from trafficking of heavy earthworking plant. This also prevented the compaction of fill to the required criteria.

To improve the ground conditions in this area, the affected soils within Lots 103 to 106 and Lots 145 to 147 were undercut to a depth of 1.5m below the design subgrade level. Less permeable material containing a higher clay contents were then placed and compacted over these lots.

The portion of affected accessway was also remediated by conducting a 300mm undercut and replacing the softened soils with black sand before forming the pavement. As an additional precaution a groundwater cut off drain was installed along the northern boundary of Lot 408. The drain is designed to intercept groundwater flows originating further up slope and discharge them to the stream beyond the eastern boundary. This was installed as a temporary measure to prevent groundwater from continuing to saturate the soils further downslope.

Subdivisional works for the 2018/2019 construction season commenced in October 2018. These works were undertaken to install site services, construct internal roads and accessways and to stabilise the gully slopes in Lot 407 and Lot 408. By late November 2018 the construction of a shear key in Lot 407 had started. The initial works focussed on defining the location of the shear key followed by the stripping of scrub and topsoil from the shear key and fill area. A track was then cut diagonally into the gully flank from the crest of the slope so excavators, dump trucks and compaction equipment could access the shear key excavation safely.

Once the shear key enabling works were complete, all existing weak subsoils in the shear key footprint were removed until dark grey Waitemata Group sandstone bedrock was exposed in the base of the excavation. The base of the key was then sunk at least 0.5m into the sandstone rock and graded with a 2% backfall into the slope. On completion, the shear key excavation was approximately 4m wide, 10 to 15m long and 1.5 to 2.5m deep.

Soft Pit Run Rock (SPR) was then placed and compacted in 200 to 300mm thick layers until the shear key excavation was backfilled to the original pre-construction ground level. The materials were placed in the shear key excavation under Engineering observation and compaction was confirmed by conducting proof roll tests with a loaded dump truck.

Installation of the underfill drain commenced as the backfilling of the shear key neared completion. A 2 to 3m deep trench was then cut into the flank of the gully extending above the shear key (towards Drumnaconagher Drive). Once formed, a 160mm diameter perforated drain coil was placed in the base of the trench and then surrounded with drainage metal and wrapped in geotextile cloth. To re-contour the gully flank in this area, the slope above the shear key was benched and landscape fill was placed (to a lower compaction standard) over the shear key and gully flank (above the key).

Construction and backfilling of the shear key area was mostly complete by early March 2019. Earthworks beyond the shear key involved dis-establishing the access track and then re-shaping the ground profile within the road reserve at the crest of the slope. As the shear key works neared completion, earthworks to re-grade the gully flank extending south of the shear key commenced. Once complete, the gully flank was then covered with topsoil and grassed.

The final work to stabilise the eastern gully flanks was undertaken in April 2019. This work was conducted in Lot 407, beyond the eastern boundary of Lot 406 (Recreation Reserve). This work included the removal of uncontrolled fill placed at the crest of the slope followed by re-shaping of the slope from the toe to the crest to form a uniform slope gradient. As discussed below, this work was conducted to provide short term stability to the slope immediately adjacent to the eastern boundary

of Lot 406 until earthworks associated with the widening and upgrading of Thomas Road are undertaken.

## 4. Quality Assurance and Controls

### 4.1. Inspections

During the earthworks operation engineering inspections were undertaken on a regular basis to assess compliance with NZS 4431 and our project specific recommendations and specifications. Project specific inspections were required on Stage 10B for:

- Topsoil stripping;
- Undercuts to remove soft and/or unsuitable material and to confirm that adequate strength base materials had been exposed;
- Placement of cut off drain;
- Shear key and underfill drain construction;
- Re-grading of the slopes along eastern boundary; and
- Observation of bulk cut to fill operations.

### 4.2. Quality Control Criteria

#### 4.2.1. Compaction

Due to the varying soil types being used as filling, the compaction control criteria of minimum allowable shear strength and maximum allowable air voids were mainly used for quality assurance purposes.

Specification details were as follows:

#### Minimum Shear Strength and Maximum Air Voids Method

Table 2: Minimum Shear Strength and Maximum Air Voids Method - General Fill

(a)	<u>Air Voids Percentage</u>	
	(As defined in NZS 4402)	
	General Fill	
	Average value less than	10%
	Maximum single value	12%
(b)	<u>Undrained Shear Strength</u>	
	(Measured by Pilcon shear vane - calibrated using NZGS 2001 method)	
	General fill	
	Average value not less than	140 kPa
	Minimum single value	120 kPa

Note: The average value shall be determined over any ten consecutive tests

Table 3: Minimum Shear Strength and Maximum Air Voids Method - Landscape Fill in Lot 406 (Recreation Reserve)

(b)	<u>Undrained Shear Strength</u>	
	(Measured by Pilcon shear vane - calibrated using NZGS 2001 method)	
	General fill	
	Average value not less than	80 kPa
	Minimum single value	70 kPa

Note: The average value shall be determined over any ten consecutive tests

## 4.3. Quality Assurance Testing

### 4.3.1. Compaction

Regular insitu density, strength and water content tests were carried out on all areas of the filling at or in excess of the frequency recommended by NZS 4431. Control tests carried out on the filling showed that on a few occasions the required compaction standards were not achieved. Results of these test failures were relayed to the site foreman and/or his staff, and to the best of our knowledge the affected areas of fill were re-worked as necessary. In each case, further testing was carried out until compliance with the above standards was achieved.

## 5. Project Evaluation

### 5.1. Bearing Capacity and Settlement of Building Foundations

Following the completion of earthworks operations, we returned to the site during June 2019 and drilled a series of hand auger boreholes at appropriate natural ground locations in order to evaluate likely foundation options for future residential building development. Typical topsoil depths on each lot were also assessed at this time.

Based on the findings our boreholes we have assessed that at current subgrade levels, all cut, filled and undisturbed natural ground has a geotechnical ultimate bearing capacity of 300 kPa within the zone of influence of conventional shallow residential building foundation loads.

It should be noted that NZS 3604 only allows a maximum backfill depth of 600mm over the building platform of a dwelling unless an Engineering design solution is proposed, on account of the risk of induced consolidation of the subsoils caused by the weight of the backfill.

### 5.2. Expansive Soils

Two sets of laboratory Expansive Soil Tests were carried out on samples selected from within the zone of likely influence of shallow building foundations in Stage 10B.

These tests were carried out in accordance with NZS 4402, "Methods of Testing Soils for Civil Engineering Purposes" test section 2 and were primarily intended to assess the Expansive Classes of the site materials as defined in AS 2870, "Residential Slabs and Footings – Construction".

All test results are IANZ (International Accreditation New Zealand) endorsed and full details are included in Appendix B.

The AS 2870 expansive site Class for Stage 10B is assessed to be M (moderate) and is based on the laboratory results together with our visual-tactile assessment and local knowledge. Specific design alternatives for this expansive site Class are presented in the following Suitability Statement.

### **5.3. Fill Induced Settlement**

As a result of our pre-fill inspections and quality control testing, we are of the opinion that induced differential settlements beneath or within the certified filling due to its imposed weight should be insignificant with respect to conventional NZS 3604 residential building developments.

### **5.4. Slope Stability**

#### **5.4.1. General**

Stability conditions along the gully flank within Lot 407 and Lot 408 (Drainage Reserves) have been enhanced by a range of engineering works, including:

#### **5.4.2. Shear Key in Lot 407**

As discussed above, an approximately 4m wide, 10 to 15m long by 1.5 - 2.5m deep shear key was constructed at the base of the slope in Lot 407 adjacent to the intersection of Tir Conaill Avenue and Drumnaconagher Drive. The shear key was installed at the base of a steep slope where slope stability analysis returned factors of safety that were below the required criteria.

#### **5.4.3. Re-Grading of Slopes in Lots 407 and 408**

The section of gully slope in Lots 407 extending south from the shear key towards Thomas Road was deemed potentially unstable at its pre-existing gradient. To improve the stability conditions here the slope was re-graded to a maximum angle of 18 degrees or 1(V):3(H).

A short section of the gully flank within in Lot 408 remains at a steeper angle. This has been assessed as being stable for the short term only. However, the area is subject to future earthworks that are required to widen Thomas Road. As part of these works the existing culvert /road crossing (including culvert outlet) will be upgraded and the long-term stability of the slopes in this area will be addressed at this time.

### **5.5. Lot Gradients**

The appended HGCL Finished Contour As-Built Plan shows Lot 407 and Lot 408 (Drainage Reserves) as having gradients steeper than 1 in 4. The extent of these areas has been determined by as-built site gradients. We are generally satisfied that these areas are not subject to the hazards described in Section 71(3) of the Building Act.

Details of resulting building and earthworks restrictions in the vicinity of these areas are presented in the Suitability Statement.

## **5.6. Land Drainage**

### **5.6.1. Underfill Drains**

During the development of Stage 10B a perforated underfill drain was placed in base of a 2 to 3m depth trench cut into the base of the gully extending west towards the intersection of Tir Conaill Avenue and Drumnaconagher Drive. The underfill drain was installed as part of the work required to construct the shear key in Lot 407.

This drain was intended to intercept localised groundwater seepages and springs exposed during earthworks and to help provide general control over groundwater levels, as required by NZS 4431. It is buried beneath 3 to 4m depth of Engineered fill. We do not foresee any construction issues related to this drain due to its location being well beyond any building platforms and / or accessways or service corridors.

### **5.6.2. Surface Cut Off Drain**

A surface cut off drain was installed along the northern boundary of Lot 408 (Drainage Reserve). The drain is designed to intercept overland floor/runout originating further upslope and to discharge it to the stream below. This drain was installed as a temporary measure to prevent groundwater from continuing to saturate the soils further downslope. In the long term it is expected that groundwater levels and associated flows will abate as the surrounding area is developed and built over.

## **5.7. Stormwater Controls**

It is important on all lots that due care is paid to the design and construction of appropriate stormwater disposal systems. These systems should serve to collect all runoff from roofs, driveways and paved areas, together with discharges from retaining wall drains and other subsoil drains and should connect directly into the public stormwater drainage network.

## **5.8. Service Trenches**

As is normal on all subdivisions, building developments involving foundations within the 45-degree zone of influence from pipe inverts will require engineering input. However, it is unlikely to be an issue for the Stage 10B lots based on the as-built plans provided.

## **5.9. Road Subgrades**

Dynamic Cone Penetrometer (DCP) testing was undertaken at regular intervals on the trimmed road subgrades and the results were subsequently forwarded to HGCL for pavement design purposes.

## **5.10. Vegetation Cover**

Wherever practical on sloping land beyond building platform areas, all existing grass cover should be maintained and even supplemented with new plantings. Any vegetation cleared beyond the immediate area of building platforms for temporary construction purposes should be replanted replaced as soon as possible.

The contribution of appropriate vegetation cover to sediment and erosion control should not be underestimated. This is particularly important in Lot 407 and Lot 408 (Drainage Reserves).



## 5.11. Topsoil

Topsoil depths in likely building platform areas were checked by the drilling of a shallow borehole probe in the approximate centre of each lot. Our findings, which are indicative only and subject to variation at other locations, show that topsoil depths are likely range between 100 mm and 400 mm.

The Contractor has been notified that there are locations within the lots that have excessive topsoil depths (i.e. greater than 300mm). In lieu of re-grading the lots to achieve compliant topsoil depths (150-300mm), Dempsey Wood have agreed to carry out the required remedial work should this become an issue during Building Consent and house construction.

## 5.12. Contractor's Work

We have relied on the Contractor's work practices and assume that the works have been carried out in accordance with:

- (i) The approved Contract drawings and design details,
- (ii) The approved Contract specifications,
- (iii) Authorised Variations issued during the execution of the works,
- (iv) The conditions of Resource, Earthworks and Building Consents where applicable,
- (v) The relevant Coffey Geotechnics reports, recommendations and site instructions,

and that all as-built information and other details provided to the Client and/or Coffey Geotechnics are accurate and correct in all respects.

## 6. Statement of Professional Opinion as to the Suitability of Land for Building Development

I, Chris Armstrong, of Coffey Geotechnics (NZ) Limited, Auckland, hereby confirm that:

1. I am a Chartered Professional Engineer experienced in the field of geotechnical engineering as defined in section 1.2.3 of NZS 4404 and was retained by the Developer as the Geotechnical Engineer on Stage 10B of the Donegal Stud residential subdivision, Flat Bush.
2. The extent of preliminary investigations carried out to date are described in the Coffey Geotechnical Investigation Report, reference GENZAUCK16856AB, dated 11 May 2017. The conclusions and recommendations of that document have been re-evaluated during the preparation of this report. Details of the results of all tests carried out are appended.
3. In my professional opinion, not to be construed as a guarantee, I consider that:
  - a. The earth fills shown on the appended Harrison Grierson Consultants Limited Cut to Fill As-Built Plan have been placed in compliance with NZS 4431 and related documents.
  - b. A geotechnical ultimate bearing capacity of 300 kPa may be assumed for shallow foundation design on all residential lots. Where a geotechnical bearing capacity greater than 300 kPa is required, (i.e. outside the limits of NZS 3604, such as when piling is undertaken), further specific site investigation and design of foundations should be carried out prior to building consent application.
  - c. The completed earthworks give due regard to land slope and foundation stability considerations within the residential lots and the Lot 406 (Recreation Reserve), but as shown

on the appended HGCL Finished Contours As-Built plan, areas within Lots 407 and 408 have gradients steeper than 1 in 4 or are adjacent to land having such gradients.

No building construction and no earthworks which increases the slope angle or surcharge loading should take place anywhere within the areas shown as steeper than 1 in 4 on these lots, or elsewhere if similar gradients exist, unless endorsed by a Chartered Professional Engineer experienced in geomechanics, as such operations may, in certain circumstances, have detrimental effects on overall site stability. Depending on the building design proposals this may require geotechnical investigations. As a minimum lateral loads from potential soil creep should be addressed in these areas if the landforms are to remain unmodified following building development.

- d. The backfilling and compaction of the stormwater and sanitary sewer trenches on this subdivision has where possible been carried out to appropriate standards having regard for the prevailing ground conditions and associated compaction induced pipe loadings.

Nevertheless, no building development should take place within the 45-degree zone of influence of drain inverts unless endorsed by specific site investigations, foundation designs and by construction inspections undertaken by a Chartered Professional Engineer experienced in geomechanics to ensure that lateral stability and differential settlement issues are addressed and that building loads are transferred beyond the influence of the pipe and the trench backfill.

- e. Although unlikely to be an issue, the function of the underfill drain in Lot 407 to the east of the intersection of Tir Conaill Avenue and Drumnaconagher Drive, and the surface cut-off drain within the road reserve of Drumnaconagher Drive must not be impaired by any future building development or landscaping works. In particular, any trenched services, bored or driven piles must be positioned to avoid damaging these drains. The presence of all such drains should be recorded on Council's Hazard Register.
- f. The assessed AS 2870:2011 expansive site Class for all residential lots in Stage 10B is M (moderate).
- g. Subject to the geotechnical recommendations and expansive soil assessment associated with 3(b), 3(c), 3(d), 3(e) and 3(f) above:
- (i) The cut, filled and original ground within residential lot boundaries is generally suitable for residential buildings constructed in accordance with NZS 3604 (that incorporates specific foundation and associated structural design on account of the expansive soils site Class) and related documents.
  - (ii) On all residential lots foundation design may be carried out in accordance with AS 2870:2011 (Class M) or alternatively, a specific foundation and structural design may be undertaken by a Chartered Professional Engineer who should allow for expansive soil effects in the design. The minimum recommended foundation depth below cleared ground level following topsoil removal and benching of building platform areas is 600mm for NZS3604 type strip and pad foundations.
4. Road subgrades have been formed having due regard for slope stability and settlement, although CBR values will likely vary between natural and filled ground as is to be expected.

## 7. Limitations

The as-built plans and the professional opinion contained within this report are furnished to Auckland Council and Hugh Green Limited for their purposes alone on the express condition that they will not be relied upon by any other person. Prospective purchasers should still satisfy themselves as to any specific conditions pertaining to their particular land interest.

The appended table summarises the status of each residential lot covered by this Suitability Statement.

For and on behalf of Coffey

Prepared By:



**Jade Dunne**  
Engineering Geologist



**Ray Berry**  
Associate Engineering Geologist

Reviewed and Authorised By:



Peter Bosselmann  
**Senior Principal**

Table 4: Suitability Statement Summary

Lot No.	Comments	Topsoil Depth (mm)	Ultimate Bearing (kPa)	AS2870:2011 Class
<b>86</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M
<b>87</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	250	300	M
<b>88</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	300	300	M
<b>89</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M
<b>90</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	250	300	M
<b>91</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	250	300	M
<b>92</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	300	300	M
<b>93</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	300	300	M
<b>94</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	250	300	M
<b>95</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	400	300	M
<b>96</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	250	300	M
<b>97</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	300	300	M
<b>98</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	250	300	M
<b>99</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M
<b>100</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M
<b>101</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	250	300	M
<b>103</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	250	300	M
<b>104</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M
<b>105</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M
<b>106</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M
<b>107</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	300	300	M
<b>108</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	250	300	M
<b>109</b>	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M

Lot No.	Comments	Topsoil Depth (mm)	Ultimate Bearing (kPa)	AS2870:2011 Class
110	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	250	300	M
111	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	300	300	M
112	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	300	300	M
113	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M
114	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	150	300	M
115	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	150	300	M
116	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	250	300	M
117	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M
118	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	100	300	M
119	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	300	300	M
120	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	250	300	M
121	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	300	300	M
122	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	300	300	M
123	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	300	300	M
124	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M
125	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M
126	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	150	300	M
127	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M
128	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M
129	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M
130	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	100	300	M
131	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	150	300	M
132	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	150	300	M

Lot No.	Comments	Topsoil Depth (mm)	Ultimate Bearing (kPa)	AS2870:2011 Class
133	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M
134	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M
135	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M
136	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	150	300	M
137	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	150	300	M
138	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M
139	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M
140	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M
141	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	250	300	M
142	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	200	300	M
143	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	300	300	M
144	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	300	300	M
145	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	300	300	M
146	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	300	300	M
147	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	300	300	M
406 (Recreation Reserve)	AS 2870 foundation design or NZS 3604 with minimum footing depth 600mm.	400	300	M



## Important information about your **Coffey** Report

As a client of Coffey you should know that site subsurface conditions cause more construction problems than any other factor. These notes have been prepared by Coffey to help you interpret and understand the limitations of your report.

### **Your report is based on project specific criteria**

---

Your report has been developed on the basis of your unique project specific requirements as understood by Coffey and applies only to the site investigated. Project criteria typically include the general nature of the project; its size and configuration; the location of any structures on the site; other site improvements; the presence of underground utilities; and the additional risk imposed by scope-of-service limitations imposed by the client. Your report should not be used if there are any changes to the project without first asking Coffey to assess how factors that changed subsequent to the date of the report affect the report's recommendations. Coffey cannot accept responsibility for problems that may occur due to changed factors if they are not consulted.

### **Subsurface conditions can change**

---

Subsurface conditions are created by natural processes and the activity of man. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions which existed at the time of subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult Coffey to be advised how time may have impacted on the project.

### **Interpretation of factual data**

---

Site assessment identifies actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from literature and external data source review, sampling and subsequent laboratory testing are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, owners should retain the services of Coffey through the development stage, to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

### **Your report will only give preliminary recommendations**

---

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered as the project develops. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Coffey cannot be held responsible for such misinterpretation.

### **Your report is prepared for specific purposes and persons**

---

To avoid misuse of the information contained in your report it is recommended that you confer with Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. Your report should not be applied to any project other than that originally specified at the time the report was issued.

### **Interpretation by other design professionals**

---

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Coffey to work with other project design professionals who are affected by the report. Have Coffey explain the report implications to design professionals affected by them and then review plans and specifications produced to see how they incorporate the report findings.



## Important information about your **Coffey** Report

### **Data should not be separated from the report\***

---

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These logs etc. should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

### **Geoenvironmental concerns are not at issue**

---

Your report is not likely to relate any findings, conclusions, or recommendations about the potential for hazardous materials existing at the site unless specifically required to do so by the client. Specialist equipment, techniques, and personnel are used to perform a geoenvironmental assessment. Contamination can create major health, safety and environmental risks. If you have no information about the potential for your site to be contaminated or create an environmental hazard, you are advised to contact Coffey for information relating to geoenvironmental issues.

### **Rely on Coffey for additional assistance**

---

Coffey is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to a project, from design to construction. It is common that not all approaches will be necessarily dealt with in your site assessment report due to concepts proposed at that time. As the project progresses through design towards construction, speak with Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

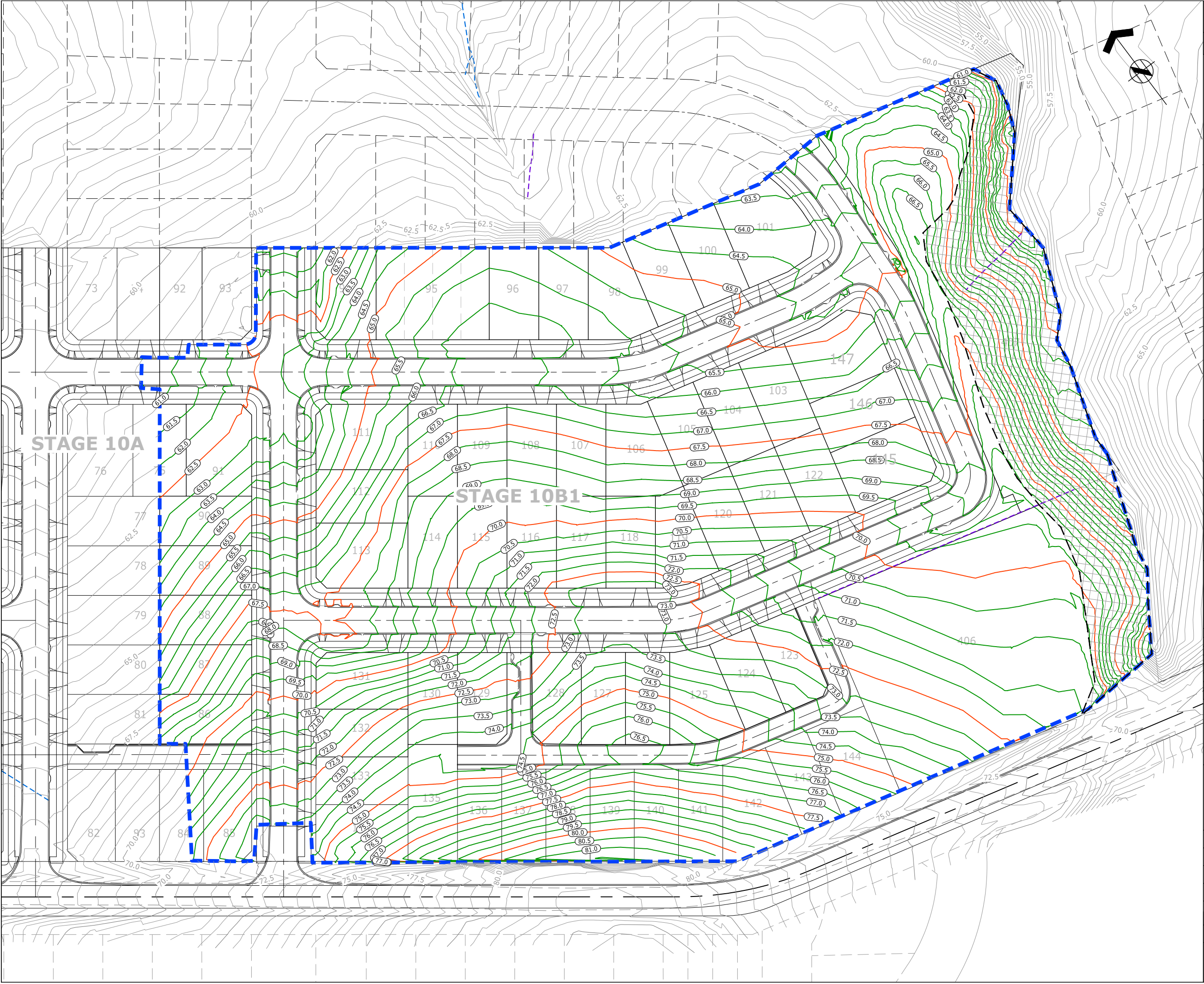
### **Responsibility**

---

Reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than the design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from Coffey to other parties but are included to identify where Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Coffey closely and do not hesitate to ask any questions you may have.



**Appendix A – Harrison Grierson Consultants  
Limited As-Built Plans**





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ENGINEERS NEW ZEALAND

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QUALITY  
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LIMITED. NO LIABILITY SHALL BE ACCEPTED FOR UNAUTHORISED USE OF THIS DRAWING.

NOTES:  
1. ORIGIN OF LEVELS  
S 66 SO 48643  
RL 54.50m  
2. ORIGIN OF COORDINATES  
S 66 SO 48643  
5905356.71mN  
1770941.22mE

LEGEND:  
--- STAGE BOUNDARY  
---(45.0)--- CONTOUR MAJOR  
---(44.5)--- CONTOUR MINOR  
--- EXISTING 3 x 1500 NOVAFLOW  
--- EXISTING 1500 NOVAFLOW  
--- 45.0 --- EXISTING CONTOUR MAJOR  
--- EXISTING CONTOUR MINOR  
--- EXTENT OF EARTHWORKS  
--- AREAS STEEPER THAN 1:4

ENGINEERING APPROVAL  
ENG-60310923

I CERTIFY THAT THESE ASBUILT PLANS ARE AN ACCURATE RECORD OF  
THE WORKS UNDERTAKEN AND THAT:  
• THE COORDINATES (X,Y) ARE IN TERMS OF NZTM ON NZGD  
(2000), AND ARE WITHIN ±50mm.  
• THE LEVELS (Z) ARE IN TERMS OF THE AUCKLAND 1946 (MSL)  
LINZ DATUM (DOSLI DATUM), AND ARE WITHIN ±25mm.

Signed:   
CHARTERED PROFESSIONAL ENGINEER  
Date: 15.07.19  
Name: WILLIAM JOHN FREDERICK PLATTS  
Phone: 09-917-5000  
Email: w.platts@harrisingrierson.com



AUCKLAND OFFICE  
LEVEL 4, 96 ST GEORGES BAY ROAD  
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W www.harrisingrierson.com

B	AS-BUILT	DXK	15.07.19
A	DRAFT AS-BUILT	DXK	09.07.19
REF	REVISIONS	BY	DATE

PROJECT:  
HUGH GREEN LIMITED  
DONEGAL STUD  
84 THOMAS ROAD, FLAT BUSH

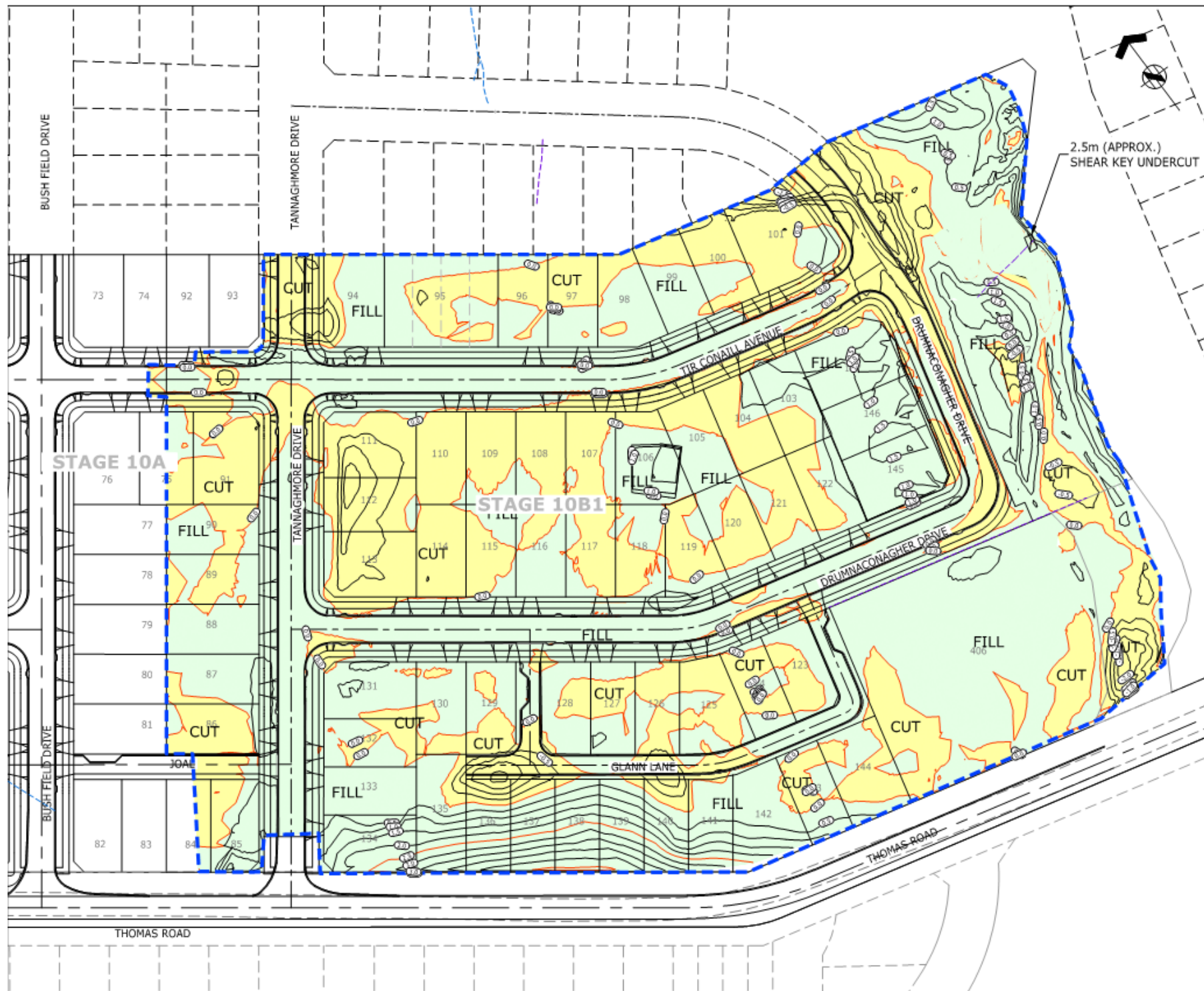
TITLE:  
FINISHED CONTOURS  
AS-BUILT PLAN

ORIGINATOR: DW	DATE: 04.2019	SIGNED:	PLOT BY: BKB
DRAWN: BB	DATE: 04.2019	SIGNED:	PLOT DATE: 17.07.19
CHECKED: SXX	DATE: 15.07.19	SIGNED:	SURVEY BY: DEMPSEY WOOD
APPROVED: WJP	DATE: 15.07.19	SIGNED:	SURVEY DATE: 04.2019

ISSUE STATUS:  
AS-BUILT

PROJECT No: 1050-139718-01	SCALES: 1:500-A1 1:1000-A3	A1
DRAWING No: 139718-10B1-AB200		REV B





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## NOTES:

1. ORIGIN OF LEVELS  
S 66 SO 48643  
RL 54.50m
2. ORIGIN OF COORDINATES  
S 66 SO 48643  
5905356.71mN  
1770941.22mE

LEGEND

- 

ENGINEERING APPROVAL  
ENG-60310923

I CERTIFY THAT THESE ASBUILT PLANS ARE AN ACCURATE RECORD OF THE WORKS UNDERTAKEN AND THAT:

- THE COORDINATES (X,Y) ARE IN TERMS OF NZTM ON NZGD (2000), AND ARE WITHIN ±50mm.
- THE LEVELS (Z) ARE IN TERMS OF THE AUCKLAND 1946 (MSL) LINE DATUM (DODS) DATUMS, AND ARE WITHIN ±25mm.

Signed:  CHARTERED PROFESSIONAL ENGINEER  
Date: 15.07.19  
Name: WILLIAM JOHN FREDERICK PLATTS  
Phone: 06-917-5000  
Email: w.platts@hambroglennison.com



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W [www.harboursight.com](http://www.harboursight.com)

B	45-BUILT	DOX	15.07.18
A	DRAFT AD-BUILT	DOX	19.11.17
REV	REVISIONS	BY	DATE

PROJECT:

HUGH GREEN LIMITED  
DONEGAL STUD  
84 THOMAS ROAD, FLAT BUSH

TITLE: CUT TO FILL  
AS-BUILT PLAN

DESIGNED:	DATE:	SIGNED:	PLD ID:
DW	04/2019		D000
DRAWN:	DATE:	SIGNED:	PLD DATE:
ED	04/2019		24.07.19
CHECKED:	DATE:	SIGNED:	SURVEY BY:
SDA	15.07.19		DEMPSEY WOOD
APPROVED:	DATE:	SIGNED:	SURVEY DATE:
WSP	15.07.19		04/2019

[illegible]

AS-BUILT

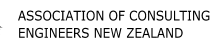
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1050-139718-01	1:1000-A3	
DRAWING No:		REV

139718-10B1-AB220

B

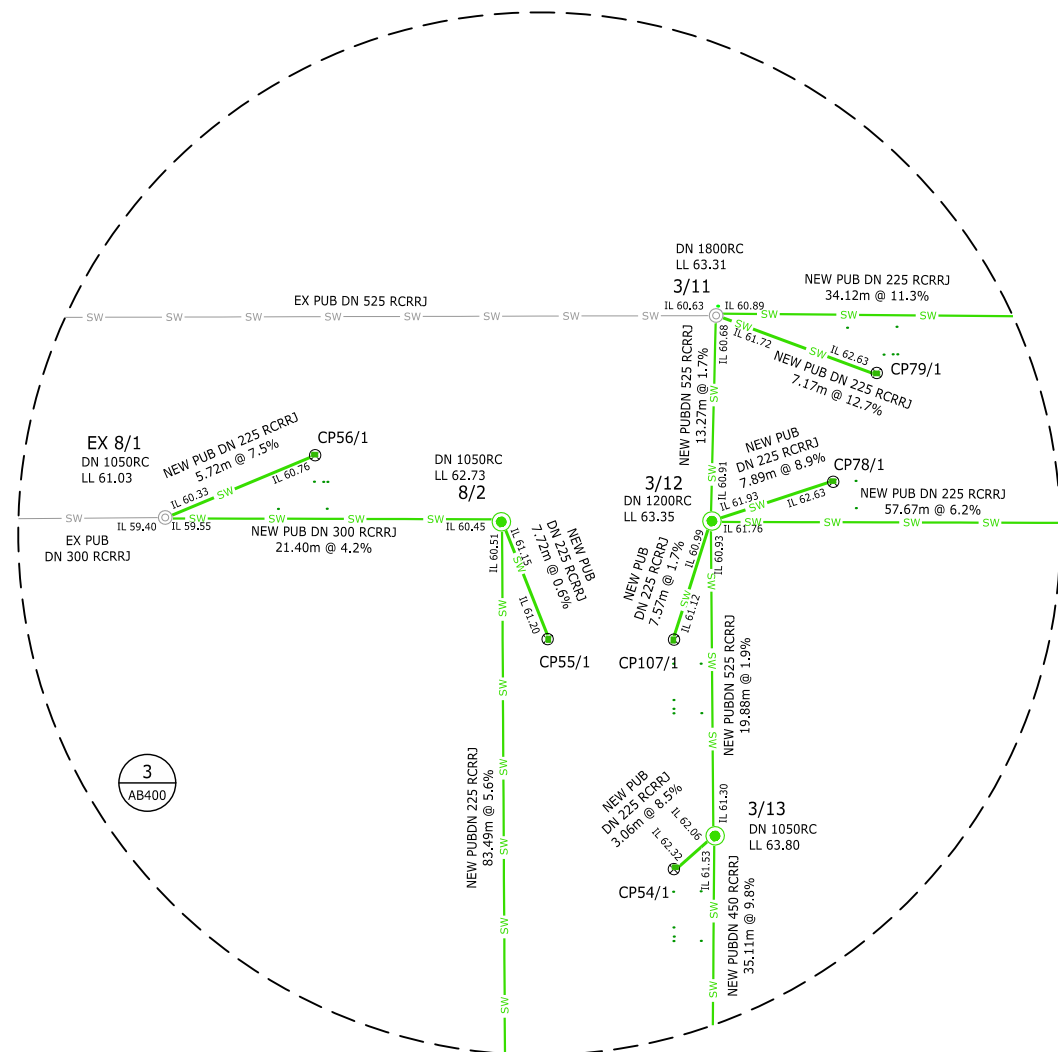
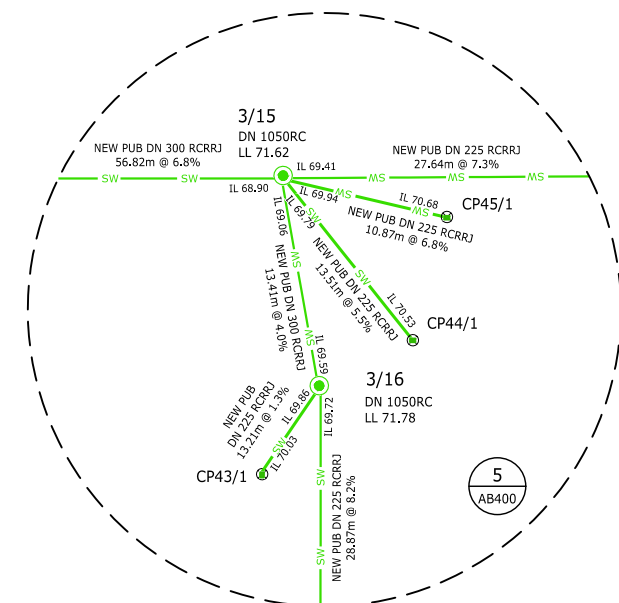
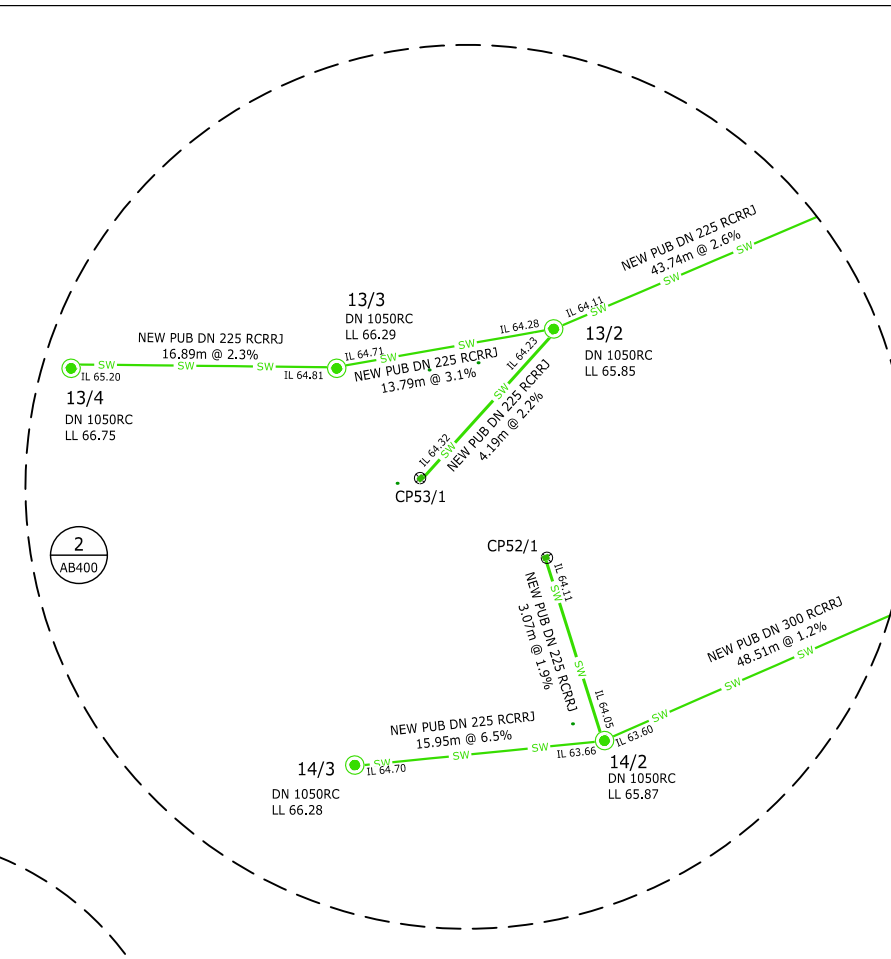






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ENGINEERING APPROVAL  
ENG-60310923

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- THE COORDINATES (X,Y) ARE IN TERMS OF NZTM ON NZGD (2000), AND ARE WITHIN  $\pm 50\text{mm}$ .
- THE LEVELS (Z) ARE IN TERMS OF THE AUCKLAND 1946 (MSL) LINZ DATUM (DOSLI DATUM), AND ARE WITHIN  $\pm 25\text{mm}$ .

Signed: .....  
**CHARTERED PROFESSIONAL ENGINEER**

Date: **15.07.19**

Name: WILLIAM JOHN FREDERICK PLATTS

Phone: 09-917-5000

Email: [w.platts@harrisingrierson.com](mailto:w.platts@harrisingrierson.com)



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PARNELL AUCKLAND 1052  
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W [www.harrisongrierson.com](http://www.harrisongrierson.com)

A	AS-BUILT	DXK	15.07.1
REF	REVISIONS	BY	DATE

REL	REV
PROJECT:	

HUGH GREEN LIMITED  
DONEGAL STUD  
84 THOMAS ROAD, FLAT BUSH

TITLE:

## STORMWATER DETAILS AS-BUILT

ORIGINATOR: DW	DATE: 04.2019	SIGNED:	PLOT BY: BK
DRAWN: BB	DATE: 04.2019	SIGNED:	PLOT DATE: 25.07.19
CHECKED: SXX	DATE: 15.07.19	SIGNED:	SURVEY BY: DEMPSEY WOOD
APPROVED: WJP	DATE: 15.07.19	SIGNED:	SURVEY DATE: 04.2019

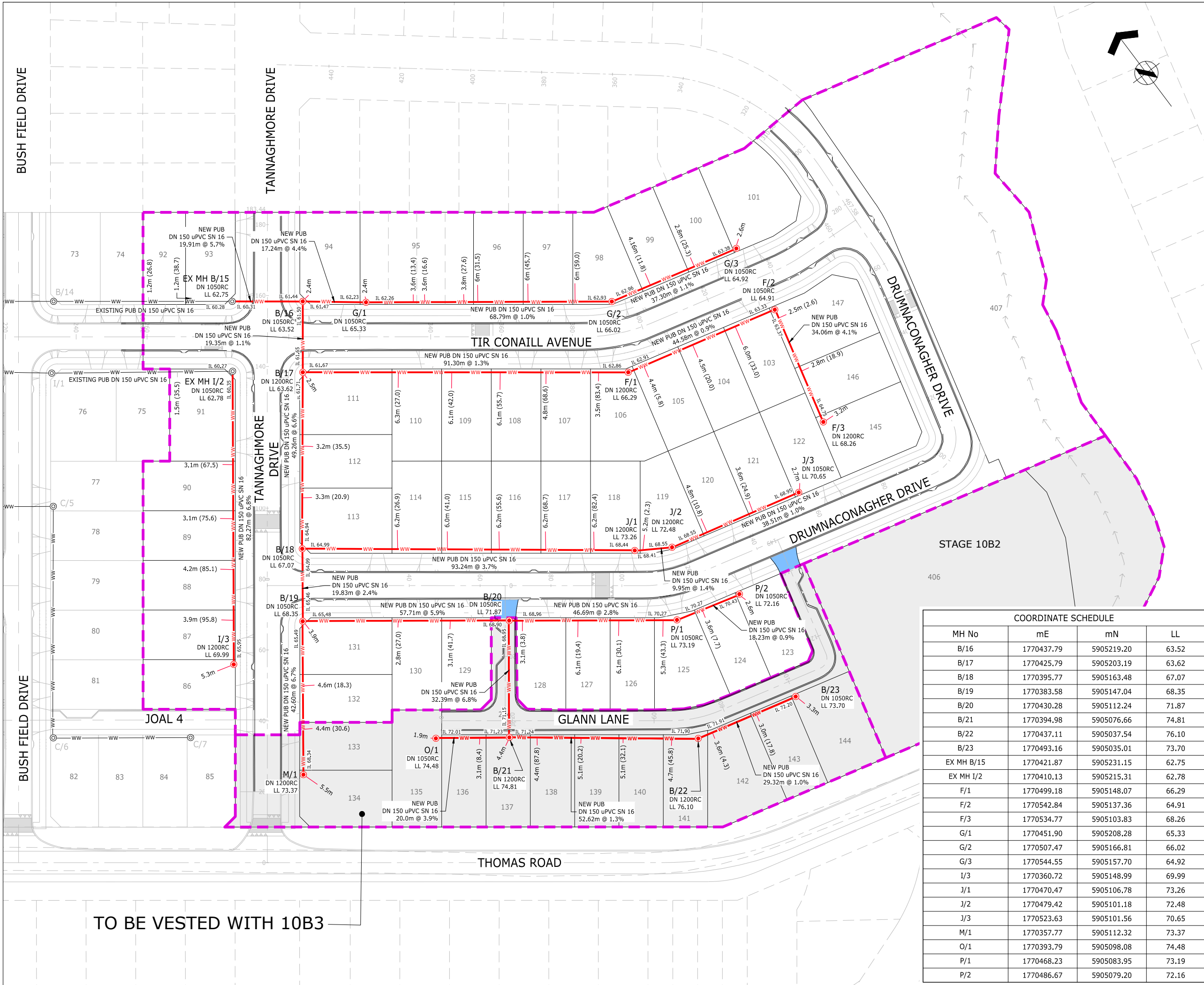
ISSUE STATUS:


AS-BUILT

PROJECT No: 1050-139718-01	SCALES: NOT TO SCALE	A1
DRAWING No:		REV

139718-10B1-AB401

A





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**NOTES:**

- ORIGIN OF LEVELS  
S 66 SO 48643  
RL 54.50m
- ORIGIN OF COORDINATES  
S 66 SO 48643  
5905356.71mN  
1770941.22mE
- ALL CONNECTIONS ARE DN 100 uPVC, CHAINAGE FOR CONNECTIONS ARE FROM DOWNSTREAM MANHOLE CENTRE.
- ALL WASTEWATER LINES ARE PVC-U SN16 UNLESS SHOWN OTHERWISE.
- ALL NEW MANHOLES ARE DN 1050 RC UNLESS SHOWN OTHERWISE.

**LEGEND**

- STAGE BOUNDARY
- NEW PUBLIC WASTEWATER LINE
- EXISTING PUBLIC WASTEWATER LINE
- NEW LOT CONNECTION
- NEW PUBLIC MANHOLE
- EXISTING PUBLIC MANHOLE

**ENGINEERING APPROVAL**  
ENG-60310923

I CERTIFY THAT THESE ASBUILT PLANS ARE AN ACCURATE RECORD OF THE WORKS UNDERTAKEN AND THAT:

- THE COORDINATES (X,Y) ARE IN TERMS OF NZTM ON NZGD (2000), AND ARE WITHIN ±50mm.
- THE LEVELS (Z) ARE IN TERMS OF THE AUCKLAND 1946 (MSL) LINZ DATUM (DOSLI DATUM), AND ARE WITHIN ±25mm.


Signed: *WJP*  
CHARTERED PROFESSIONAL ENGINEER

Date: **2.07.19**

Name: WILLIAM JOHN FREDERICK PLATTS

Phone: 09-917-5000

Email: w.platts@harringtongrierson.com



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REF	AS-BUILT	DXK	2.07.19
A	AS-BUILT	DXK	2.07.19
REF	REVISIONS	BY	DATE

PROJECT:

HUGH GREEN LIMITED  
DONEGAL STUD  
84 THOMAS ROAD, FLAT BUSH

TITLE:

WASTEWATER AS-BUILT  
OVERALL PLAN

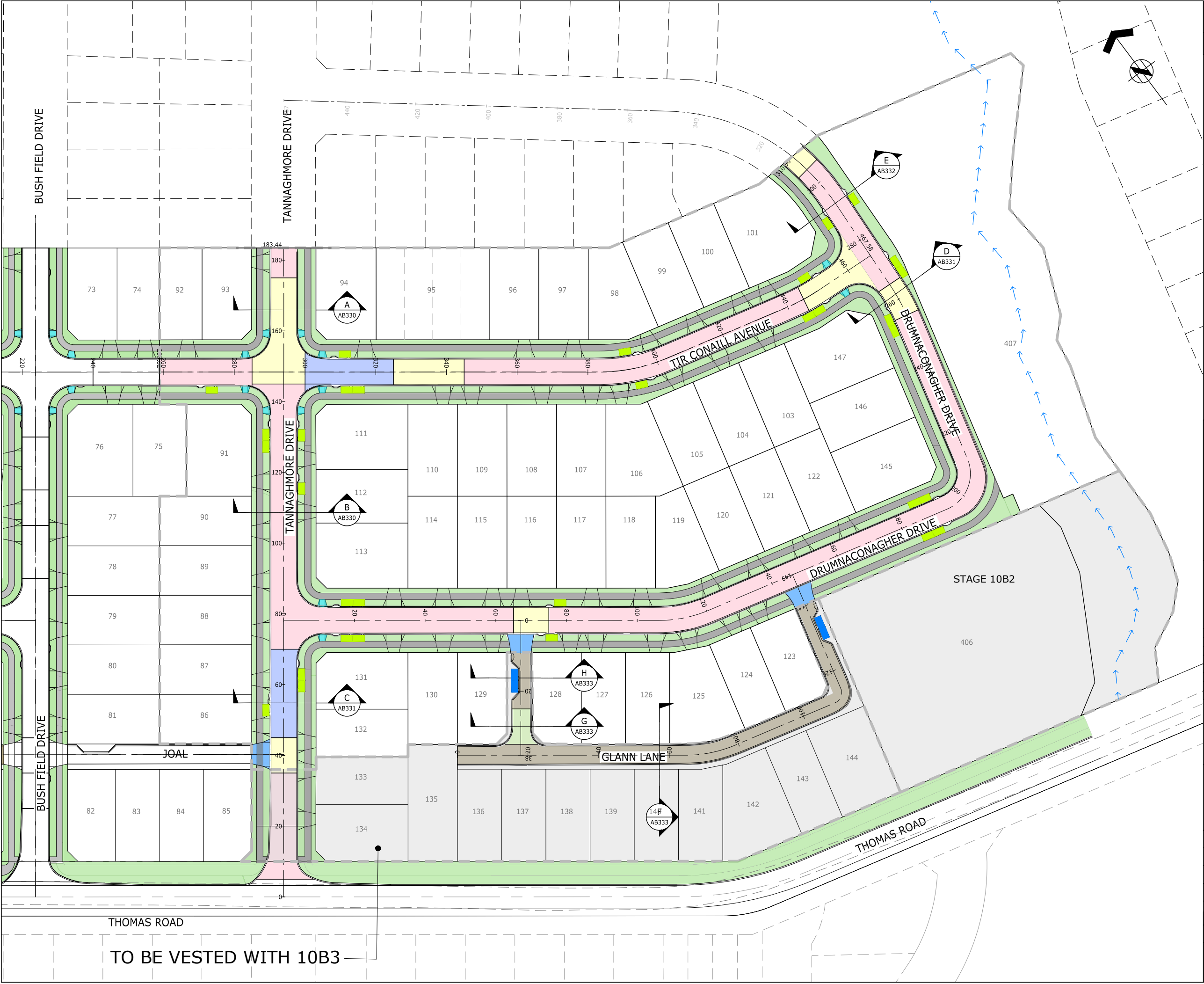
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DW	04.2019		DXK
DRAWN:	DATE:	SIGNED:	PLOT DATE:
AA, BB	06.2019		30.07.19
CHECKED:	DATE:	SIGNED:	SURVEY BY:
SXK	2.07.19		DEMPSEY WOOD
APPROVED:	DATE:	SIGNED:	SURVEY DATE:
WJP	2.07.19		04.2019

ISSUE STATUS:

AS-BUILT

PROJECT No:	SCALES:	A1
1050-139718-01	1:500-A1 1:1000-A3	A1
DRAWING No:	REV	
139718-10B1-AB405	A	

REFER TO APPROVED MASTER DRAWINGS FOR ORIGINAL SIGNATURES File: NEWMARKET N:\1050\139718\_A\CAD\AS-BUILTS\STAGE 10B\139718-10B1-AB405.DWG





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**NOTES:**

- ORIGIN OF LEVELS  
S 66 SO 48643  
RL 54.50m
- ORIGIN OF COORDINATES  
S 66 SO 48643  
5905356.71mN  
1770941.22mE
- ALL PAVEMENT COVERED IN 35mm HOTMIX (MIX 10)

**LEGEND:**

300mm BLACK SAND (UNDERCUT)  
200 AP 65 (SUBBASE)  
150mm AP 40 (BASE)

200 AP 65 (SUBBASE)  
150mm AP 40 (BASE)

300mm AP 65 (SUBBASE)  
100mm AP 40 (BASE)

100mm AP 65 (UNDERCUT)  
100mm AP 40 (BASE)

CONCRETE JOAL  
175mm (25 MPa) CONCRETE  
100mm AP 40 (BASE)

PRAM CROSSING

GRASS BERM

MANARC RESIDENTIAL VEHICLE CROSSING

RAINGARDEN PUBLIC

RAINGARDEN PRIVATE

ENGINEERING APPROVAL  
ENG-60310923

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- THE LEVELS (Z) ARE IN TERMS OF THE AUCKLAND 1946 (MSL) LINZ DATUM (DOSLI DATUM), AND ARE WITHIN ±25mm.

Signed:   
CHARTERED PROFESSIONAL ENGINEER

Date: **15.07.19**

Name: WILLIAM JOHN FREDERICK PLATTS

Phone: 09-917-5000

Email: w.platts@harrisonsgrimson.com



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PARNELL AUCKLAND 1052  
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W www.harrisonsgrimson.com

A	AS-BUILT	DXK	15.07.19
REF	REVISIONS	BY	DATE

PROJECT:

HUGH GREEN LIMITED  
DONEGAL STUD  
84 THOMAS ROAD, FLAT BUSH

TITLE:

PAVEMENT AS-BUILT PLAN

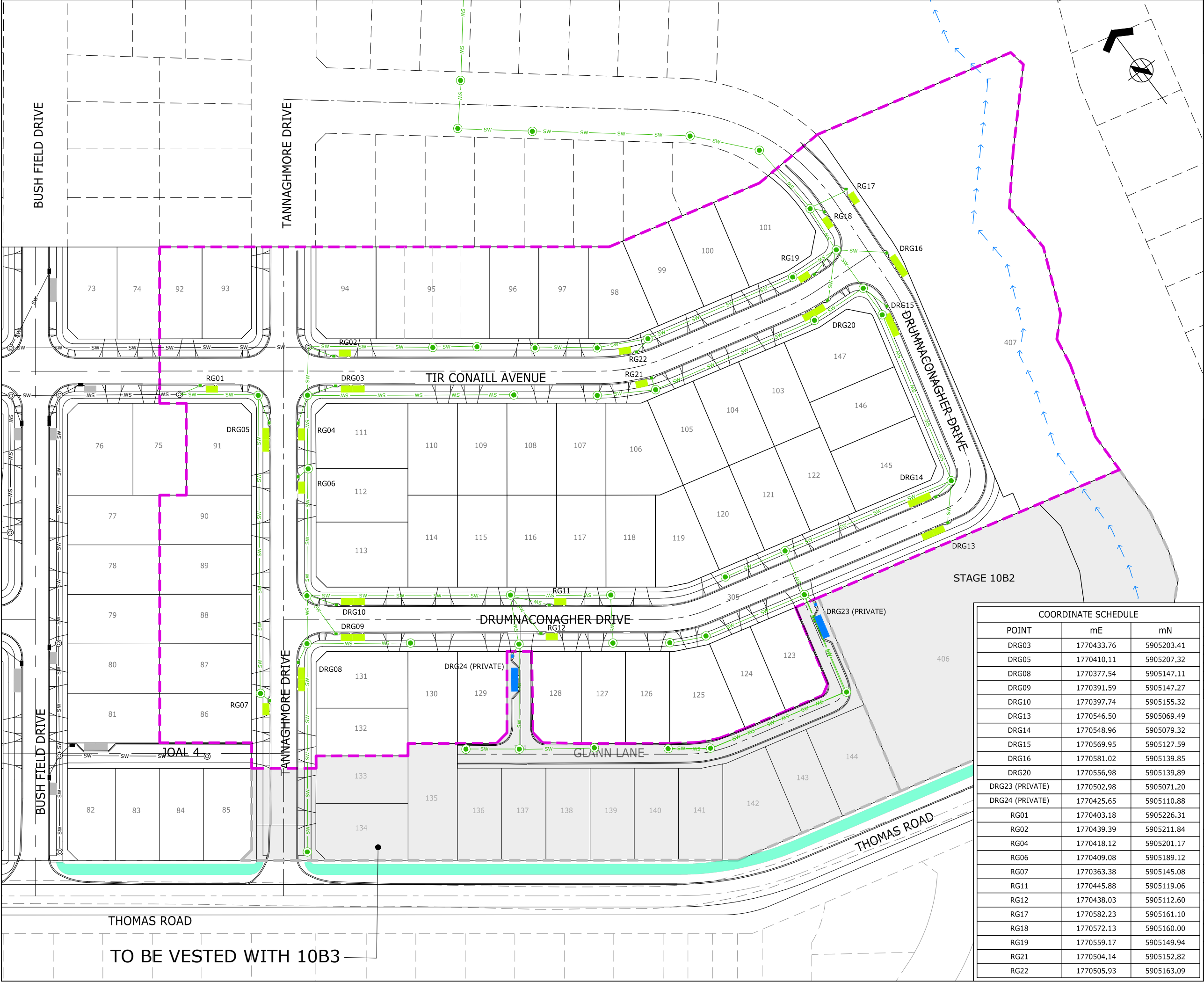
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DW	04.2019		BKB
DRAWN:	DATE:	SIGNED:	PLOT DATE:
BB	04.2019		16.07.19
CHECKED:	DATE:	SIGNED:	SURVEY BY:
SXK	15.07.19		DEMPSEY WOOD
APPROVED:	DATE:	SIGNED:	SURVEY DATE:
WJP	15.07.19		04.2019

ISSUE STATUS:

AS-BUILT

PROJECT No:	SCALES:	A1
1050-139718-01	1:500-A1 1:1000-A3	
DRAWING No:		REV
139718-10B1-AB310		A







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**NOTES:**

- ORIGIN OF LEVELS  
S 66 SO 48643  
RL 54.50m
- ORIGIN OF COORDINATES  
S 66 SO 48643  
5905356.71mN  
1770941.22mE

**LEGEND**

- STAGE BOUNDARY
- NEW PUBLIC STORMWATER LINE
- NEW PUBLIC RAINGARDEN
- NEW PPRIVATE RAINGARDEN
- NEW PUBLIC MANHOLE
- NEW PUBLIC CATCHPIT
- NEW PRIVATE CATCHPIT

**ENGINEERING APPROVAL**  
ENG-60310923

I CERTIFY THAT THESE ASBUILT PLANS ARE AN ACCURATE RECORD OF THE WORKS UNDERTAKEN AND THAT:

- THE COORDINATES (X,Y) ARE IN TERMS OF NZTM ON NZGD (2000), AND ARE WITHIN ±50mm.
- THE LEVELS (Z) ARE IN TERMS OF THE AUCKLAND 1946 (MSL) LINZ DATUM (DOSLI DATUM), AND ARE WITHIN ±25mm.

Signed: .....  
CHARTERED PROFESSIONAL ENGINEER

Date: **15.07.19**

Name: WILLIAM JOHN FREDERICK PLATTS

Phone: 09-917-5000

Email: w.platts@harrissongrierson.com



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REF	AS-BUILT	REVISIONS	DXK	15.07.19
A	AS-BUILT		DXK	15.07.19

PROJECT:

**HUGH GREEN LIMITED**  
**DONEGAL STUD**  
**84 THOMAS ROAD, FLAT BUSH**

TITLE:

**RAINGARDEN LAYOUT**  
**AS-BUILT PLAN**

ORIGINATOR: DW

DATE: 04.2019

SIGNED:

PLOT BY: BKB

DRAWN: BB

DATE: 04.2019

SIGNED:

PLOT DATE: 16.07.19

CHECKED: SKX

DATE: 15.07.19

SIGNED:

SURVEY BY: DEMPSEY WOOD

APPROVED: WJP

DATE: 15.07.19

SIGNED:

SURVEY DATE: 04.2019

ISSUE STATUS:

**AS-BUILT**

PROJECT No: 1050-139718-01

SCALES: 1:500-A1  
1:1000-A3

A1

DRAWING No:

**139718-10B1-AB410**

REV  
**A**



## **Appendix B – Classification Test Data**

## Atterberg Classification Test Report

**Report No: CLAS:ETAM19S-04878**

**Issue No:1**

This report replaces all previous issues of Report No. CLAS:ETAM19S-04878

**Client:** Coffey Services (NZ) Limited (Auckland)  
PO Box 8261, Symonds Street  
Auckland 1150

**Principal:** Jade Dunne

**Project No.:** 773-ETAM00525AA

**Project Name:** 773-GENZAUCK16856AB - Donegal Stage 10



Tests indicated as not accredited are outside the scope of the laboratory's accreditation.

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Approved Signatory: James McKelvey  
Senior Technician

IANZ Accredited Laboratory Number: 105

Date of Issue: 27/05/2019

### Sample Details

**Sample Number:** ETAM19S-04878 **Date Sampled:** 07/05/2019

**Project Location:** 84 Thomas Road, Flat Bush **Date Tested:** 25/05/2019

**Sample Location:** Lot 102, HA7, 0.4 - 0.8 m **Tested by:** James McKelvey

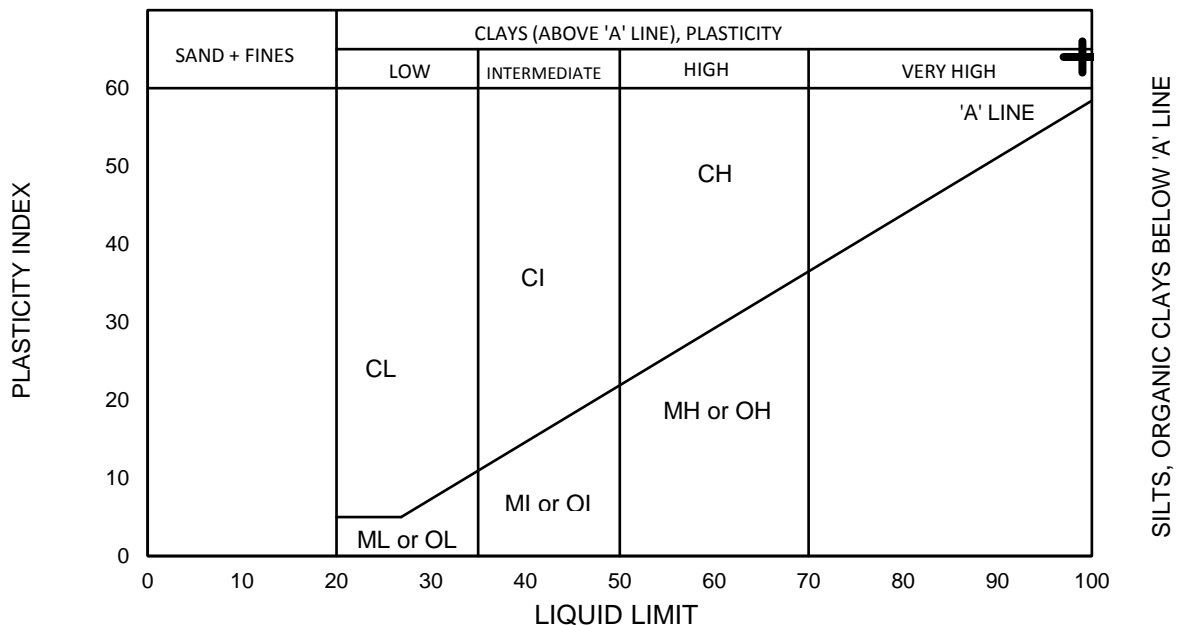
**Laboratory test Procedures:** Atterberg Limits [NZS 4402 Test 2.2, 2.3, 2.4, 2.6], Moisture Content [NZS 4402:1986 Test 2.1]

**Sampling Method:** Unknown (Not IANZ Endorsed)

### Laboratory Data

<b>Liquid Limit</b>	<b>99</b>	<b>Sample History:</b>	Natural state
<b>Plastic Limit:</b>	<b>35</b>	<b>Fraction Tested:</b>	Passing 425µm sieve
<b>Plasticity Index:</b>	<b>64</b>	<b>Material Description:</b>	Disturbed Soil
<b>Linear Shrinkage:</b>	<b>19</b>		
<b>#Liquidity Index (w-PL)/PI</b>	<b>0.0</b>	<b>Moisture Content (%)</b>	34.2

CASAGRANDE PLASTICITY CHART



### Comments:

## Atterberg Classification Test Report

**Report No: CLAS:ETAM19S-04879**

**Issue No:1**

This report replaces all previous issues of Report No. CLAS:ETAM19S-04879

**Client:** Coffey Services (NZ) Limited (Auckland)  
PO Box 8261, Symonds Street  
Auckland 1150


**Principal:** Jade Dunne


**Project No.:** 773-ETAM00525AA

**Project Name:** 773-GENZAUCK16856AB - Donegal Stage 10

Tests indicated as not accredited are outside the scope of the laboratory's accreditation.

{This document may not be altered or reproduced except in full. This report relates only to the positions tested.}





Approved Signatory: James McKelvey  
Senior Technician  
IANZ Accredited Laboratory Number: 105  
Date of Issue: 27/05/2019

### Sample Details

**Sample Number:** ETAM19S-04879 **Date Sampled:** 09/05/2019

**Project Location:** 84 Thomas Road, Flat Bush **Date Tested:** 25/05/2019

**Sample Location:** Lot 135, HA15, 0.4 - 0.8 m **Tested by:** James McKelvey

**Laboratory test Procedures:** Atterberg Limits [NZS 4402 Test 2.2, 2.3, 2.4, 2.6], Moisture Content [NZS 4402:1986 Test 2.1]

**Sampling Method:** Unknown (Not IANZ Endorsed)

### Laboratory Data

**Liquid Limit:** 74 **Sample History:** Natural state

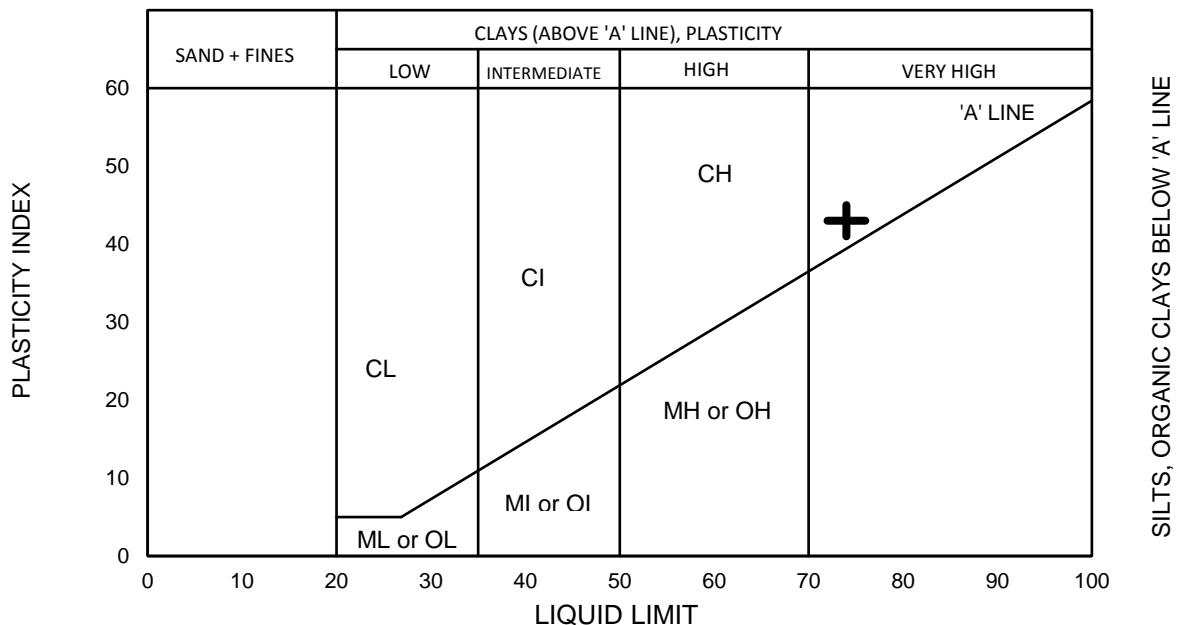
**Plastic Limit:** 31 **Fraction Tested:** Passing 425µm sieve

**Plasticity Index:** 43 **Material Description:** Disturbed Soil

**Linear Shrinkage:** 14


**#Liquidity Index (w-PL)/PI:** 0.0 **Moisture Content (%):** 31.3

CASAGRANDE PLASTICITY CHART



### Comments:

## **Appendix C - Field Density Test Summary**

<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center; justify-content: space-between;"> <div style="text-align: center;">  <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> </div> <div style="text-align: right;"> <p>Approved Signatory: Cesar Pura</p> <p>Issue date: 22/11/2017</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (t/m <sup>3</sup> )	Solid Density	Air Voids (%)
15/11/2017	17W03990	AB	1		Silty CLAY	Gully Undercut Backfill	1770230	5905432	-	150	~ 4.0m to Subgrade level	UTP	UTP	UTP	UTP	1.91	18.9	1.60	2.70	10.3
15/11/2017	17W03990	AB	2		Silty CLAY	Gully Undercut Backfill	1770238	5905419	-	150	~ 4.0m to Subgrade level	UTP	UTP	UTP	UTP	1.95	22.7	1.59	2.70	5.3

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM17W03990

**Page No:** 2 of 2



**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** Gully Undercut Backfill

**Tested by:** AB

**Date tested:** 15.11.17



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center; justify-content: space-between;"> <div style="text-align: center;">  <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> </div> <div style="text-align: right;">   <b>Approved Signatory:</b> Cesar Pura  <b>Issue date:</b> 24/11/2017         </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (t/m <sup>3</sup> )	Solid Density	Air Voids (%)
17/11/2017	17W04104	BS	3	Fill	Silty CLAY	Gully	1770233	5905427	-	150	~ 4.0m to Subgrade level	197	197	197	197	2.01	24.1	1.62	2.70	1.1
17/11/2017	17W04104	BS	4	Fill	Silty CLAY	Gully	1770243	5905403	-	150	~ 4.0m to Subgrade level	UTP	UTP	UTP	UTP	2.03	31.9	1.54	2.70	0.0



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM17W04104

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush



**Location:** Gully

**Tested by:** BS

**Date tested:** 17.11.17





<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center; justify-content: space-between; padding: 10px;"> <div style="text-align: center;">  <p><b>IANZ</b> ACCREDITED LABORATORY</p> </div> <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> </div> <div style="text-align: right;">   <p>Approved Signatory: Cesar Pura Issue date: 24/11/2017</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (t/m <sup>3</sup> )	Solid Density	Air Voids (%)
20/11/2017	ETAM17W04122	BS/DL	5	Fill	Silty CLAY	Gully	1770238	5905425	-	150	3.5m to Finished Level	197+	197+	197+	197+	1.99	19.9	1.66	2.7	5.4
20/11/2017	ETAM17W04122	BS/DL	6	Fill	Silty CLAY	Gully	1770245	5905404	-	150	3.5m to Finished Level	197+	197+	197+	197+	1.95	28.3	1.52	2.7	0.6

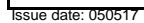
**Project No: 773-ETAM00525AA**


Work Order No: ETAM17W04122

2 of 2

Tested by: DL

Date tested: 20.11.17



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> 84 Thomas Road, Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2										
										 <div style="display: flex; justify-content: space-between; align-items: center;"> <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> </div> <div style="text-align: right;"> <p>Approved Signatory: Cesar Pura Issue date: 28/11/2017</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (t/m <sup>3</sup> )	Solid Density	Air Voids (%)
22/11/2017	ETAM17W04160	DL/BS	7	Fill	Silty CLAY	Gully 2	1770273	5905290	-	150	7.0m to Finished Level	197+	197+	197+	197+	1.89	37.8	1.37	2.70	0.0
22/11/2017	ETAM17W04160	DL/BS	8	Fill	Silty CLAY	Gully 2	1770268	5905312	-	150	7.0m to Finished Level	197+	197+	197+	197+	1.95	29.2	1.51	2.70	0.2
22/11/2017	ETAM17W04160	DL/BS	9	Fill	Silty CLAY	Gully 1	1770240	5905414	-	150	2.5m to Finished Level	172	138	189	144	1.90	25.7	1.51	2.70	5.0
22/11/2017	ETAM17W04160	DL/BS	10	Fill	Silty CLAY	Gully 1	1770235	5905422	-	150	2.5m to Finished Level	197+	197+	197+	197+	1.99	22.8	1.62	2.70	3.0
22/11/2017	ETAM17W04160	DL/BS	11	Fill	Silty CLAY	General Fill	1770453	5905193	-	150	2.0m to Finished Level	197	197	197	197	1.81	27.1	1.42	2.70	8.8
22/11/2017	ETAM17W04160	DL/BS	12	Fill	Silty CLAY	General Fill	1770439	5905179	-	150	2.0m to Finished Level	153	153	153	153	1.74	41.2	1.23	2.7	3.8
22/11/2017	ETAM17W04160	DL/BS	13	Fill	Silty CLAY	General Fill	1770534	5905188	-	150	2.5m to Finished Level	197	197	197	197	1.76	42.8	1.23	2.7	1.5
22/11/2017	ETAM17W04160	DL/BS	14	Fill	Silty CLAY	General Fill	1770523	5905198	-	150	2.5m to Finished Level	197	197	197	197	1.77	37.9	1.28	2.7	3.9
22/11/2017	ETAM17W04160	DL/BS	15	Fill	Silty CLAY	General Fill	1770501	5905211	-	150	2.0m to Finished Level	197	197	197	197	1.76	39.4	1.26	2.7	3.4

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM17W04160

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** DL/BS

**Date tested:** 22.11.17





<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> 84 Thomas Road, Flat Bush	<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="text-align: center; margin-top: 20px;">   <b>IANZ</b>          ACCREDITED LABORATORY       </div> <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> </div> <div style="text-align: right;"> <p><i>[Signature]</i>  <b>Approved Signatory:</b> Cesar Pura  <b>Issue date:</b> 29/11/2017</p> </div> </div>																																																																																																																																																																									
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																																																																																																																																																																										
<table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #e6f2ff;"> <th rowspan="2">Date</th> <th rowspan="2">Work Order No: ETAM...</th> <th rowspan="2">Tested by</th> <th rowspan="2">Test No.</th> <th rowspan="2">Layer</th> <th rowspan="2">Material tested</th> <th rowspan="2">Location</th> <th rowspan="2">Easting</th> <th rowspan="2">Northing</th> <th rowspan="2">RL</th> <th rowspan="2">Probe Test Depth (mm) FL = Finished level</th> <th rowspan="2">Comments</th> <th colspan="4">Field Shear Strength in kPa</th> <th rowspan="2">Wet Density (t/m<sup>3</sup>)</th> <th rowspan="2">Oven Water Content (%)</th> <th rowspan="2">Dry Density (t/m<sup>3</sup>)</th> <th rowspan="2">Solid Density</th> <th rowspan="2">Air Voids (%)</th> </tr> <tr style="background-color: #e6f2ff;"> <th colspan="4">UTP = Unable to penetrate</th> </tr> </thead> <tbody> <tr> <td>24/11/2017</td> <td>ETAM17W04231</td> <td>BS</td> <td>16</td> <td>Fill</td> <td>Silty CLAY</td> <td>General Fill</td> <td>1770493</td> <td>5905195</td> <td>-</td> <td>150</td> <td>0.5 Below Subgrade Level</td> <td>197+</td> <td>197+</td> <td>197+</td> <td>197+</td> <td>1.85</td> <td>33.0</td> <td>1.39</td> <td>2.7</td> <td>2.5</td> </tr> <tr> <td>24/11/2017</td> <td>ETAM17W04231</td> <td>BS</td> <td>17</td> <td>Fill</td> <td>Silty CLAY</td> <td>General Fill</td> <td>1770505</td> <td>5905201</td> <td>-</td> <td>150</td> <td>0.5 Below Subgrade Level</td> <td>197+</td> <td>197+</td> <td>197+</td> <td>197+</td> <td>1.75</td> <td>52.7</td> <td>1.15</td> <td>2.7</td> <td>0.0</td> </tr> <tr> <td>24/11/2017</td> <td>ETAM17W04231</td> <td>BS</td> <td>18</td> <td>Fill</td> <td>Silty CLAY</td> <td>Gully 2</td> <td>1770272</td> <td>5905291</td> <td>-</td> <td>150</td> <td>3.0 Below Subgrade Level</td> <td>197+</td> <td>197+</td> <td>197+</td> <td>197+</td> <td>1.88</td> <td>28.5</td> <td>1.46</td> <td>2.7</td> <td>4.2</td> </tr> <tr> <td>24/11/2017</td> <td>ETAM17W04231</td> <td>BS</td> <td>19</td> <td>Fill</td> <td>Silty CLAY</td> <td>Gully 1</td> <td>1770242</td> <td>5905409</td> <td>-</td> <td>150</td> <td>1.5 Below Subgrade Level</td> <td>197+</td> <td>197+</td> <td>197+</td> <td>197+</td> <td>1.91</td> <td>23.6</td> <td>1.55</td> <td>2.7</td> <td>6.3</td> </tr> <tr> <td>24/11/2017</td> <td>ETAM17W04231</td> <td>BS</td> <td>20</td> <td>Fill</td> <td>Silty CLAY</td> <td>General Fill</td> <td>1770521</td> <td>5905178</td> <td>-</td> <td>150</td> <td>0.5 Below Finished Level</td> <td>UTP</td> <td>UTP</td> <td>UTP</td> <td>UTP</td> <td>1.94</td> <td>26.3</td> <td>1.54</td> <td>2.7</td> <td>2.7</td> </tr> <tr> <td>24/11/2017</td> <td>ETAM17W04231</td> <td>BS</td> <td>21</td> <td>Fill</td> <td>Silty CLAY</td> <td>General Fill</td> <td>1770536</td> <td>5905181</td> <td>-</td> <td>150</td> <td>0.5 Below Finished Level</td> <td>197</td> <td>197</td> <td>197</td> <td>197</td> <td>1.88</td> <td>41.5</td> <td>1.33</td> <td>2.7</td> <td>0.0</td> </tr> </tbody> </table>																				Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (t/m <sup>3</sup> )	Solid Density	Air Voids (%)	UTP = Unable to penetrate				24/11/2017	ETAM17W04231	BS	16	Fill	Silty CLAY	General Fill	1770493	5905195	-	150	0.5 Below Subgrade Level	197+	197+	197+	197+	1.85	33.0	1.39	2.7	2.5	24/11/2017	ETAM17W04231	BS	17	Fill	Silty CLAY	General Fill	1770505	5905201	-	150	0.5 Below Subgrade Level	197+	197+	197+	197+	1.75	52.7	1.15	2.7	0.0	24/11/2017	ETAM17W04231	BS	18	Fill	Silty CLAY	Gully 2	1770272	5905291	-	150	3.0 Below Subgrade Level	197+	197+	197+	197+	1.88	28.5	1.46	2.7	4.2	24/11/2017	ETAM17W04231	BS	19	Fill	Silty CLAY	Gully 1	1770242	5905409	-	150	1.5 Below Subgrade Level	197+	197+	197+	197+	1.91	23.6	1.55	2.7	6.3	24/11/2017	ETAM17W04231	BS	20	Fill	Silty CLAY	General Fill	1770521	5905178	-	150	0.5 Below Finished Level	UTP	UTP	UTP	UTP	1.94	26.3	1.54	2.7	2.7	24/11/2017	ETAM17W04231	BS	21	Fill	Silty CLAY	General Fill	1770536	5905181	-	150	0.5 Below Finished Level	197	197	197	197	1.88	41.5	1.33	2.7	0.0
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (t/m <sup>3</sup> )	Solid Density													Air Voids (%)																																																																																																																																										
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24/11/2017	ETAM17W04231	BS	20	Fill	Silty CLAY	General Fill	1770521	5905178	-	150	0.5 Below Finished Level	UTP	UTP	UTP	UTP	1.94	26.3	1.54	2.7	2.7																																																																																																																																																						
24/11/2017	ETAM17W04231	BS	21	Fill	Silty CLAY	General Fill	1770536	5905181	-	150	0.5 Below Finished Level	197	197	197	197	1.88	41.5	1.33	2.7	0.0																																																																																																																																																						

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM17W04231

**Page No:** 2 of 2



**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS

**Date tested:** 24.11.17



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">   <b>IANZ</b>          ACCREDITED LABORATORY       </div> <div>         Tests indicated as not accredited are outside the scope of the laboratory's accreditation       </div> <div style="text-align: right;">   <b>Approved Signatory:</b> Cesar Pura  <b>Issue date:</b> 4/12/2017       </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (t/m <sup>3</sup> )	Solid Density	Air Voids (%)
27/11/2017	ETAM17W04287	BS	22	Fill	Silty CLAY	Gully 1 and 2 Combined	1770273	5905292	-	150	1.5m to Subgrade Level	197+	197+	197+	197+	1.97	23.8	1.59	2.7	3.5
27/11/2017	ETAM17W04287	BS	23	Fill	Silty CLAY	Gully 1 and 2 Combined	1770269	5905312	-	150	1.5m to Subgrade Level	197+	197+	197+	197+	1.92	22.3	1.57	2.7	7.0
27/11/2017	ETAM17W04287	BS	24	Fill	Silty CLAY	Gully 1 and 2 Combined	1770260	5905335	-	150	1.5m to Subgrade Level	172	172	172	172	1.92	25.9	1.53	2.7	3.9
27/11/2017	ETAM17W04287	BS	25	Fill	Silty CLAY	Gully 1 and 2 Combined	1770259	5905360	-	150	1.5m to Subgrade Level	153	153	153	153	1.88	31.0	1.43	2.7	2.4
27/11/2017	ETAM17W04287	BS	26	Fill	Silty CLAY	Gully 1 and 2 Combined	1770254	5905379	-	150	1.5m to Subgrade Level	197+	197+	197+	197+	1.81	34.4	1.35	2.7	4
27/11/2017	ETAM17W04287	BS	27	Fill	Silty CLAY	Gully 1 and 2 Combined	1770242	5905411	-	150	Subgrade Level	UTP	UTP	UTP	UTP	2.03	19.0	1.71	2.7	4.3
27/11/2017	ETAM17W04287	BS	28	Fill	Silty CLAY	Gully 1 and 2 Combined	1770233	5905420	-	150	Subgrade Level	UTP	UTP	UTP	UTP	1.96	22.9	1.60	2.7	4.2
27/11/2017	ETAM17W04287	BS	29	Fill	Silty CLAY	Gully 1 and 2 Combined	1770223	5905433	-	150	Subgrade Level	197+	197+	197+	197+	1.86	22.8	1.51	2.7	9.5
27/11/2017	ETAM17W04287	BS	30	Fill	Silty CLAY	General Fill	1770483	5905207	-	150	0.5m to Subgrade Level	197	197	197	197	1.85	39.7	1.32	2.7	0.0
27/11/2017	ETAM17W04287	BS	31	Fill	Silty CLAY	General Fill	1770490	5905194	-	150	0.5m to Subgrade Level	153	153	153	153	1.80	43.0	1.26	2.7	0.0
27/11/2017	ETAM17W04287	BS	32	Fill	Silty CLAY	General Fill	1770507	5905187	-	150	0.5m to Subgrade Level	197	197	197	197	1.84	34.3	1.37	2.7	2.5
27/11/2017	ETAM17W04287	BS	33	Fill	Silty CLAY	General Fill	1770533	5905168	-	150	0.5m to Subgrade Level	197	197	197	197	1.71	39.7	1.22	2.7	6.3

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM17W04287

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush


**Location:** As below

**Tested by:** BS

**Date tested:** 27.11.17





<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA										
<b>Address</b> PO Box 8261, Symonds Street, Auckland 1150										<b>Page:</b> 1 of 2										
<b>Attention:</b> Ray Berry										<div><div></div><div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div></div> <div><div>Approved Signatory:</div><div>Cesar Pura</div></div>										
<b>c.c:</b> Ray Berry																				
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush										<div><div>Issue date:</div><div>6/12/2017</div></div>										
<b>Location:</b> Flat Bush																				
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
29/11/2017	ETAM17W04352	AB	34	Fill	Silty CLAY	General Fill	1770473	5905213	-	150	0.5m to Subgrade Level	UTP	UTP	UTP	UTP	1.86	28.1	1.45	2.7	5.4
29/11/2017	ETAM17W04352	AB	35	Fill	Silty CLAY	General Fill	1770493	5905201	-	150	0.5m to Subgrade Level	161	168	218+	218+	1.78	45.9	1.22	2.7	0.0
29/11/2017	ETAM17W04352	AB	36	Fill	Silty CLAY	General Fill	1770515	5905193	-	150	0.5m to Subgrade Level	UTP	UTP	UTP	UTP	1.73	36.9	1.26	2.7	6.6
29/11/2017	ETAM17W04352	AB	37	Fill	Silty CLAY	General Fill	1770538	5905181	-	150	0.5m to Subgrade Level	UTP	UTP	UTP	UTP	1.89	30.5	1.45	2.7	2.0
29/11/2017	ETAM17W04352	AB	38	Fill	Silty CLAY	General Fill	1770529	5905173	-	150	0.5m to Subgrade Level	218+	218+	218+	218+	1.81	37.0	1.32	2.7	2.1
29/11/2017	ETAM17W04352	AB	39	Fill	Silty CLAY	General Fill	1770518	5905186	-	150	0.5m to Subgrade Level	181	141	154	148	1.70	54.3	1.10	2.7	0.0
29/11/2017	ETAM17W04352	AB	40	Fill	Silty CLAY	General Fill	1770498	5905190	-	150	0.5m to Subgrade Level	161	194	201	161	1.76	41.9	1.24	2.7	2.0
29/11/2017	ETAM17W04352	DL	41	Fill	Silty CLAY	Gully Fill	1770260	5905292	-	150	2m to Subgrade Level	UTP	UTP	UTP	UTP	1.98	19.5	1.66	2.7	6.2
29/11/2017	ETAM17W04352	DL	42	Fill	Silty CLAY	Gully Fill	1770265	5905314	-	150	2m to Subgrade Level	189	192	172	151	2.04	17.5	1.74	2.7	5.2
29/11/2017	ETAM17W04352	DL	43	Fill	Silty CLAY	Gully Fill	1770265	5905327	-	150	2m to Subgrade Level	191	196	187	172	1.88	29.1	1.45	2.7	3.8
29/11/2017	ETAM17W04352	DL	44	Fill	Silty CLAY	Gully Fill	1770260	5905339	-	150	2m to Subgrade Level	192	196	196	197	1.89	28.8	1.47	2.7	3.2
29/11/2017	ETAM17W04352	DL	45	Fill	Silty CLAY	Gully Fill	1770257	5905352	-	150	2m to Subgrade Level	UTP	UTP	UTP	196	1.93	28.9	1.50	2.7	1.1
29/11/2017	ETAM17W04352	DL	46	Fill	Silty CLAY	Gully Fill	1770255	5905367	-	150	2m to Subgrade Level	172	144	148	155	1.81	38.8	1.30	2.7	1.0
29/11/2017	ETAM17W04352	DL	47	Fill	Silty CLAY	Gully Fill	1770252	5905384	-	150	2m to Subgrade Level	UTP	161	170	196	1.87	25.0	1.50	2.7	7.3
29/11/2017	ETAM17W04352	DL	48	Fill	Silty CLAY	Gully Fill	1770246	5905413	-	150	2m to Subgrade Level	153	153	153	197	1.88	36.6	1.37	2.7	0.0
29/11/2017	ETAM17W04352	DL	49	Fill	Silty CLAY	Gully Fill	1770238	5905428	-	150	2m to Subgrade Level	UTP	UTP	UTP	UTP	2.00	22.4	1.63	2.7	2.8
29/11/2017	ETAM17W04352	DL	50	Fill	Silty CLAY	Gully Fill	1770229	5905437	-	150	2m to Subgrade Level	191	172	148	157	1.96	20.4	1.63	2.7	6.5

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM17W04352

**Page No:** 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** Refer to plan

**Tested by:** AB/DL

**Date tested:** 29.11.17



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> </div> <div style="margin-left: 100px; text-align: right;"> <p>Approved Signatory: Cesar Pura Issue date: 9/12/2017</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
4/12/2017	ETAM17W04420	DL	51	Fill	Silty CLAY	General Fill	1770479	5905208	-	150	300mm below Subgrade Level	196	172	197	UTP	1.87	24.5	1.50	2.7	7.4
4/12/2017	ETAM17W04420	DL	52	Fill	Silty CLAY	General Fill	1770512	5905193	-	150	300mm below Subgrade Level	116	136	136	109	1.78	37.7	1.30	2.7	3.1
4/12/2017	ETAM17W04420	DL	53	Fill	Silty CLAY with aggregates	General Fill	1770227	5905419	-	150	1m below Subgrade Level	UTP	UTP	UTP	UTP	1.99	22.3	1.63	2.7	3.3
4/12/2017	ETAM17W04420	DL	54	Fill	Silty CLAY with aggregates	General Fill	1770254	5905379	-	150	1m below Subgrade Level	168	192	161	172	1.92	26.5	1.52	2.7	3.7
4/12/2017	ETAM17W04420	DL	55	Fill	Silty CLAY	Gully Fill	1770272	5905271	-	150	3m to Subgrade Level	UTP	UTP	UTP	UTP	1.89	32.1	1.43	2.7	1.2

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM17W04420

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** Refer to plan

**Tested by:**



DL

**Date tested:**

04.12.17





<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center; justify-content: space-between; padding: 10px;"> <div style="text-align: center;">  <p><b>IANZ</b> ACCREDITED LABORATORY</p> </div> <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> </div> <div style="text-align: right;">   <p>Approved Signatory: Cesar Pura Issue date: 12/12/2017</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
5/12/2017	ETAM17W04456	DL	56	Fill	Silty CLAY	General Fill	1770522	5905185	-	150	300mm below Subgrade Level	196	192	197	UTP	1.77	40.3	1.26	2.7	2.4
5/12/2017	ETAM17W04456	DL	57	Fill	Silty CLAY	General Fill	1770474	5905205	-	150	300mm below Subgrade Level	192	168	172	165	1.78	38.0	1.29	2.7	3.3

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM17W04456

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below



**Tested by:**

DL

**Date tested:**

05.12.17



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center; justify-content: space-between; padding: 10px;"> <div style="text-align: center;">   <b>IANZ</b>          ACCREDITED LABORATORY       </div> <div>         Tests indicated as not accredited are outside the scope of the laboratory's accreditation       </div> <div style="text-align: right;">   <b>Approved Signatory:</b> Cesar Pura  <b>Issue date:</b> 13/12/2017       </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
6/12/2017	ETAM17W04478	BS	58	Fill	Silty CLAY	General Fill	1770241	5905364	-	150	3m to Subgrade Level	116	112	122	116	1.86	27.5	1.46	2.7	5.7
6/12/2017	ETAM17W04478	BS	59	Fill	Silty CLAY	General Fill	1770260	5905327	-	150	3m to Subgrade Level	UTP	UTP	UTP	UTP	2.00	24.0	1.61	2.7	1.6

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM17W04478

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush



**Location:** As below

**Tested by:** BS

**Date tested:** 06.12.17





<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center; justify-content: space-between; padding: 10px;"> <div style="text-align: center;">  <p><b>IANZ</b> ACCREDITED LABORATORY</p> </div> <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> </div> <div style="text-align: right;">   <p>Approved Signatory: Cesar Pura Issue date: 14/12/2017</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
7/12/2017	ETAM17W04489	BS	60	Fill	Silty CLAY	Gully	1770273	5905296	-	150		197	197	197	197	1.98	24.2	1.60	2.7	2.3
7/12/2017	ETAM17W04489	BS	61	Fill	Silty CLAY	Gully	1770264	5905336	-	150		197	197	197	197	1.91	22.4	1.56	2.7	7.2

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM17W04489

**Page No:** 2 of 2



**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS

**Date tested:** 07.12.17



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center; justify-content: space-between; padding: 10px;"> <div style="text-align: center;">  <p><b>IANZ</b> ACCREDITED LABORATORY</p> </div> <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> </div> <div style="text-align: right;">   <p>Approved Signatory: Cesar Pura Issue date: 14/12/2017</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001):Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
8/12/2017	ETAM17W04533	BS	62	Fill	Silty CLAY	General Fill	1770426	5905157	-	150		UTP	UTP	UTP	UTP	1.75	36.0	1.29	2.7	6.1
8/12/2017	ETAM17W04533	BS	63	Fill	Silty CLAY	General Fill	1770450	5905185	-	150		197	197	197	197	1.77	41.5	1.25	2.7	1.9

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM17W04533

**Page No:** 2 of 2



**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS

**Date tested:** 08.12.17



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center; justify-content: space-between; padding: 10px;"> <div style="text-align: center;">   <b>IANZ</b>          ACCREDITED LABORATORY       </div> <div>         Tests indicated as not accredited are outside the scope of the laboratory's accreditation       </div> <div style="text-align: right;">           Approved Signatory: Eric Paton          Issue date: 18/12/2017       </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
14/12/2017	ETAM17W04688	BS	69	Fill	Silty CLAY	Ref to plan	1770376	5905277	-	150	500mm to S/G Level	172	189	189	189	1.78	39.9	1.27	2.7	2.0
14/12/2017	ETAM17W04688	BS	70	Fill	Silty CLAY	Ref to plan	1770399	5905253	-	150	500mm to S/G Level	189	189	189	189	1.78	38.6	1.28	2.7	2.9



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM17W04688

**Page No:** 2 of 2



**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS

**Date tested:** 14.12.17



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2										
										 <div style="display: flex; justify-content: space-between; align-items: center;"> <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> </div> <div style="text-align: right;">   <b>Approved Signatory:</b> Eric Paton  <b>Issue date:</b> 19/12/2017         </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
15/12/2017	ETAM17W04698	BS	71	Fill	Silty CLAY	Ref to plan	1770275	5905271	-	150	3m to Subgrade Level	UTP	UTP	UTP	UTP	1.85	26.0	1.47	2.7	7.3
15/12/2017	ETAM17W04698	BS	72	Fill	Silty CLAY	Ref to plan	1770284	5905194	-	150	3m to Subgrade Level	189	189	189	189	1.94	40.5	1.38	2.7	0.0

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM17W04698

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush


**Location:** As below

**Tested by:** BS

**Date tested:** 15.12.17





<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> <p>Approved Signatory: Cesar Pura</p> <p>Issue date: 18/01/2018</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
15/01/2018	ETAM18W00121	DL	88	Fill	Silty CLAY	General Fill	1770189	5905239	-	150	At Finish Level	UTP	UTP	UTP	UTP	1.95	21.9	1.60	2.7	5.5
15/01/2018	ETAM18W00121	DL	89	Fill	Silty CLAY	General Fill	1770268	5905275	-	150	At Finish Level	197+	197+	197+	197+	1.79	35.9	1.32	2.7	3.8
15/01/2018	ETAM18W00121	DL	90	Fill	Silty CLAY	General Fill	1770275	5905213	-	150	At Finish Level	172	165	153	161	1.76	35.6	1.30	2.7	5.5

## SITE PLAN

NOT TO SCALE

**Project No: 773-ETAM00525AA**

Work Order No: ETAM18W00121

Page No: 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

Tested by: DL

Date tested: 15.01.18



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> </div> <div style="margin-left: 100px; text-align: right;"> <p>Approved Signatory: Cesar Pura</p> <p>Issue date: 22/01/2018</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
17/01/2018	ETAM18W00166	BS	91	Fill	Silty CLAY	Main Gully	1770274	5905224	-	150	850mm to Subgrade Level	220+	220+	220+	220+	1.86	30.9	1.42	2.7	3.6
17/01/2018	ETAM18W00166	BS	92	Fill	Silty CLAY	Main Gully	1770278	5905268	-	150	850mm to Subgrade Level	217	217	217	217	1.85	36.0	1.36	2.7	0.9



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W00166

**Page No:** 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS

**Date tested:** 17.01.18



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> <p>Approved Signatory: Cesar Pura</p> <p>Issue date: 30/01/2018</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
26/01/2018	ETAM18W00243	BS	93	Fill	Silty CLAY	Main Gully	1770264	5905229	-	150	1m below Subgrade Level	145	145	159	159	1.81	27.0	1.42	2.7	9.0
26/01/2018	ETAM18W00243	BS	94	Fill	Silty CLAY	Main Gully	1770279	5905282	-	150	1m below Subgrade Level	145	145	145	152	1.78	38.3	1.29	2.7	2.8

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W00243

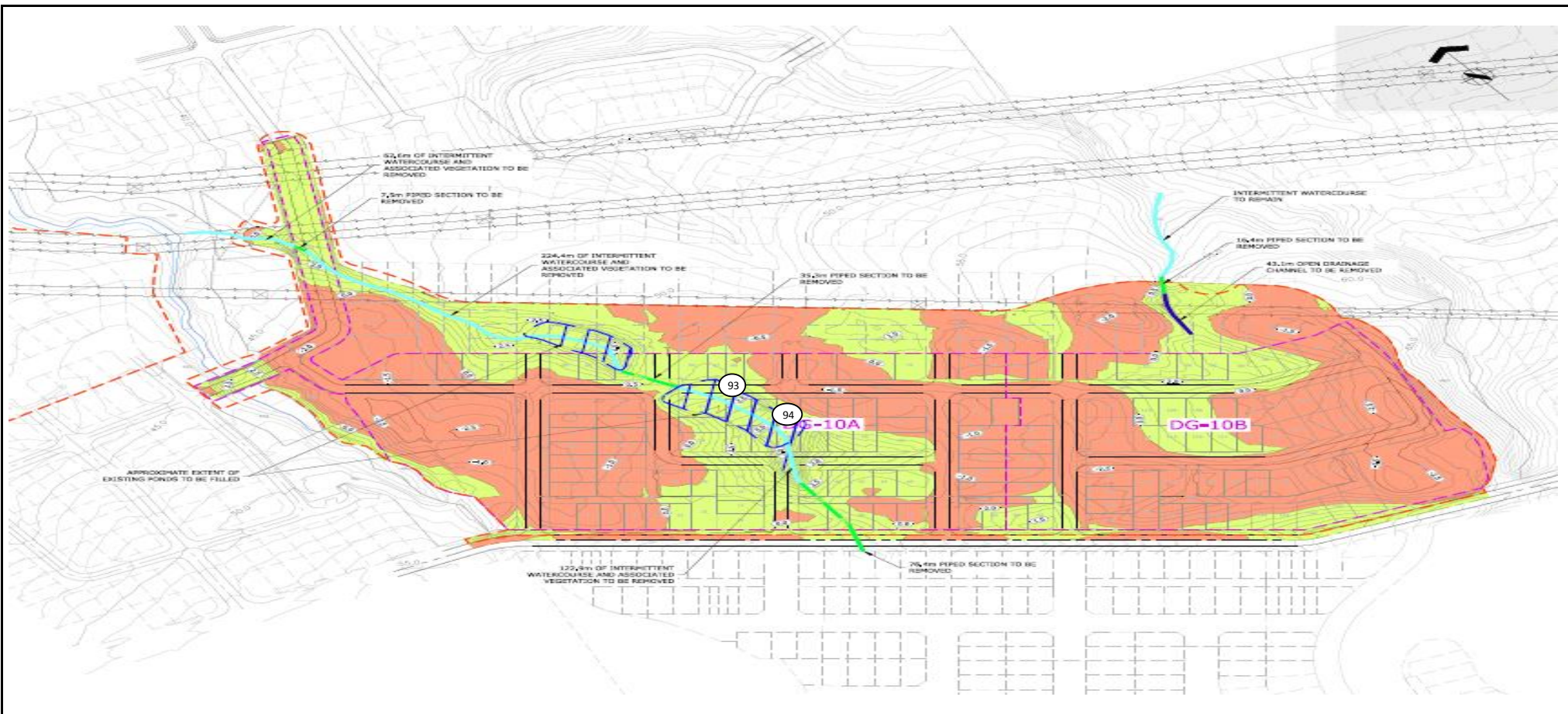
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush


**Location:** As below

**Tested by:** BS

**Date tested:** 26.01.18





<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> <p>Approved Signatory: Cesar Pura</p> <p>Issue date: 1/02/2018</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
30/01/2018	ETAM18W00291	BS	95	Fill	Silty CLAY	Main Gully	1770264	5905181	-	150	1.0m to Finished Level	UTP	UTP	UTP	UTP	1.96	22.1	1.61	2.7	5.0
30/01/2018	ETAM18W00291	BS	96	Fill	Silty CLAY	Main Gully	1770275	5905207	-	150	1.0m to Finished Level	UTP	UTP	UTP	UTP	1.99	21.4	1.64	2.7	4.3

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W00291

**Page No:** 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS

**Date tested:** 30.01.18



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> <p>Approved Signatory: Cesar Pura</p> <p>Issue date: 2/02/2018</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
31/01/2018	ETAM18W00303	BS	97	Fill	Silty CLAY	Main Gully	1770260	5905192	-	150	1.0m to Subgrade Level	UTP	UTP	UTP	UTP	1.91	23.1	1.55	2.7	6.8
31/01/2018	ETAM18W00303	BS	98	Fill	Silty CLAY	Main Gully	1770257	5905216	-	150	1.0m to Subgrade Level	UTP	UTP	UTP	UTP	1.91	22.2	1.56	2.7	7.6



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W00303

**Page No:** 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS

**Date tested:** 31.01.18



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> <p>Approved Signatory: Cesar Pura</p> <p>Issue date: 8/02/2018</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
1/02/2018	ETAM18W00342	FP	99	Fill	Silty CLAY	General Fill	1770276	5905185	-	150	At Subgrade Level	UTP	UTP	UTP	UTP	2.00	24.0	1.61	2.7	1.6
1/02/2018	ETAM18W00342	FP	100	Fill	Silty CLAY	General Fill	1770249	5905413	-	150	~0.5m below Subgrade Level	UTP	UTP	UTP	UTP	1.87	26.2	1.48	2.7	6.5

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W00342

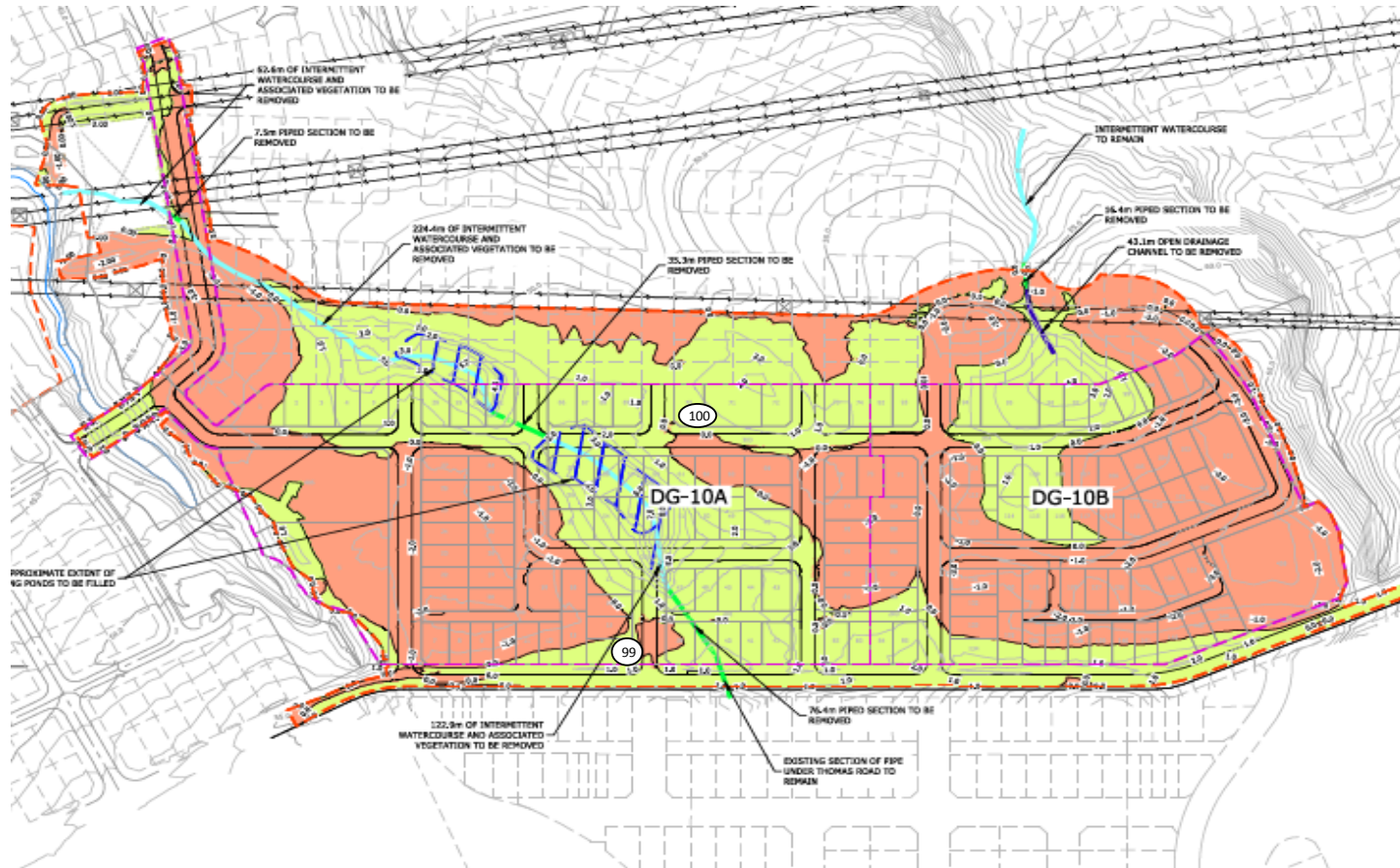
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush


**Location:** General Fill, As below

**Tested by:** FP

**Date tested:** 01.02.18





<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> <p>Approved Signatory: Cesar Pura</p> <p>Issue date: 12/02/2018</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
8/02/2018	ETAM18W00400	FP	101	Fill	Silty CLAY	Road 7	1770304	5905310	-	150	At Subgrade Level	157	161	161	150	1.89	28.1	1.48	2.7	3.7
8/02/2018	ETAM18W00400	FP	102	Fill	Silty CLAY	Road 7	1770359	5905271	-	150	At Subgrade Level	150	161	146	143	1.84	43.5	1.28	2.7	0.0

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W00400

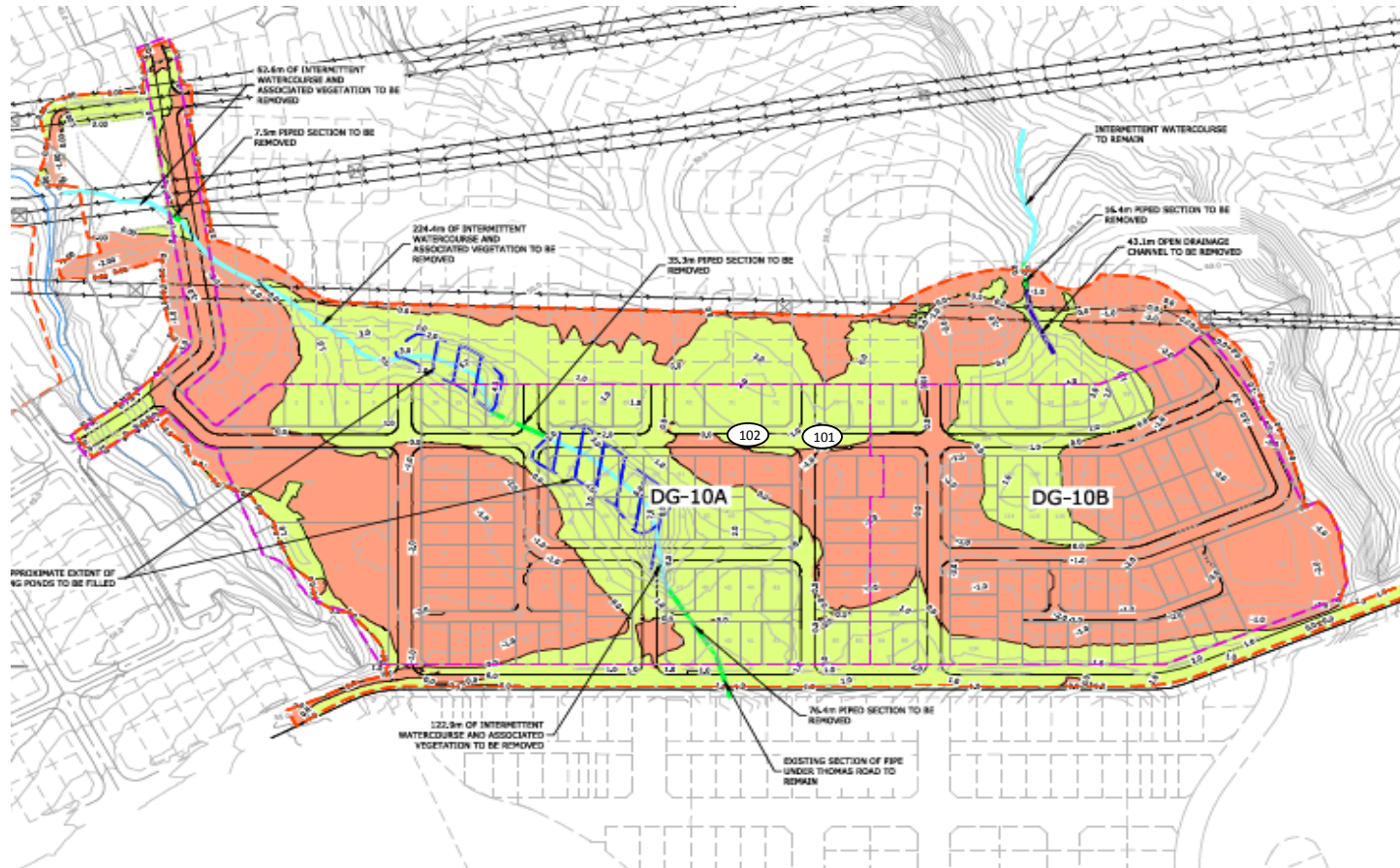
**Page No:** 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** FP

**Date tested:** 08.02.18



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> <p>Approved Signatory: Cesar Pura</p> <p>Issue date: 21/02/2018</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001); Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2); Water Content Testing (in accordance with NZS 4402:1986 Test 2.1); Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
19/02/2018	ETAM18W00562	BS	103	Fill	Silty CLAY	Old Pond Fill	1770241	5905389	-	150	700mm to Subgrade Level	159	220+	220+	220+	1.84	34.3	1.37	2.7	2.5
19/02/2018	ETAM18W00562	BS	104	Fill	Silty CLAY	Old Pond Fill	1770217	5905400	-	150	700mm to Subgrade Level	152	178	191	191	1.85	31.1	1.41	2.7	3.8

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W00562

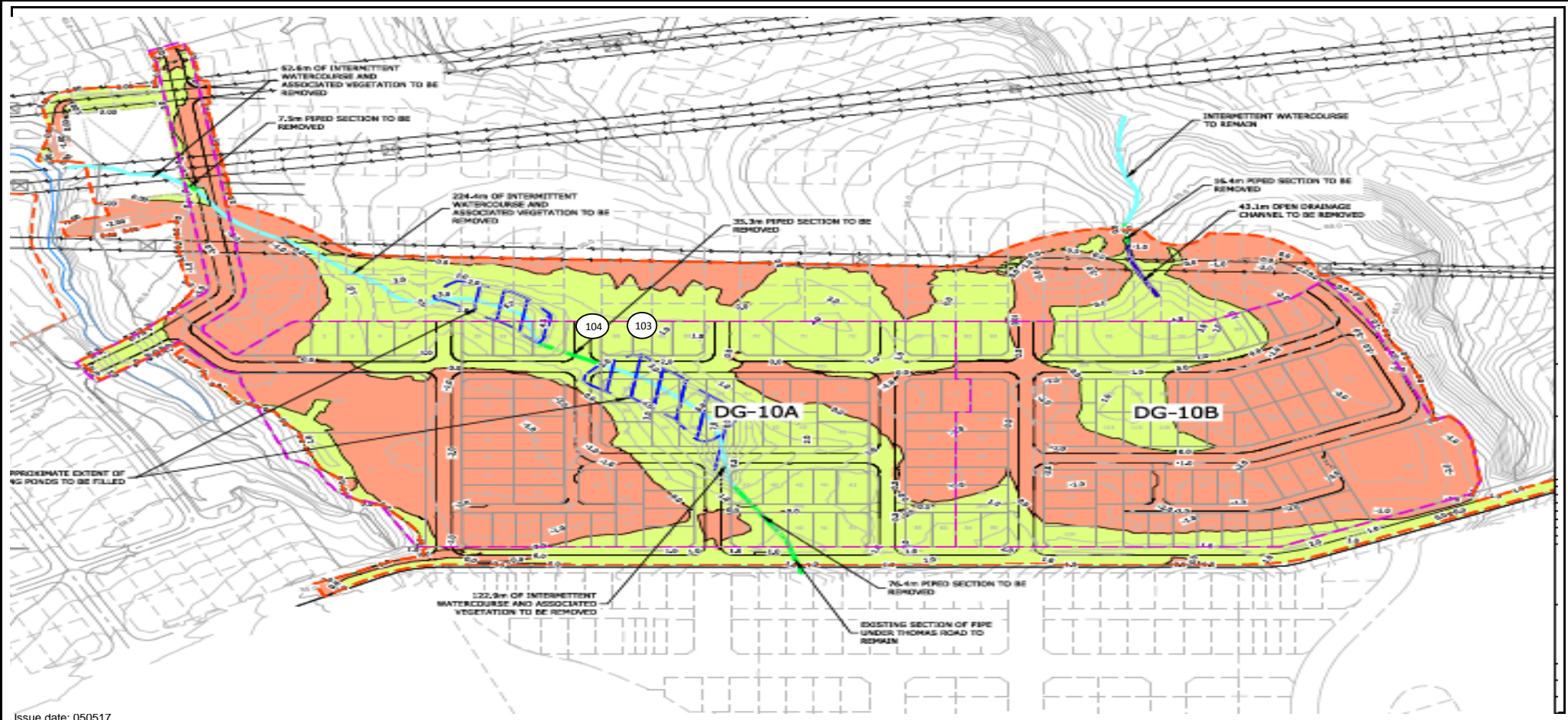
**Page No:** 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS

**Date tested:** 19.02.18



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> <p>Approved Signatory: Cesar Pura</p> <p>Issue date: 23/02/2018</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001); Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2); Water Content Testing (in accordance with NZS 4402:1986 Test 2.1); Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
22/02/2018	ETAM18W00618	BS	107	Fill	Silty CLAY	Main Gully	1770275	5905187	-	150	Final Level	UTP	UTP	UTP	UTP	1.86	28.0	1.45	2.7	5.5
22/02/2018	ETAM18W00618	BS	108	Fill	Silty CLAY	Main Gully	1770288	5905169	-	150	Final Level	UTP	UTP	UTP	UTP	1.86	32.3	1.40	2.7	2.7



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W00618

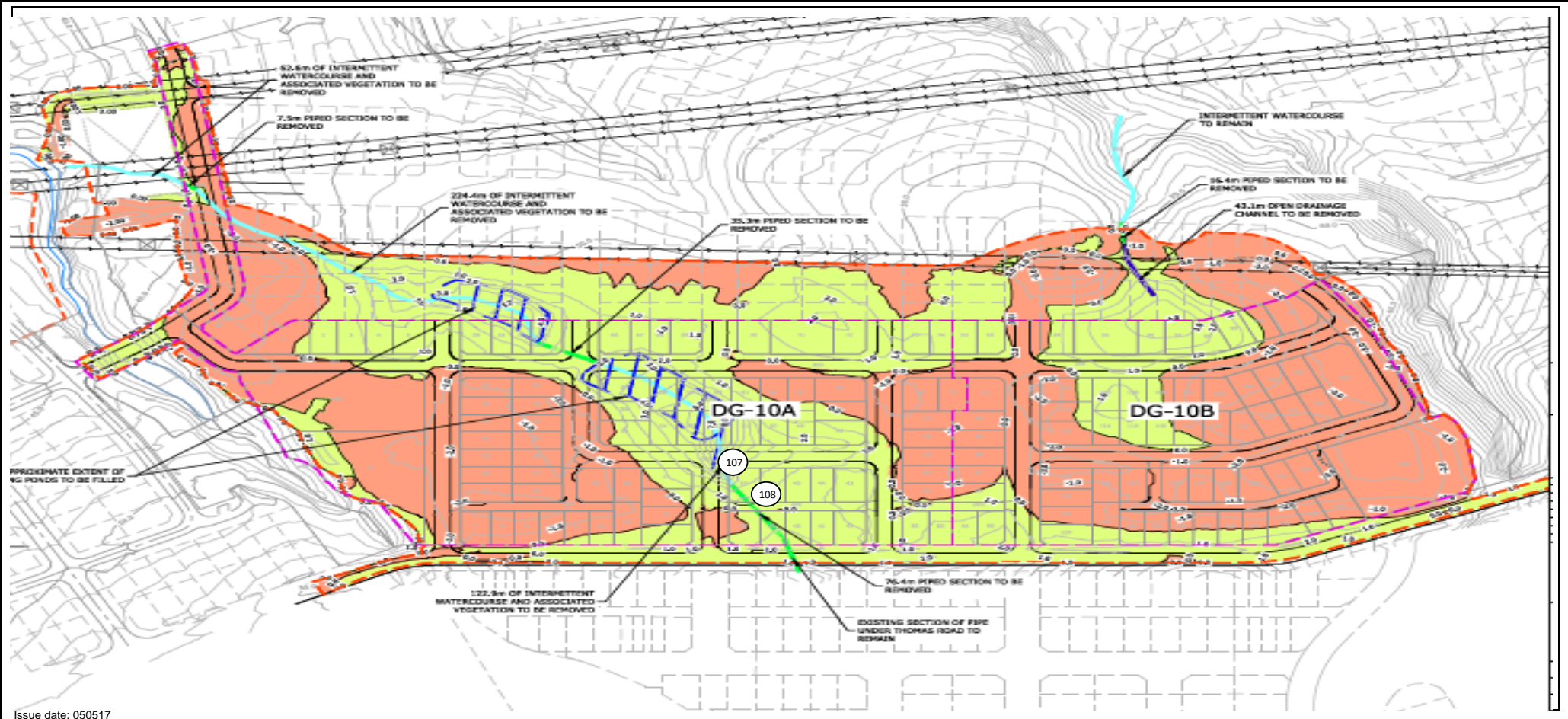
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush



**Location:** As below

**Tested by:** BS

**Date tested:** 22.02.18





<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> </div> <div style="margin-left: 100px; text-align: right;">   <b>Approved Signatory:</b> Cesar Pura  <b>Issue date:</b> 27/02/2018         </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
23/02/2018	ETAM18W00684	BS	109	Fill	Silty CLAY	Old Pond Fill	1770257	5905370	-	150	1.0m to Subgrade Level	159	178	220+	191	1.84	30.7	1.40	2.7	4.9
23/02/2018	ETAM18W00684	BS	110	Fill	Silty CLAY	Old Pond Fill	1770232	5905386	-	150	1.0m to Subgrade Level	178	159	159	159	1.83	28.7	1.42	2.7	6.3

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W00684

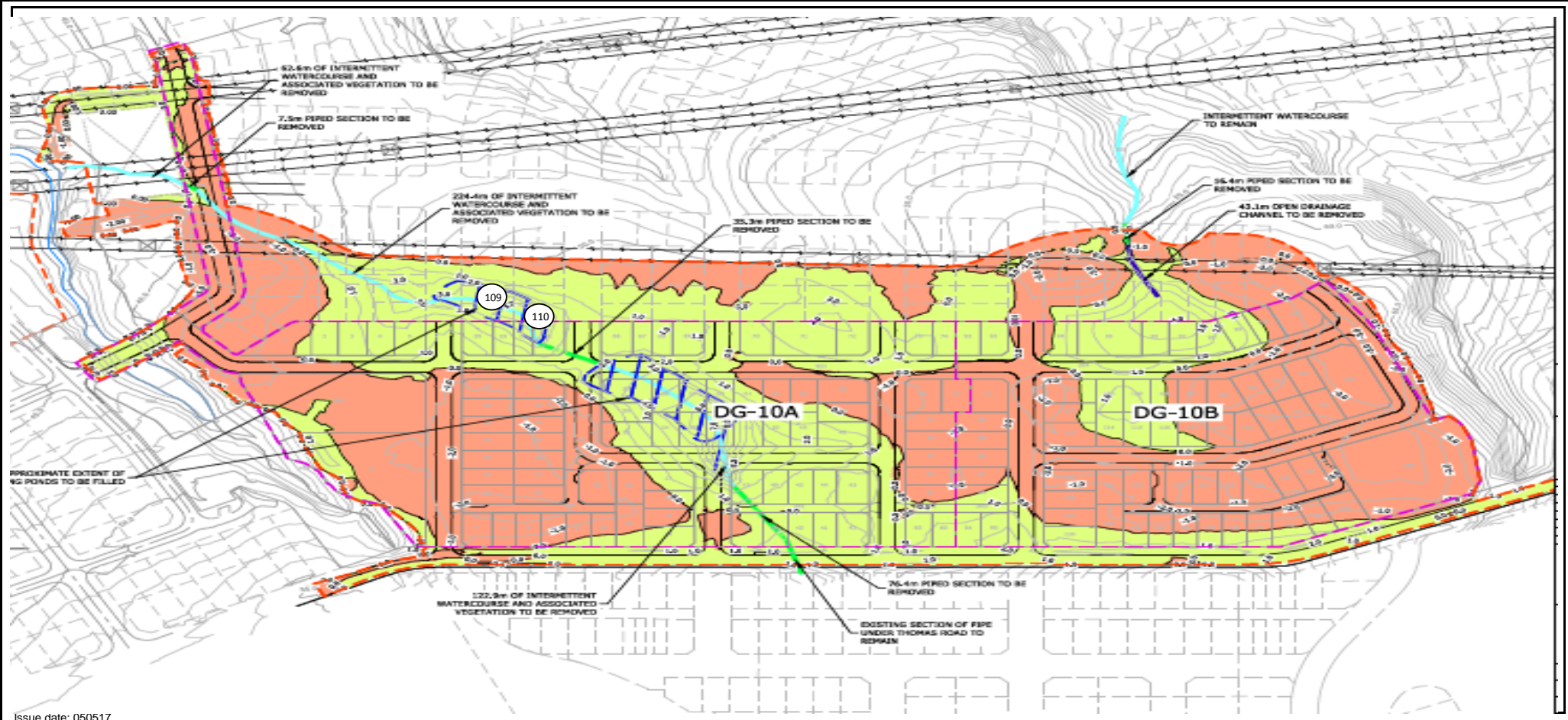
**Page No:** 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS

**Date tested:** 23.02.18



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> <p>Approved Signatory: Cesar Pura</p> <p>Issue date: 2/03/2018</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
27/02/2018	ETAM18W00750	BS	113	Fill	Silty CLAY	Old Pond	1770250	5905373	-	150	300mm to Subgrade Level	220+	220+	191	191	1.86	29.4	1.44	2.7	4.4
27/02/2018	ETAM18W00750	BS	114	Fill	Silty CLAY	Old Pond	1770262	5905361	-	150	300mm to Subgrade Level	UTP	UTP	220+	220+	1.81	28.6	1.41	2.7	7.6

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W00750

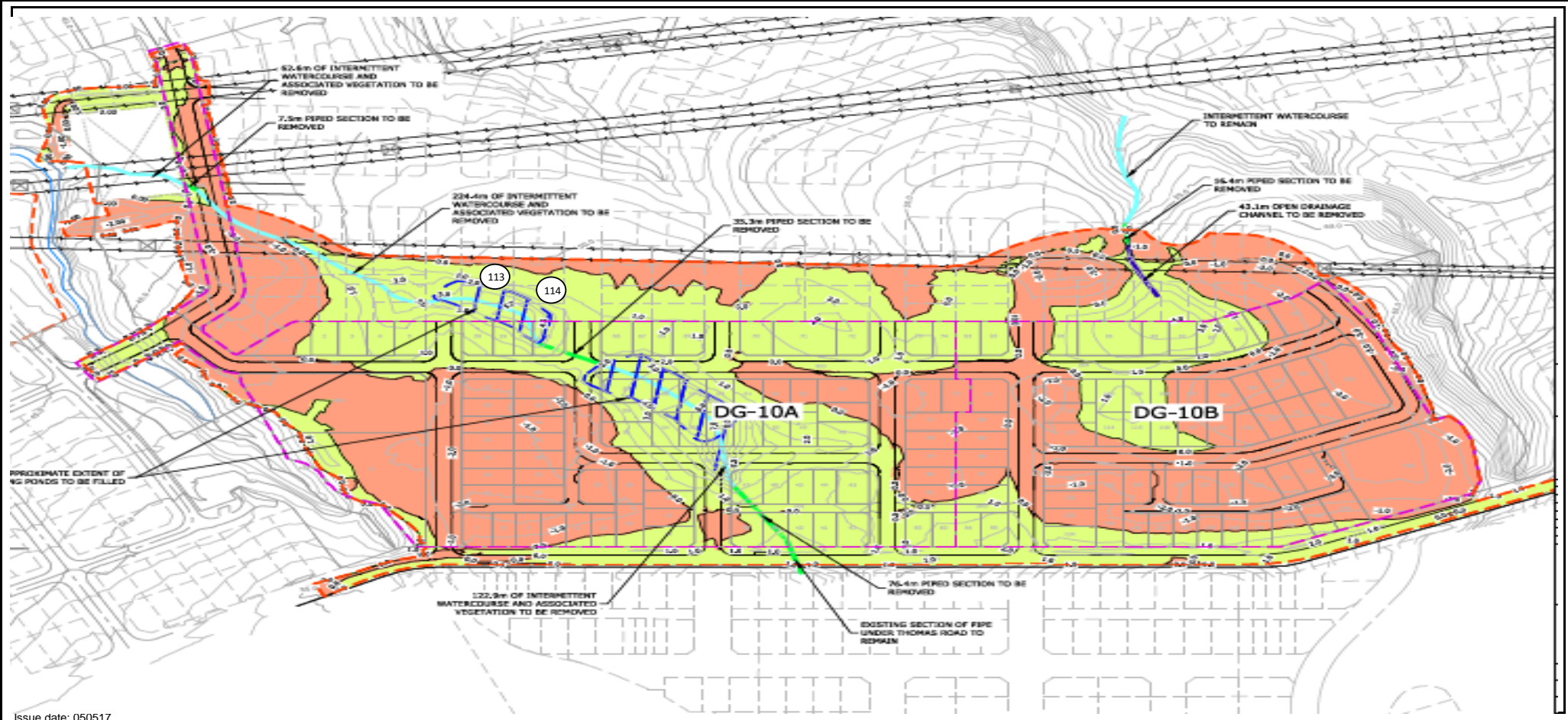
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush


**Location:** As below

**Tested by:** BS

**Date tested:** 27.02.18





<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> <p>Approved Signatory: Cesar Pura</p> <p>Issue date: 6/03/2018</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
1/03/2018	ETAM18W00805	BS	115	Fill	Silty CLAY	Old Gully	1770266	5905360	-	150	-	191	191	191	191	1.84	28.9	1.43	2.7	5.8
1/03/2018	ETAM18W00805	BS	116	Fill	Silty CLAY	Old Gully	1770252	5905368	-	150	-	159	159	191	191	1.84	27.5	1.45	2.7	6.7



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W00805

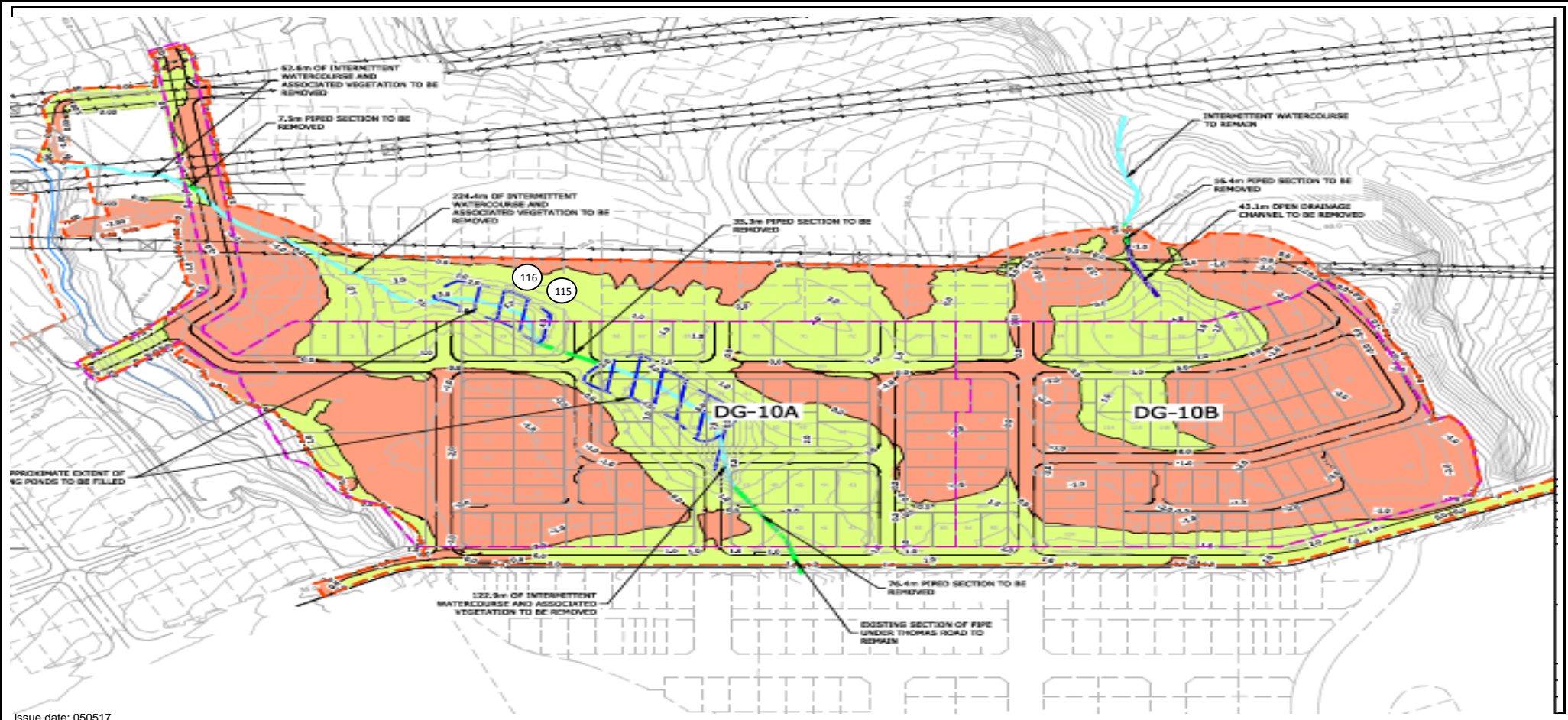
**Page No:** 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS

**Date tested:** 01.03.18



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> <p>Approved Signatory: Cesar Pura</p> <p>Issue date: 8/03/2018</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
2/03/2018	ETAM18W00841	BS	117	Fill	Silty CLAY	Pond A	1770492	5905191	-	150	500mm to Subgrade Level	220+	220+	220+	220+	1.58	48.9	1.06	2.7	8.9
2/03/2018	ETAM18W00841	BS	118	Fill	Silty CLAY	Pond A	1770482	5905210	-	150	500mm to Subgrade Level	220+	220+	220+	220+	1.57	50.1	1.04	2.7	9.0

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W00841

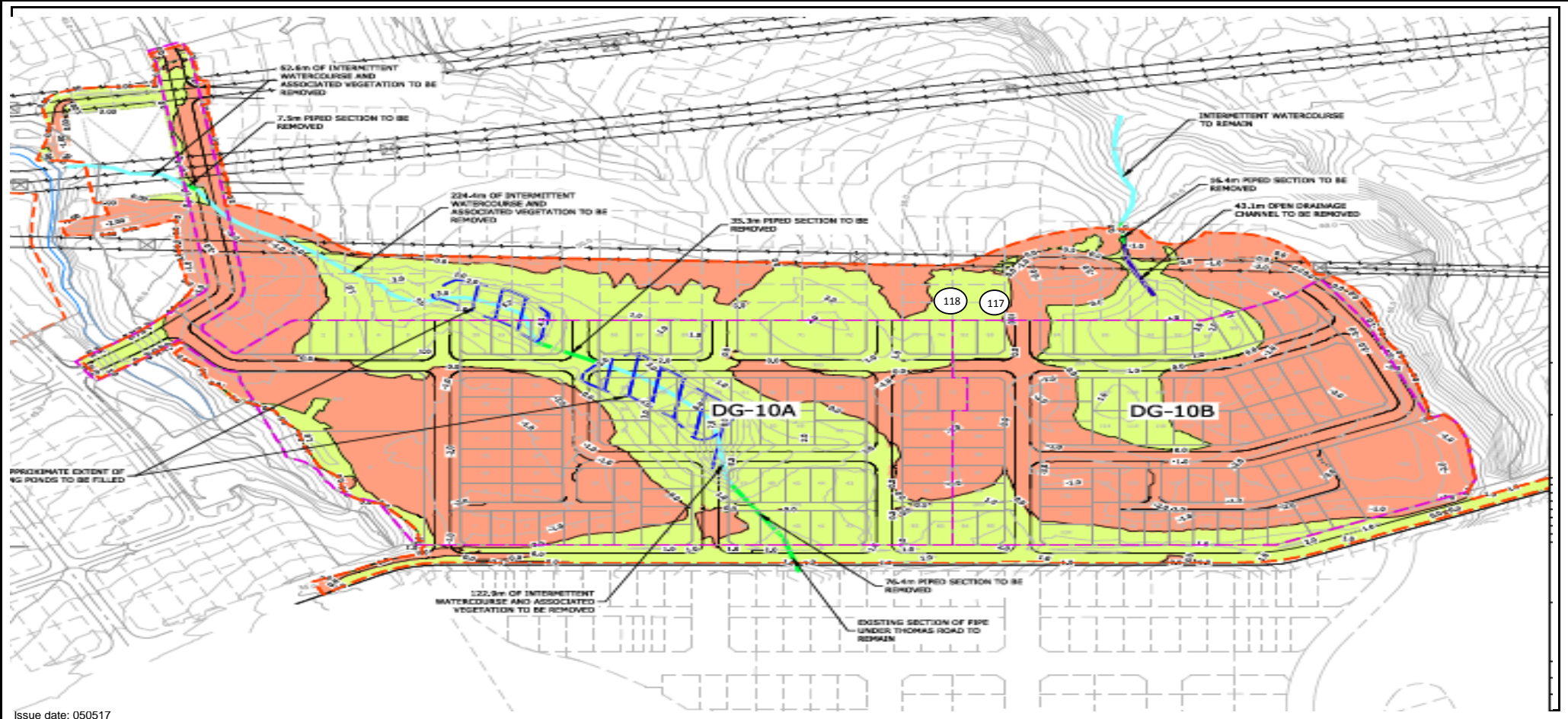
**Page No:** 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS

**Date tested:** 02.03.18



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> <p>Approved Signatory: Cesar Pura</p> <p>Issue date: 8/03/2018</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
5/03/2018	ETAM18W00854	BS	119	Fill	Silty CLAY	Pond B	1770406	5905253	-	150	-	UTP	UTP	159	191	1.73	32.4	1.31	2.7	9.3
5/03/2018	ETAM18W00854	BS	120	Fill	Silty CLAY	Old Gully	1770281	5905350	-	150	-	UTP	UTP	UTP	UTP	1.89	29.0	1.47	2.7	3.1



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W00854

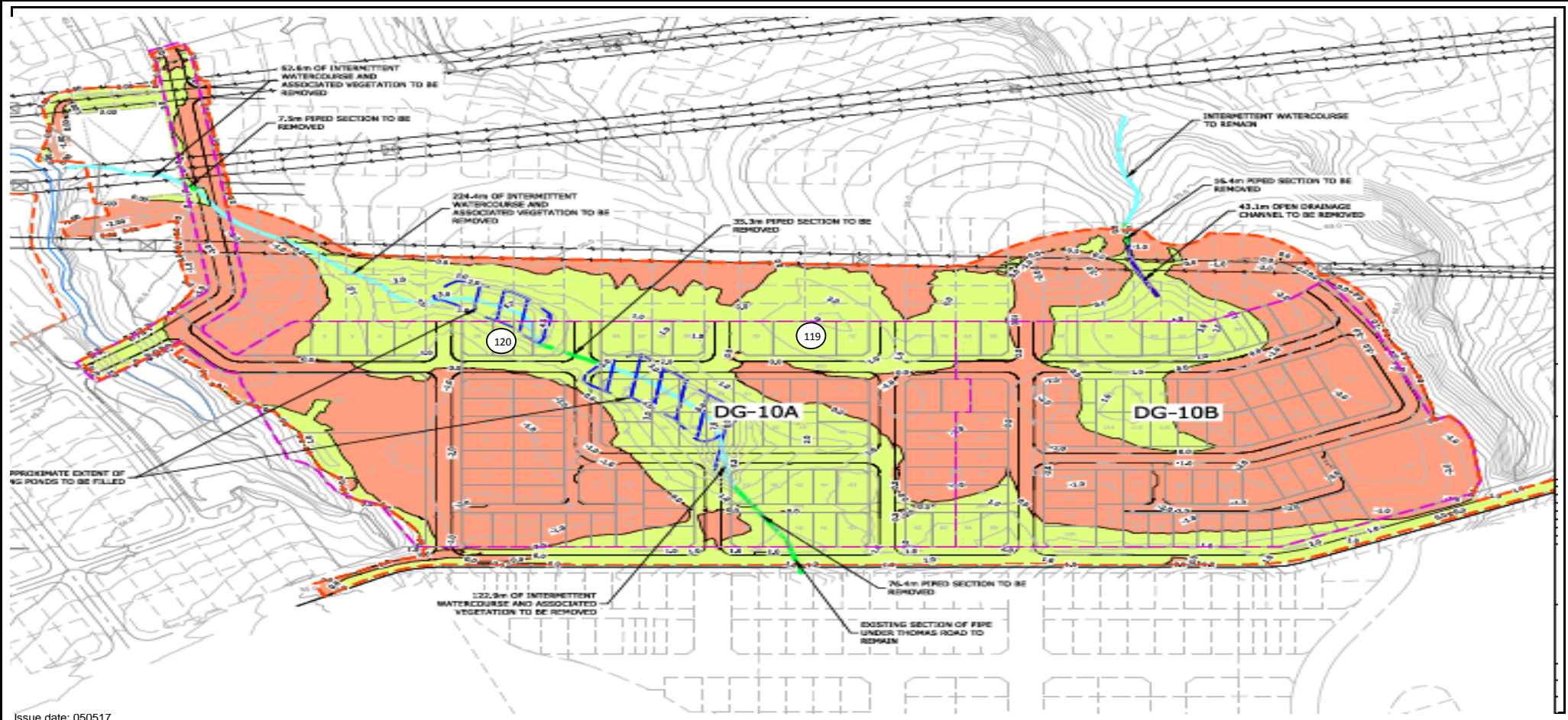
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush


**Location:** As below

**Tested by:** BS

**Date tested:** 05.03.18





<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> <p>Approved Signatory: Cesar Pura</p> <p>Issue date: 9/03/2018</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
6/03/2018	ETAM18W00879	BS	121	Fill	Silty CLAY	General Fill	1770387	5905269	-	150	500mm to Subgrade Level	UTP	UTP	152	152	1.72	28.5	1.34	2.7	12.4
6/03/2018	ETAM18W00879	BS	122	Fill	Silty CLAY	General Fill	1770352	5905296	-	150	500mm to Subgrade Level	UTP	UTP	UTP	UTP	1.71	40.9	1.21	2.7	5.4

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W00879

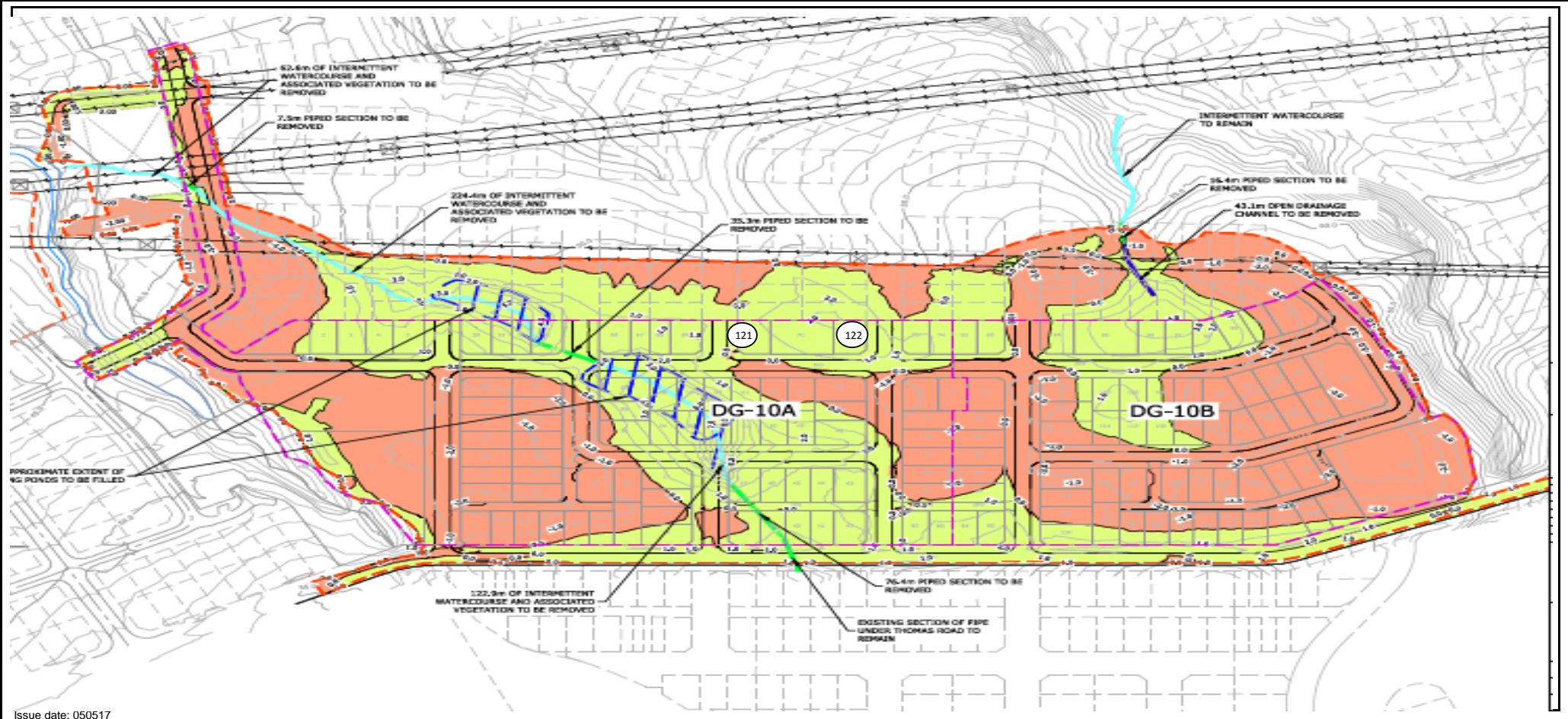
**Page No:** 2 of 2



**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS

**Date tested:** 06.03.18



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div> <p>Approved Signatory: Cesar Pura</p> <p>Issue date: 13/03/2018</p> </div>  </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
8/03/2018	ETAM18W00893	BS	123	Fill	Silty CLAY	Pond B	1770381	5905265	-	150	200mm to Subgrade Level	191	UTP	UTP	UTP	1.76	22.6	1.43	2.7	14.6
8/03/2018	ETAM18W00893	BS	124	Fill	Silty CLAY	Pond B	1770369	5905278	-	150	200mm to Subgrade Level	UTP	UTP	UTP	UTP	1.75	25.2	1.39	2.7	13.2

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W00893

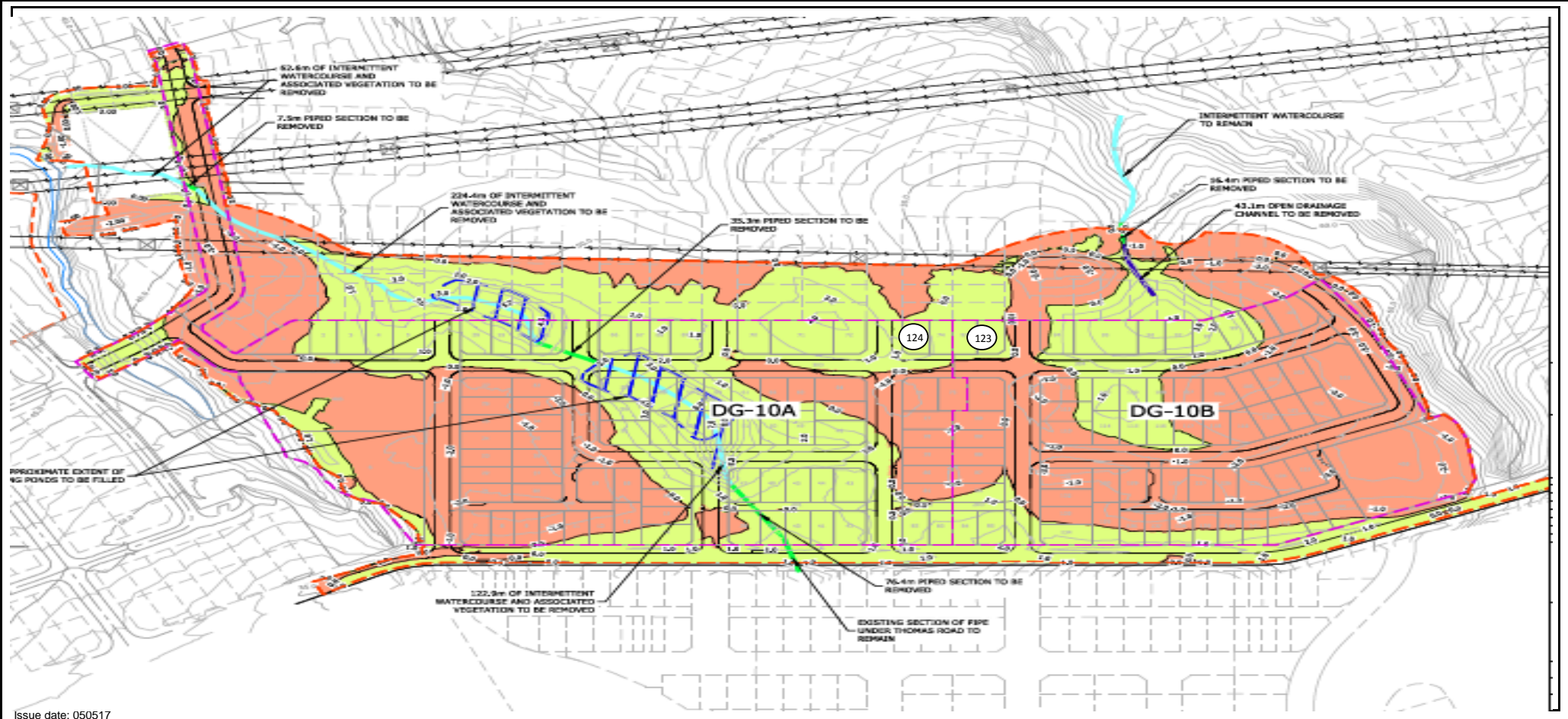
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush



**Location:** As below

**Tested by:** BS

**Date tested:** 08.03.18





<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div> <p>Approved Signatory: Cesar Pura</p> <p>Issue date: 15/03/2018</p> </div>  </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
9/03/2018	ETAM18W00922	BS	125	Fill	Silty CLAY	General Fill	1770361	5905286	-	150	300mm to Subgrade Level	UTP	UTP	UTP	UTP	1.73	33.1	1.30	2.7	8.7
9/03/2018	ETAM18W00922	BS	126	Fill	Silty CLAY	General Fill	1770419	5905252	-	150	300mm to Subgrade Level	197	166	178	172	1.69	31.1	1.29	2.7	12.1



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W00922

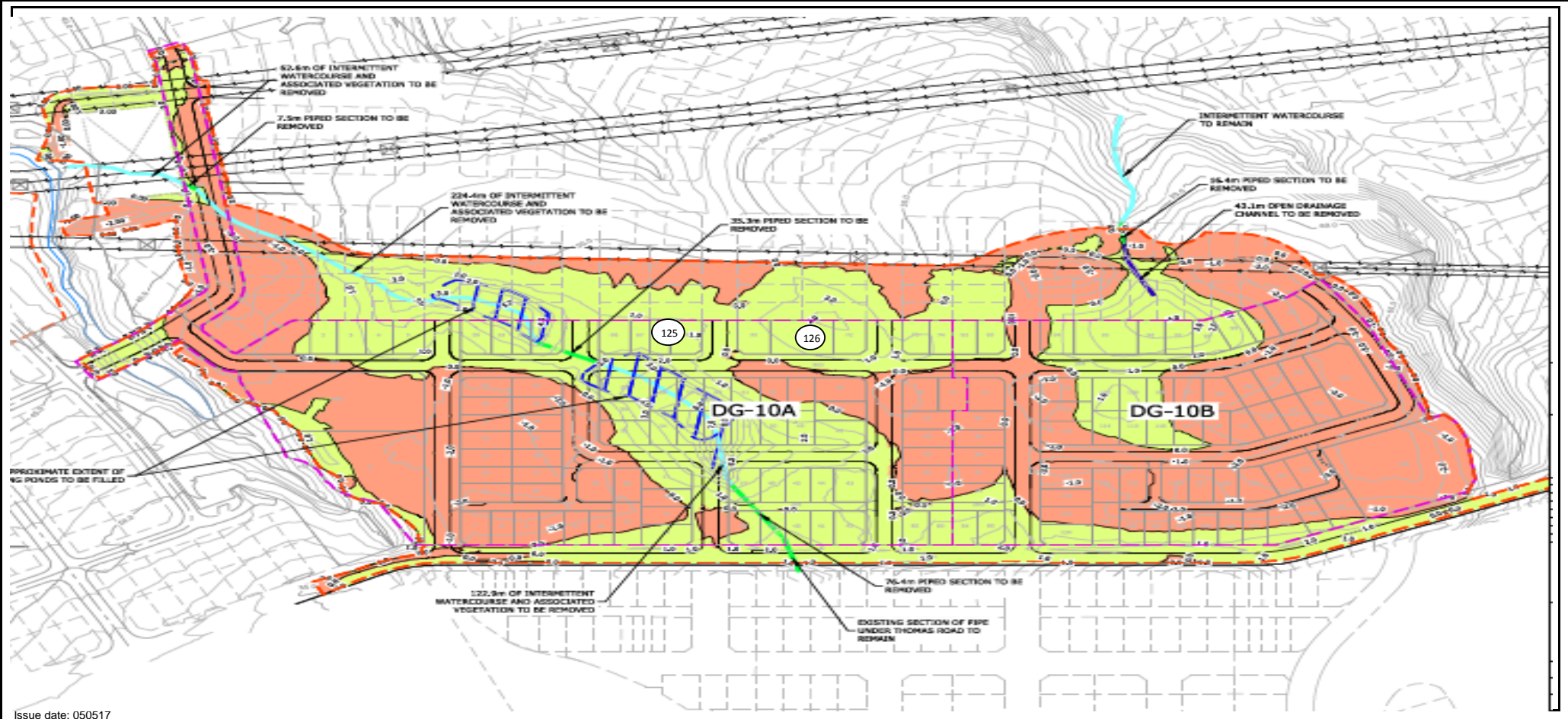
**Page No:** 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS

**Date tested:** 09.03.18



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> <p>Approved Signatory: Cesar Pura</p> <p>Issue date: 16/03/2018</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
12/03/2018	ETAM18W00993	BS	127	Fill	Silty CLAY	General Fill	1770419	5905252	-	150	(Retest of Test No. 126)	191	191	UTP	UTP	1.74	35.8	1.28	2.7	6.8
12/03/2018	ETAM18W00993	BS	128	Fill	Silty CLAY	General Fill	1770387	5905269	-	150	(Retest of Test No. 121)	159	159	159	159	1.72	31.3	1.31	2.7	10.3
12/03/2018	ETAM18W00993	BS	129	Fill	Silty CLAY	Pond B	1770381	5905265	-	150	(Retest of Test No. 123)	UTP	UTP	UTP	UTP	1.83	21.3	1.51	2.7	11.9
12/03/2018	ETAM18W00993	BS	130	Fill	Silty CLAY	Pond B	1770369	5905278	-	150	(Retest of Test No. 124)	UTP	UTP	UTP	UTP	1.74	23.4	1.41	2.7	15.1

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W00993

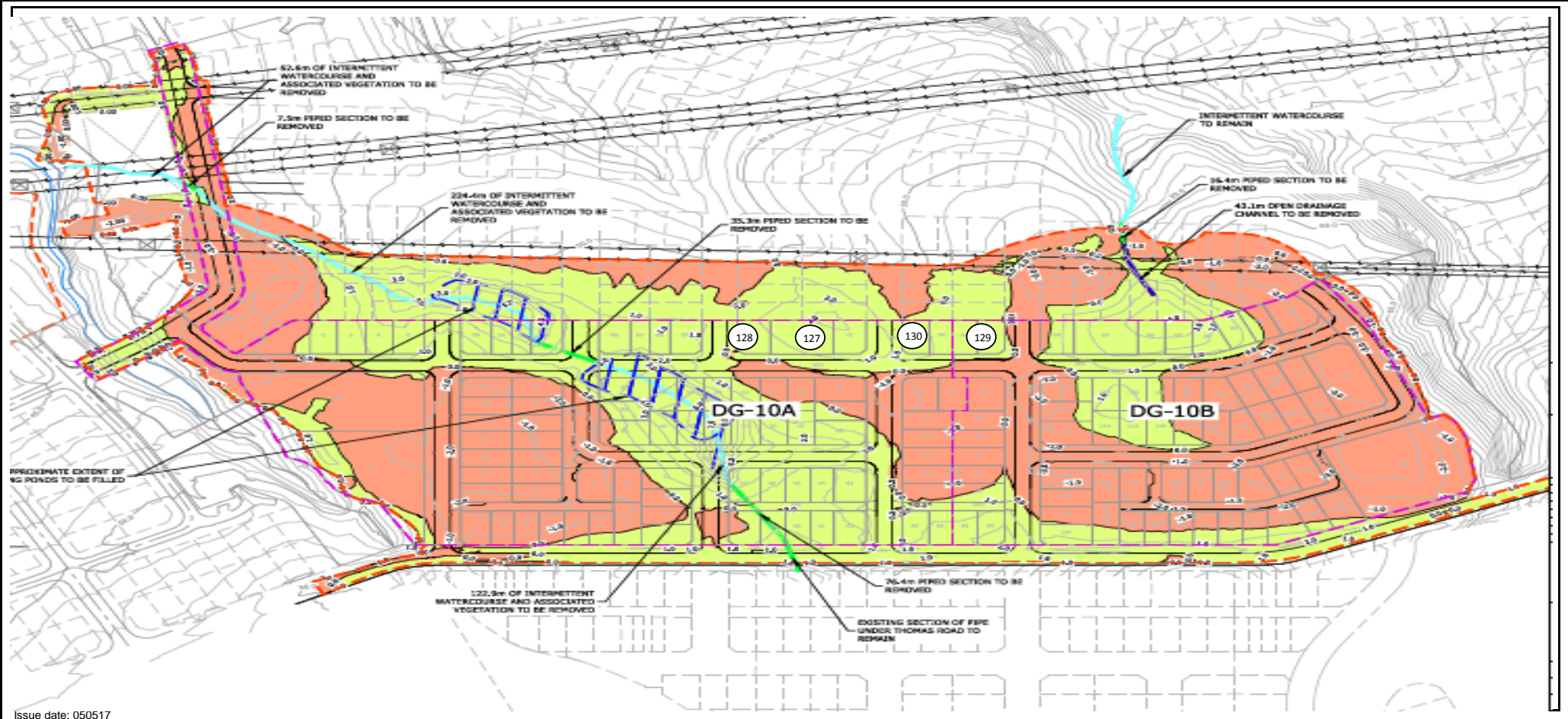
**Page No:** 2 of 2



**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS

**Date tested:** 12.03.18



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush	<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="text-align: center; padding: 10px;">  <div style="display: inline-block; vertical-align: middle; margin-left: 10px;">           Tests indicated as not accredited are outside the scope of the laboratory's accreditation         </div> </div> <div style="text-align: right; padding-top: 20px;">   <b>Approved Signatory:</b> Cesar Pura  <b>Issue date:</b> 21/03/2018       </div>																																																																																	
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																																																																																		
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #e6f2ff;"> <th>Date</th> <th>Work Order No: ETAM...</th> <th>Tested by</th> <th>Test No.</th> <th>Layer</th> <th>Material tested</th> <th>Location</th> <th>Easting</th> <th>Northing</th> <th>RL</th> <th>Probe Test Depth (mm) FL = Finished level</th> <th>Comments</th> <th colspan="4">Field Shear Strength in kPa UTP = Unable to penetrate</th> <th>Wet Density (t/m<sup>3</sup>)</th> <th>Oven Water Content (%)</th> <th>Dry Density (tm<sup>3</sup>)</th> <th>Solid Density</th> <th>Air Voids (%)</th> </tr> </thead> <tbody> <tr> <td>15/03/2018</td> <td>ETAM18W01105</td> <td>BS</td> <td>131</td> <td>Fill</td> <td>Silty CLAY</td> <td>Old Pond</td> <td>1770272</td> <td>5905364</td> <td>-</td> <td>150</td> <td>At Finished Level</td> <td>UTP</td> <td>UTP</td> <td>213</td> <td>213</td> <td>1.75</td> <td>24.8</td> <td>1.40</td> <td>2.7</td> <td>13</td> </tr> <tr> <td>15/03/2018</td> <td>ETAM18W01105</td> <td>BS</td> <td>132</td> <td>Fill</td> <td>Silty CLAY</td> <td>Old Pond</td> <td>1770228</td> <td>5905393</td> <td>-</td> <td>150</td> <td>At Finished Level</td> <td>213</td> <td>213</td> <td>213</td> <td>UTP</td> <td>1.77</td> <td>26.0</td> <td>1.41</td> <td>2.7</td> <td>11</td> </tr> </tbody> </table>																				Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)	15/03/2018	ETAM18W01105	BS	131	Fill	Silty CLAY	Old Pond	1770272	5905364	-	150	At Finished Level	UTP	UTP	213	213	1.75	24.8	1.40	2.7	13	15/03/2018	ETAM18W01105	BS	132	Fill	Silty CLAY	Old Pond	1770228	5905393	-	150	At Finished Level	213	213	213	UTP	1.77	26.0	1.41	2.7	11
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)																																																														
15/03/2018	ETAM18W01105	BS	131	Fill	Silty CLAY	Old Pond	1770272	5905364	-	150	At Finished Level	UTP	UTP	213	213	1.75	24.8	1.40	2.7	13																																																														
15/03/2018	ETAM18W01105	BS	132	Fill	Silty CLAY	Old Pond	1770228	5905393	-	150	At Finished Level	213	213	213	UTP	1.77	26.0	1.41	2.7	11																																																														



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W01105

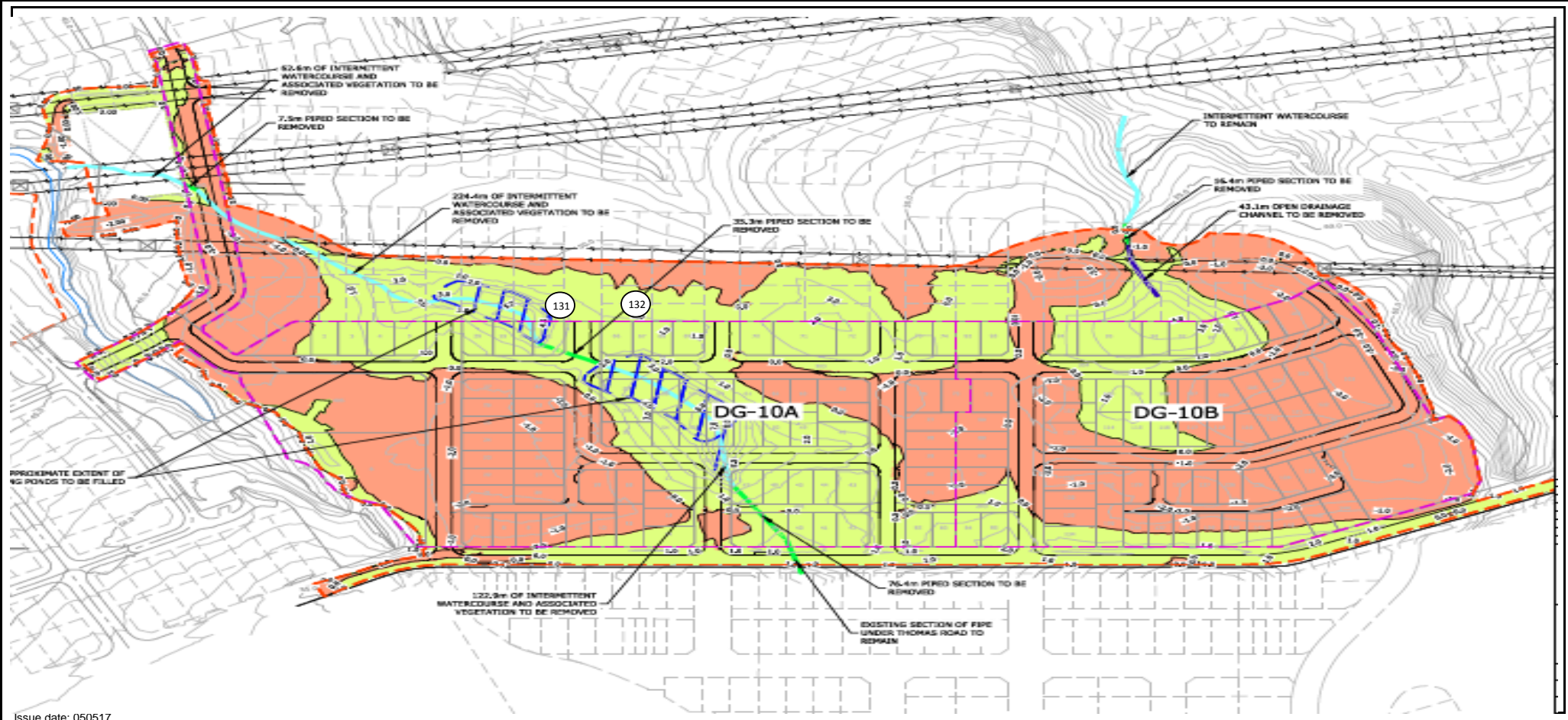
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush



**Location:** As below

**Tested by:** BS

**Date tested:** 15.03.18





<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center; justify-content: space-between;"> <div style="text-align: center;">  <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> </div> <div style="text-align: right;">   <b>Approved Signatory:</b> Cesar Pura  <b>Issue date:</b> 24/03/2018         </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
16/03/2018	ETAM18W01109	BS	133	Fill	Silty CLAY	Old Gully	1770273	5905266	-	150	At Finished Level	220+	220+	220+	220+	2.10	30.4	1.61	2.7	0.0
16/03/2018	ETAM18W01109	BS	134	Fill	Silty CLAY	Eastern Transmission	1770730	5905231	-	150	1.0m to Subgrade Level	116	130	127	123	1.92	31.3	1.46	2.7	0.0

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W01109

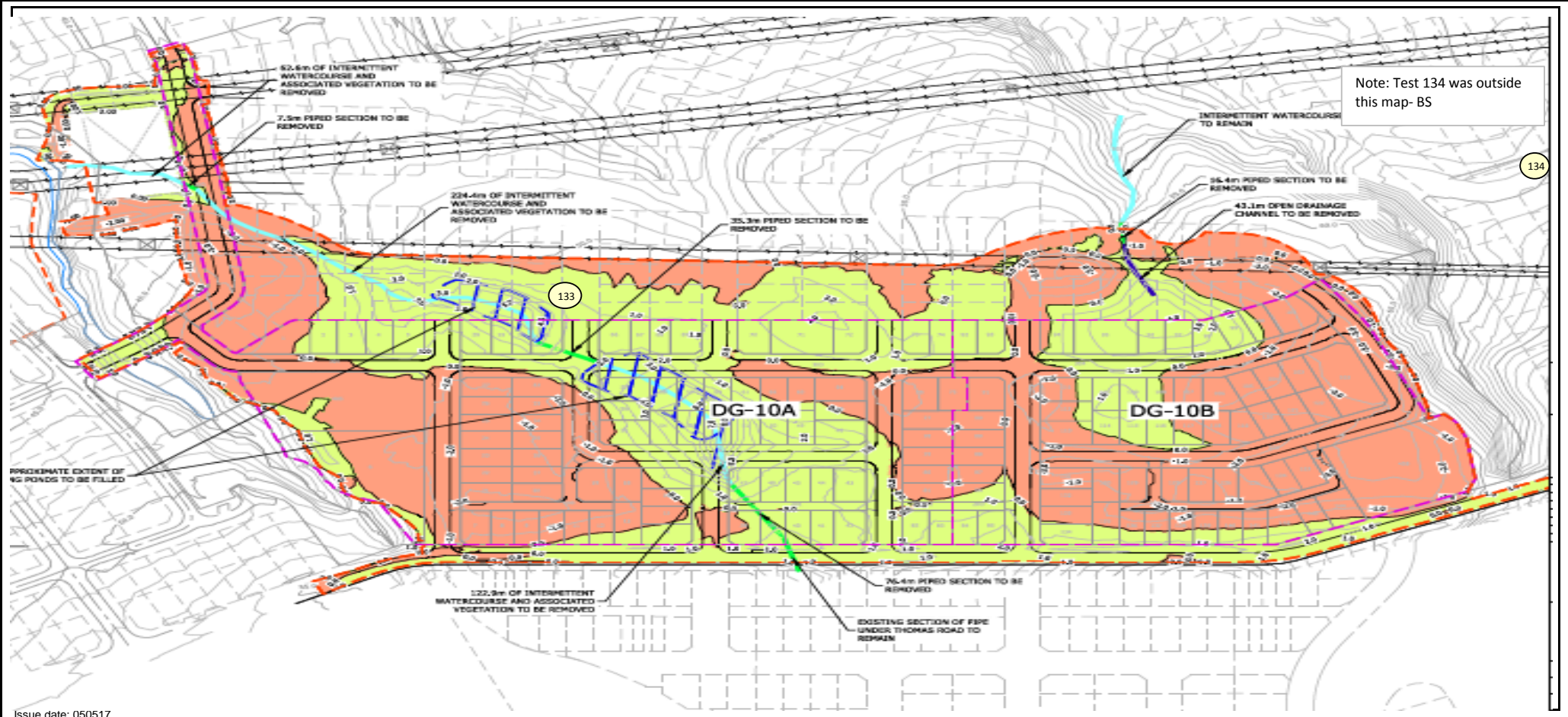
**Page No:** 2 of 2



**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS

**Date tested:** 16.03.18



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center; justify-content: space-between;"> <div style="text-align: center;">   <b>IANZ</b>          ACCREDITED LABORATORY       </div> <div>         Tests indicated as          not accredited are outside          the scope of the          laboratory's accreditation       </div> <div style="text-align: right;">           Approved Signatory: Cesar Pura          Issue date: 26/03/2018       </div> </div>										
<b>Test method:</b> Test Methods in accordance with: Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Density Calculations (in accordance with NZS 4402:1986 Tests 4.1.1.5(b)). Please note that Air Void calculations are not IANZ endorsed as part of this report.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm) FL = Finished level	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density	Air Voids (%)
19/03/2018	ETAM18W01163	BS	135	Fill	Silty CLAY	Eastern Lot Undercut	1770528	5905120	-	150	Undercut Area	220+	220+	220+	220+	1.72	41.2	1.21	2.7	5.0
19/03/2018	ETAM18W01163	BS	136	Fill	Silty CLAY	Eastern Lot Undercut	1770554	5905113	-	150	Undercut Area	UTP	UTP	191	191	1.88	26.9	1.48	2.7	5.2
19/03/2018	ETAM18W01163	BS	137	Fill	Silty CLAY	Eastern Transmission	1770735	5905229	-	150	800mm to Subgrade Level	191	191	220+	220+	1.90	29.8	1.46	2.7	2.3
19/03/2018	ETAM18W01163	BS	138	Fill	Silty CLAY	Eastern Transmission	1770730	5905231	-	150	(Retest of Test No. 134)	191	191	191	191	1.87	29.5	1.44	2.7	3.9



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W01163

**Page No:** 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS

**Date tested:** 19.03.18



<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA											
<b>Address</b> PO Box 8261, Symonds Street, Auckland 1150										<b>Page:</b> 1 of 2											
<b>Attention:</b> Ray Berry										<div><div><div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div></div><div><div>Approved Signatory:</div><div>Cesar Pura</div></div><div><div>Issue date:</div><div>27/03/2018</div></div></div>											
<b>c.c:</b> -																					
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush																					
<b>Location:</b> Flat Bush																					
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																					
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density (Assumed)	Air Voids (%)	
20/03/2018	ETAM18W01167	BS	139	Fill	Silty CLAY	Eastern Transmission	1770706	5905244	-	150	500mm to Subgrade Level	191	191	UTP	UTP	1.83	31.2	1.40	2.7	4.6	
20/03/2018	ETAM18W01167	BS	140	Fill	Silty CLAY	Eastern Transmission	1770731	5905228	-	150	500mm to Subgrade Level	159	159	208	197	1.79	36.9	1.31	2.7	3.4	



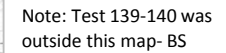
**Project No: 773-ETAM00525AA**



Work Order No: ETAM18W01167

2 of 2

Tested by: BS

Date tested: 20.03.18



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush	<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center; justify-content: space-between; padding: 10px;"> <div style="text-align: center;">  <p><b>IANZ</b> ACCREDITED LABORATORY</p> </div> <div style="text-align: center;"> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> </div> <div style="text-align: right;">   <p>Approved Signatory: Cesar Pura Issue date: 28/03/2018</p> </div> </div>																																																																																	
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																																																																																		
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #e6f2ff;"> <th>Date</th> <th>Work Order No: ETAM...</th> <th>Tested by</th> <th>Test No.</th> <th>Layer</th> <th>Material tested</th> <th>Location</th> <th>Easting</th> <th>Northing</th> <th>RL</th> <th>Probe Test Depth (mm)</th> <th>Comments</th> <th colspan="4">Field Shear Strength in kPa UTP = Unable to penetrate</th> <th>Wet Density (t/m<sup>3</sup>)</th> <th>Oven Water Content (%)</th> <th>Dry Density (tm<sup>3</sup>)</th> <th>Solid Density (Assumed)</th> <th>Air Voids (%)</th> </tr> </thead> <tbody> <tr> <td>21/03/2018</td> <td>ETAM18W01184</td> <td>JJ</td> <td>141</td> <td>Fill</td> <td>Silty CLAY</td> <td>Thomas Road front Undercut</td> <td>1770312</td> <td>5905144</td> <td>-</td> <td>150</td> <td>1.2m to Finished Level</td> <td>UTP</td> <td>UTP</td> <td>UTP</td> <td>170</td> <td>1.73</td> <td>30.8</td> <td>1.32</td> <td>2.7</td> <td>10</td> </tr> <tr> <td>21/03/2018</td> <td>ETAM18W01184</td> <td>JJ</td> <td>142</td> <td>Fill</td> <td>Silty CLAY</td> <td>Thomas Road front Undercut</td> <td>1770285</td> <td>5905156</td> <td>-</td> <td>150</td> <td>1.2m to Finished Level</td> <td>UTP</td> <td>UTP</td> <td>UTP</td> <td>UTP</td> <td>1.71</td> <td>31.2</td> <td>1.30</td> <td>2.7</td> <td>11</td> </tr> </tbody> </table>																				Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density (Assumed)	Air Voids (%)	21/03/2018	ETAM18W01184	JJ	141	Fill	Silty CLAY	Thomas Road front Undercut	1770312	5905144	-	150	1.2m to Finished Level	UTP	UTP	UTP	170	1.73	30.8	1.32	2.7	10	21/03/2018	ETAM18W01184	JJ	142	Fill	Silty CLAY	Thomas Road front Undercut	1770285	5905156	-	150	1.2m to Finished Level	UTP	UTP	UTP	UTP	1.71	31.2	1.30	2.7	11
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density (Assumed)	Air Voids (%)																																																														
21/03/2018	ETAM18W01184	JJ	141	Fill	Silty CLAY	Thomas Road front Undercut	1770312	5905144	-	150	1.2m to Finished Level	UTP	UTP	UTP	170	1.73	30.8	1.32	2.7	10																																																														
21/03/2018	ETAM18W01184	JJ	142	Fill	Silty CLAY	Thomas Road front Undercut	1770285	5905156	-	150	1.2m to Finished Level	UTP	UTP	UTP	UTP	1.71	31.2	1.30	2.7	11																																																														

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W01184

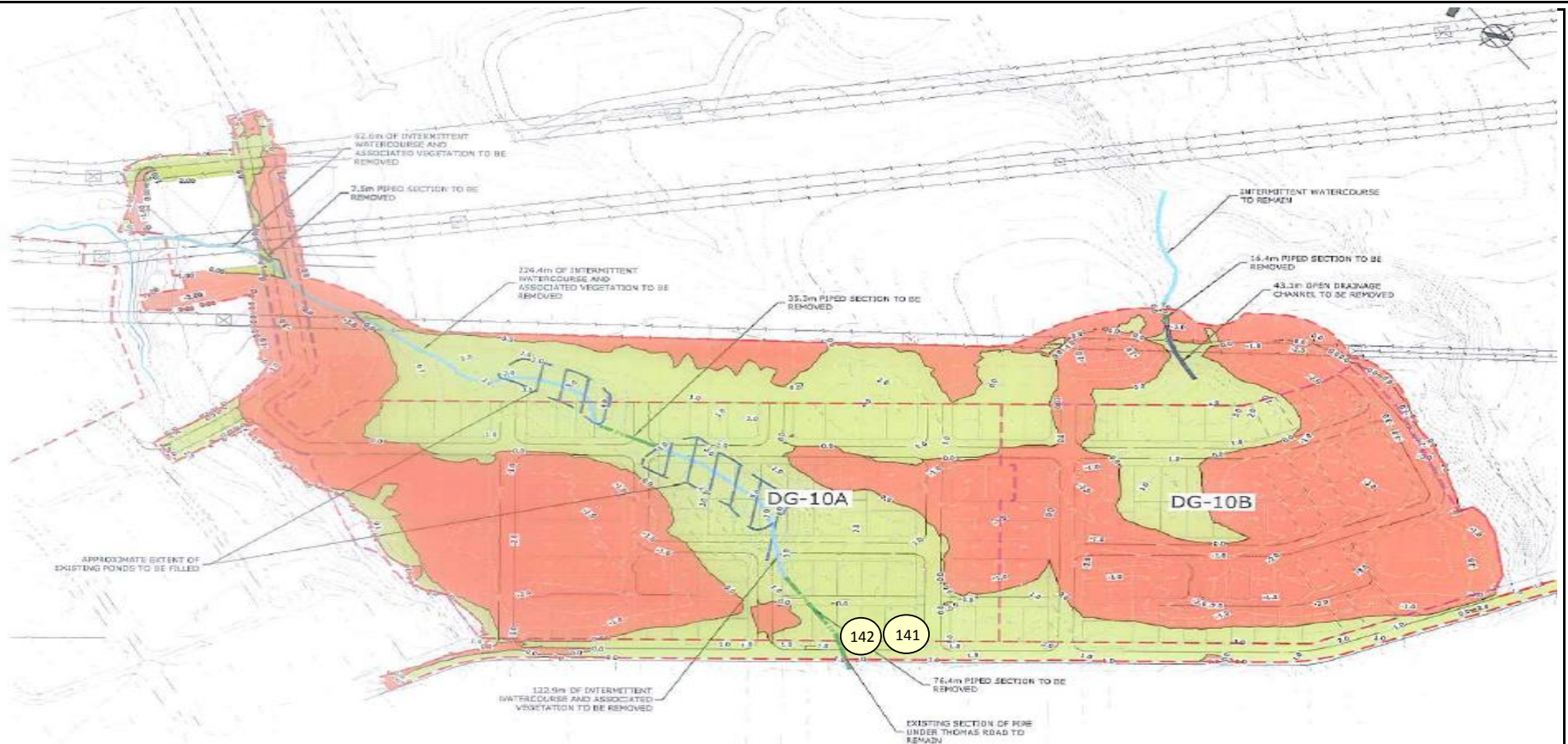
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush



**Location:** As below

**Tested by:** JJ

**Date tested:** 21.03.18





<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush	<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center; justify-content: space-between; padding-top: 10px;"> <div style="text-align: center;">  <p><b>IANZ</b> ACCREDITED LABORATORY</p> </div> <div style="text-align: center;"> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> </div> <div style="text-align: right;">   <p>Approved Signatory: Cesar Pura Issue date: 28/03/2018</p> </div> </div>																			
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density (Assumed)	Air Voids (%)
22/03/2018	ETAM18W01189	BS	143	Fill	Silty CLAY	Refer to plan	1770302	5905140	-	150		UTP	UTP	UTP	UTP	1.87	31.1	1.42	2.7	2.9
22/03/2018	ETAM18W01189	BS	144	Fill	Silty CLAY	Refer to plan	1770482	5905201	-	150	-	220+	220+	220+	220+	1.65	34.0	1.23	2.7	12
22/03/2018	ETAM18W01189	BS	145	Fill	Silty CLAY	Eastern Transmission	1770714	5905227	-	150	-	159	159	159	197	1.64	41.4	1.16	2.7	9.2
22/03/2018	ETAM18W01189	BS	146	Fill	Silty CLAY	Old Pond	1770272	5905364	-	150	At Finished Level (Retest of Test No. 131)	UTP	UTP	UTP	UTP	1.66	34.0	1.24	2.7	12
22/03/2018	ETAM18W01189	BS	147	Fill	Silty CLAY	Old Pond	1770228	5905393	-	150	At Finished Level (Retest of Test No. 132)	UTP	UTP	UTP	UTP	1.79	20.7	1.48	2.7	14
22/03/2018	ETAM18W01189	BS	148	Fill	Silty CLAY	General Fill	1770387	5905269	-	150	Retest of Test No. 128	UTP	UTP	UTP	UTP	1.70	34.8	1.26	2.7	9.7
22/03/2018	ETAM18W01189	BS	149	Fill	Silty CLAY	Pond B	1770381	5905265	-	150	Retest of Test No. 129	UTP	UTP	UTP	UTP	1.70	28.1	1.33	2.7	14
22/03/2018	ETAM18W01189	BS	150	Fill	Silty CLAY	Pond B	1770369	5905278	-	150	Retest of Test No. 130	UTP	UTP	UTP	UTP	1.74	24.6	1.39	2.7	14

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W01189

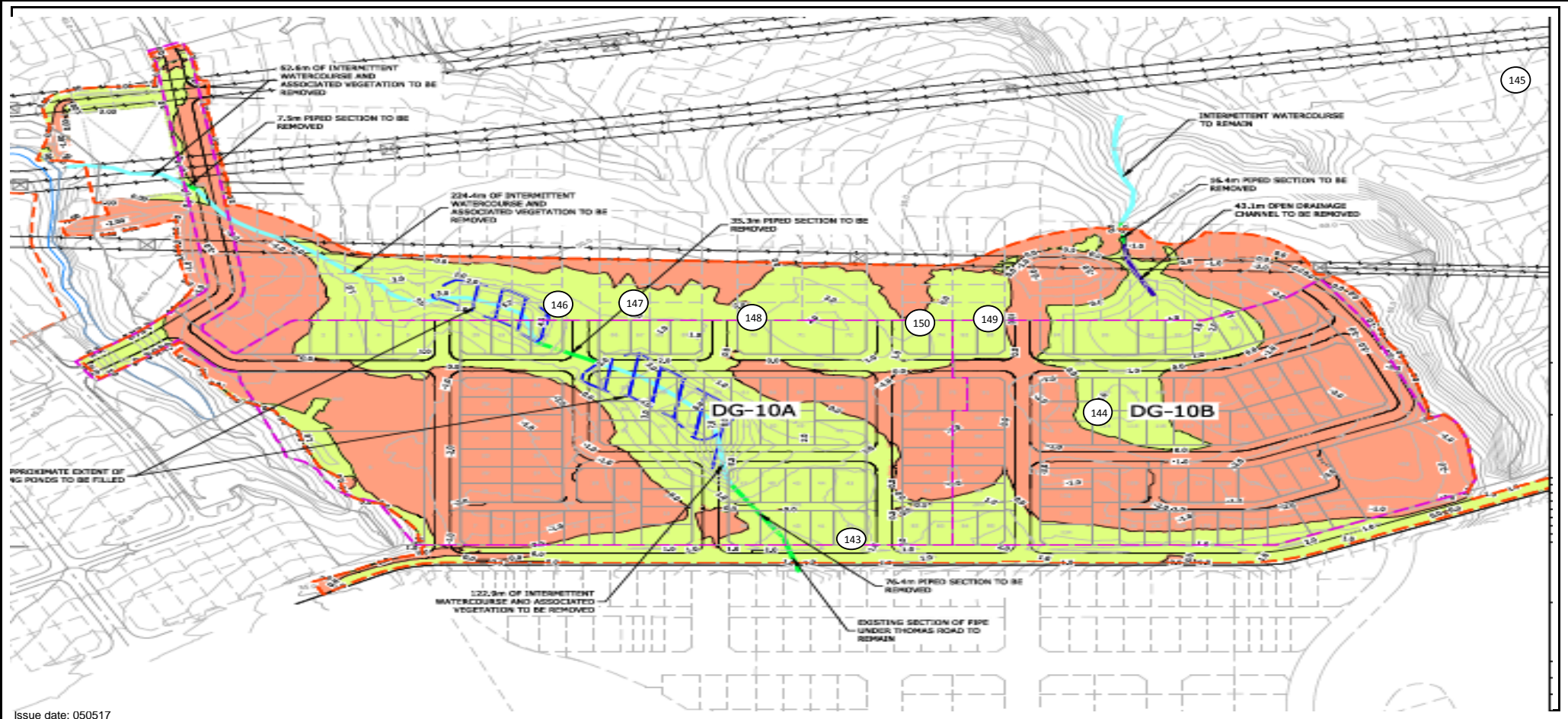
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush


**Location:** As below

**Tested by:** BS

**Date tested:** 22.03.18





<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2  <b>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</b> <b>Approved Signatory:</b> Cesar Pura <b>Issue date:</b> 29/03/2018										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (t/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (tm <sup>3</sup> )	Solid Density (Assumed)	Air Voids (%)
23/03/2018	ETAM18W01268	BS	151	Fill	Silty CLAY	Eastern Transmission	1770709	5905231	-	150	200mm to Subgrade Level	UTP	UTP	UTP	191	1.65	31.8	1.25	2.7	13.6
23/03/2018	ETAM18W01268	BS	152	Fill	Silty CLAY	Lot Fill	1770506	5905194	-	150	700mm to Subgrade Level	220+	220+	UTP	UTP	1.62	37.3	1.18	2.7	12.2
23/03/2018	ETAM18W01268	BS	153	Fill	Silty CLAY	Lot Fill	1770486	5905199	-	150	700mm to Subgrade Level	UTP	UTP	UTP	UTP	1.62	31.5	1.23	2.7	15.6

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W01268

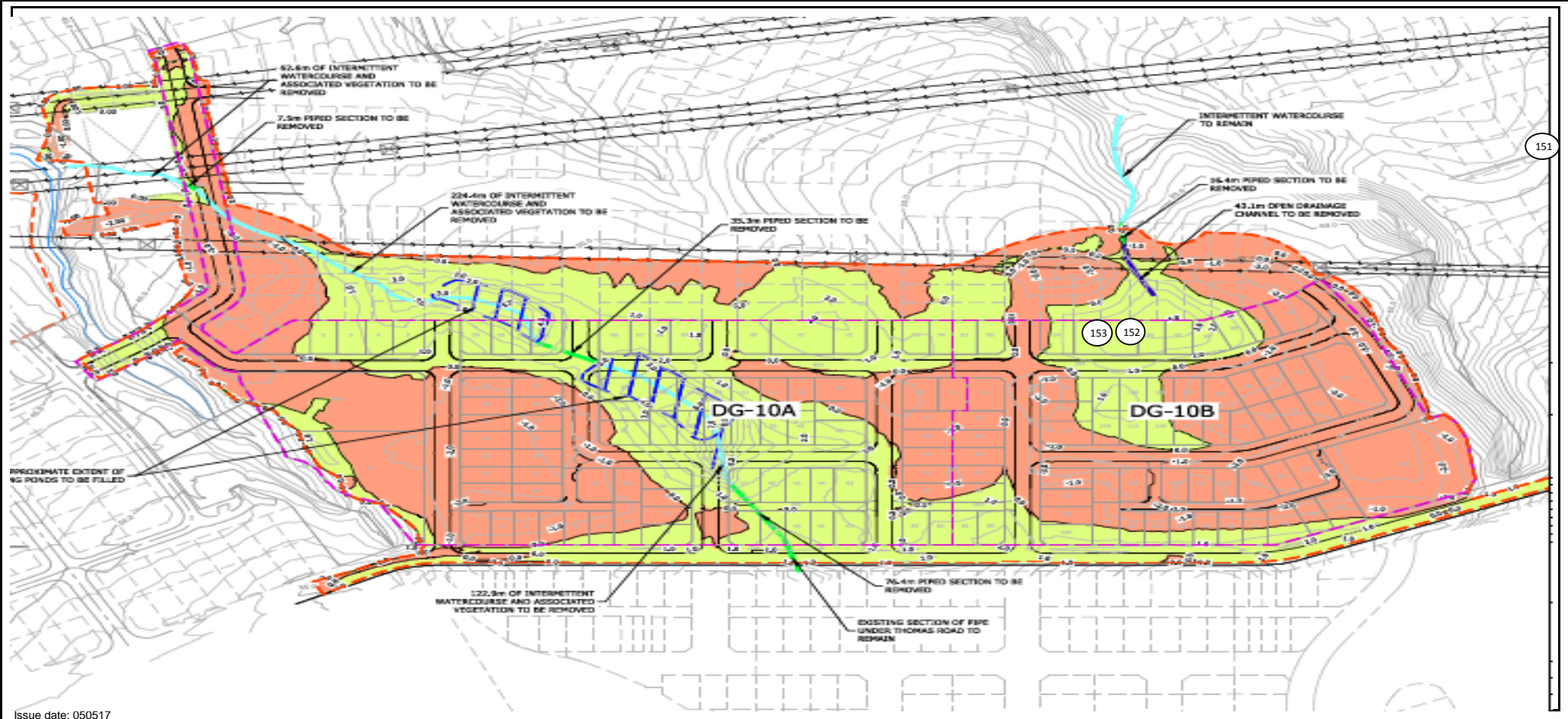
**Page No:** 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS

**Date tested:** 23.03.18



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> <p>Approved Signatory: Cesar Pura</p> <p>Issue date: 3/04/2018</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Assumed)	Air Voids (%)
26/03/2018	ETAM18W01271	BS	154	Fill	Silty CLAY	Thomas Road Frontage	1770290	5905148	-	150	-	220+	220+	UTP	UTP	1.78	38.1	1.29	2.7	3.3

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W01271

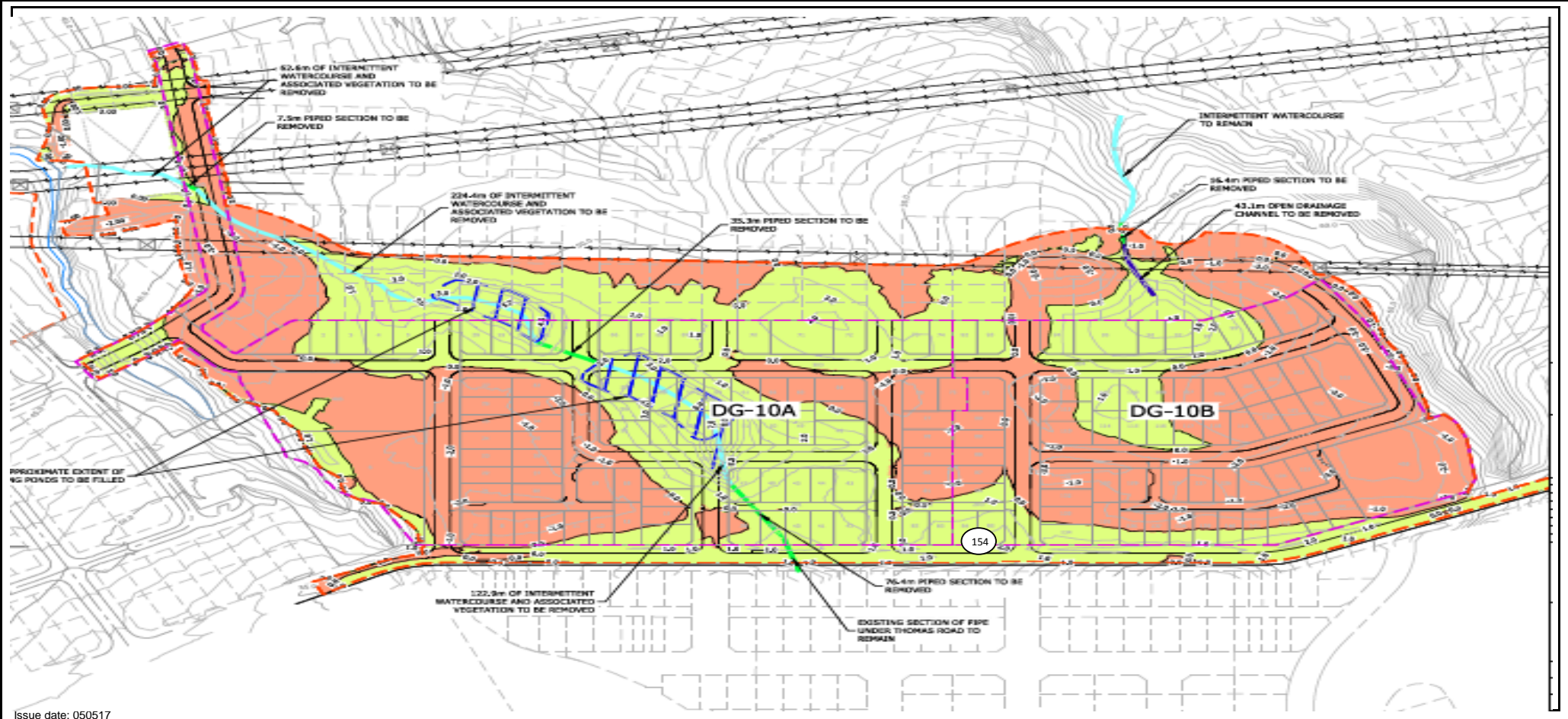
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush


**Location:** As below

**Tested by:** BS

**Date tested:** 26.03.18





<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA										
<b>Address</b> PO Box 8261, Symonds Street, Auckland 1150										<b>Page:</b> 1 of 2										
<b>Attention:</b> Ray Berry										<div><div></div><div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div></div> <div><div>Approved Signatory:</div><div>Cesar Pura</div></div> <div><div>Issue date:</div><div>3/04/2018</div></div>										
<b>c.c:</b> -																				
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush																				
<b>Location:</b> Flat Bush																				
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Assumed)	Air Voids (%)
27/03/2018	ETAM18W01297	BS/MA	155	Fill	Silty CLAY	Lot Pond A	1770475	5905209	-	150	At Finished Level	UTP	UTP	UTP	217	1.76	37.6	1.28	2.7	4.5
27/03/2018	ETAM18W01297	BS/MA	156	Fill	Silty CLAY	Lot Pond A	1770494	5905198	-	150	At Finished Level	116	100	132	81	1.60	41.3	1.13	2.7	11



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W01297

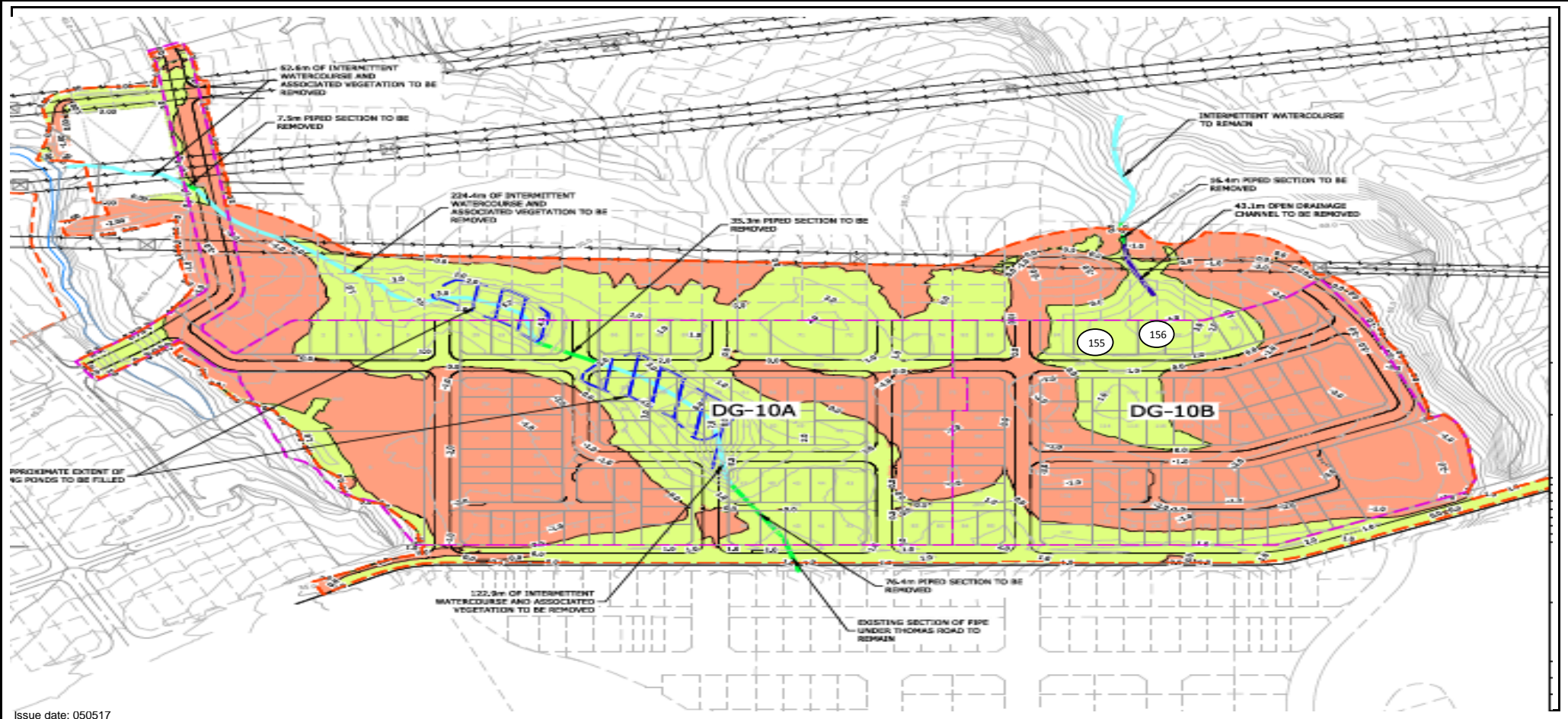
**Page No:** 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS/MA

**Date tested:** 27.03.18



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c.:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2  Tests indicated as not accredited are outside the scope of the laboratory's accreditation Approved Signatory: Cesar Pura Issue date: 3/04/2018										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Assumed)	Air Voids (%)
28/03/2018	ETAM18W01315	JJ/MA	157	Fill	Silty CLAY	Eastern Transmission Corridor	1770746	5905239	-	150	At Finished Level	139	UTP	150	154	1.90	29.7	1.46	2.7	2.5
28/03/2018	ETAM18W01315	JJ/MA	158	Fill	Silty CLAY	Eastern Transmission Corridor	1770709	5905233	-	150	At Finished Level	188	161	UTP	UTP	1.82	34.9	1.35	2.7	3.0

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W01315

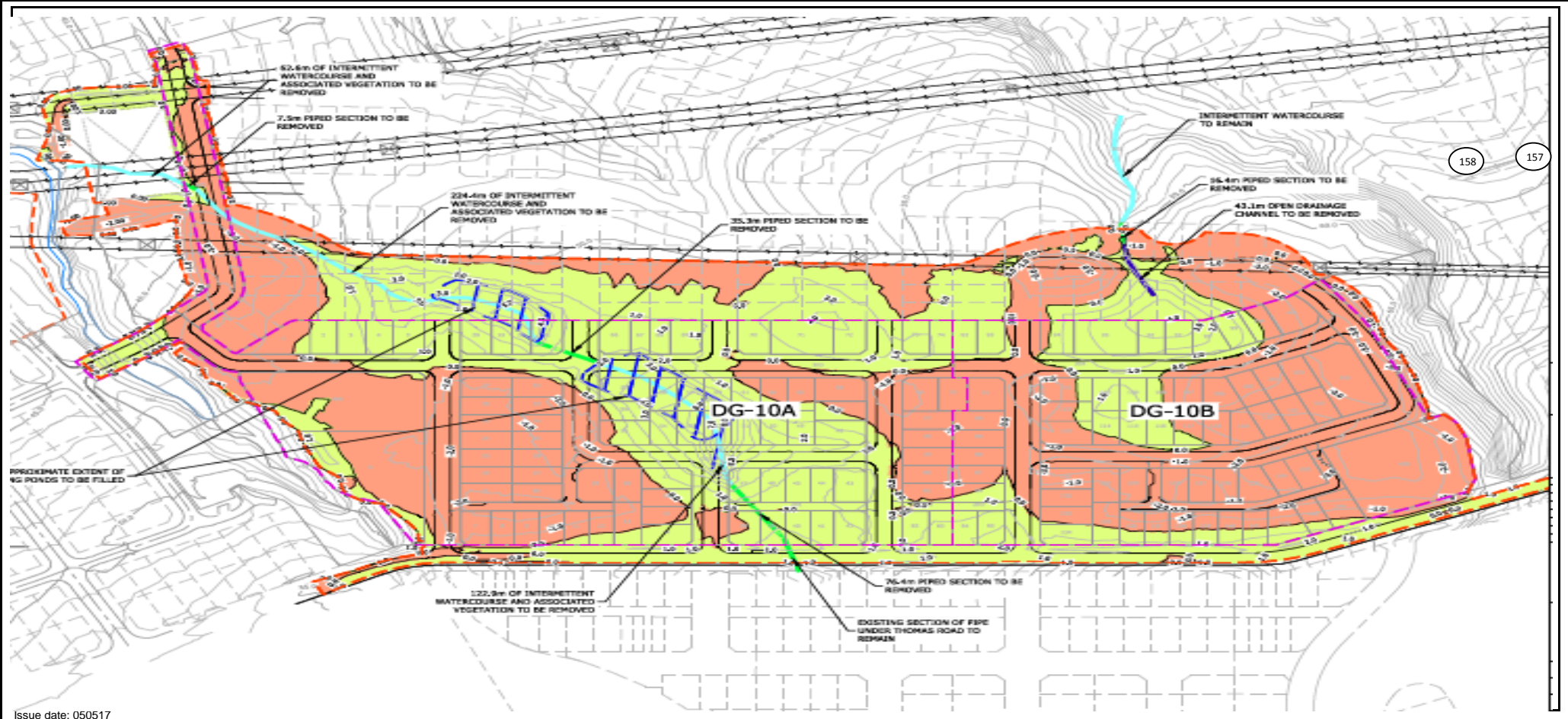
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ/MA

**Date tested:** 28.03.18



<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA											
<b>Address</b> PO Box 8261, Symonds Street, Auckland 1150										<b>Page:</b> 1 of 2											
<b>Attention:</b> Ray Berry										<div><div><div>IANZ</div><div>ACCREDITED LABORATORY</div></div><div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div></div> <div><div>Approved Signatory:</div><div>Cesar Pura</div></div> <div><div>Issue date:</div><div>9/04/2018</div></div>											
<b>c.c:</b> -																					
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush																					
<b>Location:</b> Flat Bush																					
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																					
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)	
3/04/2018	ETAM18W01367	FP/MA	159	Fill	Silty CLAY	Lot Fill	1770467	5905225	-	150	At Finished Level	UTP	UTP	UTP	UTP	1.86	32.3	1.40	2.59	0.3	
3/04/2018	ETAM18W01367	FP/MA	160	Fill	Silty CLAY	Lot Fill	1770488	5905210	-	150	At Finished Level	UTP	UTP	UTP	UTP	1.93	37.3	1.40	2.59	0	



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W01367

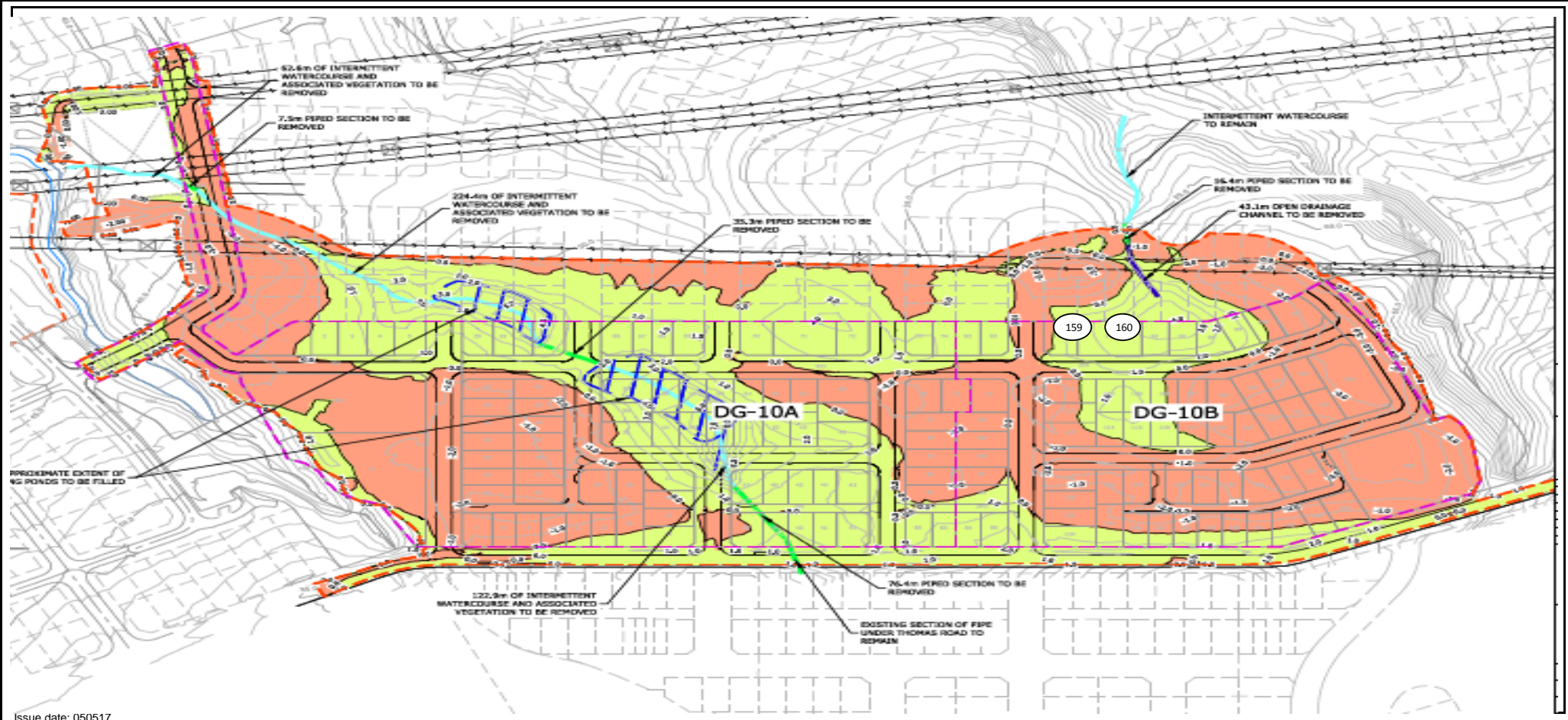
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush


**Location:** As below

**Tested by:** FP/MA

**Date tested:** 03.04.18





<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush  <b>Location:</b> Flat Bush											<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div><div><div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div></div><div>Approved Signatory: Cesar Pura Issue date: 10/04/2018</div></div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																					
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)	
4/04/2018	ETAM18W01384	MA/FC	161	Fill	Silty CLAY	Thomas Road	1770285	5905154	-	150	-	UTP	UTP	UTP	UTP	1.94	28.3	1.51	2.59	0	
4/04/2018	ETAM18W01384	MA/FC	162	Fill	Silty CLAY	Gully Fill	1770200	5905486	-	150	-	162	214+	UTP	UTP	1.92	29.4	1.48	2.59	0	

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W01384

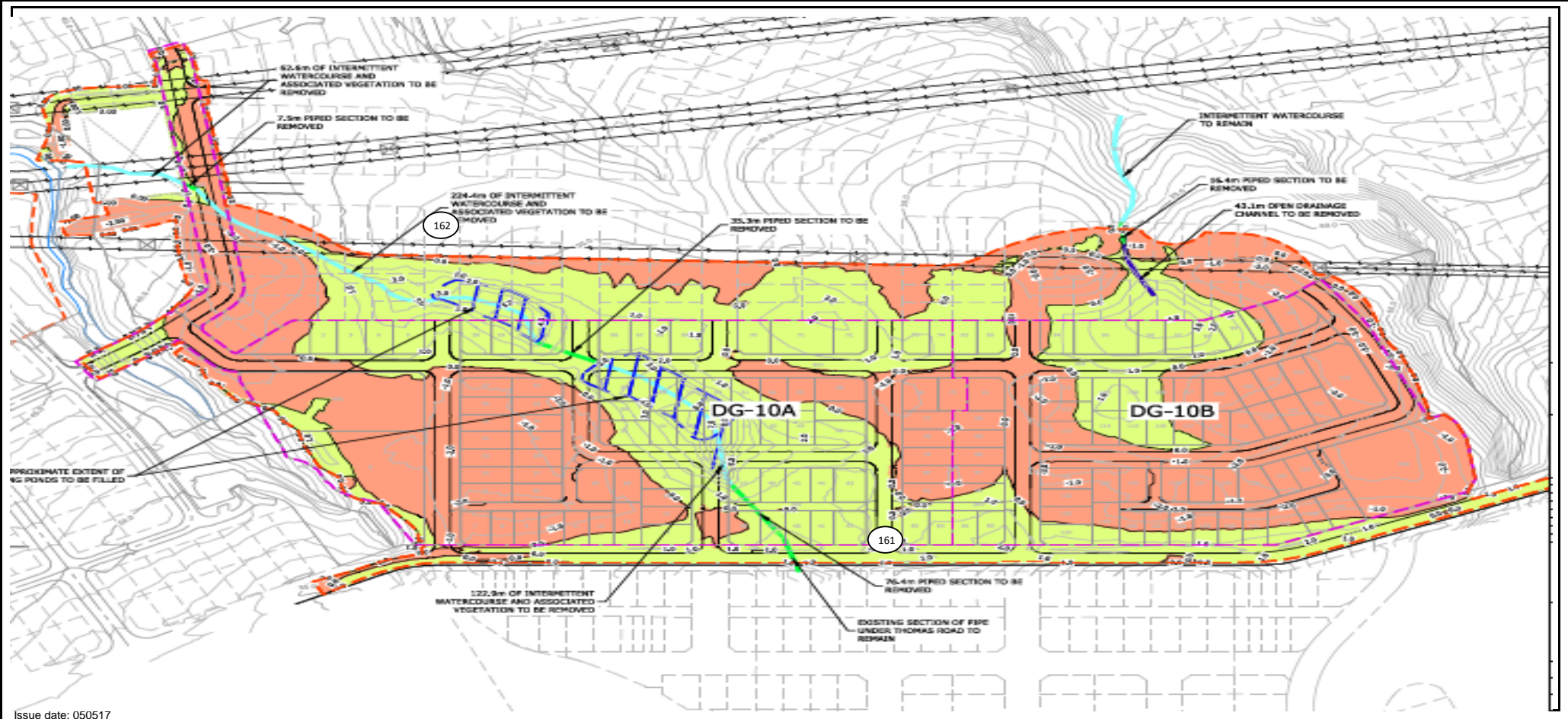
**Page No:** 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** MA & FC

**Date tested:** 04.04.18



<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA										
Address PO Box 8261, Symonds Street, Auckland 1150										Page: 1 of 2										
<b>Attention:</b> Ray Berry										<div><div><div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div></div><div><div>Approved Signatory:</div><div>Cesar Pura</div></div><div><div>Issue date:</div><div>18/04/2018</div></div></div>										
<b>c.c:</b> -																				
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush																				
Location: Flat Bush																				
Test method: Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³)	Air Voids (%)
5/04/2018	ETAM18W01397	MA/CP	163	Fill	Silty CLAY	Gully	1770207	5905471	-	150	~2m below Finished Level	UTP	UTP	UTP	UTP	1.79	36.1	1.32	2.59	1.7
5/04/2018	ETAM18W01397	MA/CP	164	Fill	Silty CLAY	Gully	1770196	5905492	-	150	~2m below Finished Level	152	214+	UTP	UTP	1.80	38.7	1.29	2.59	0

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W01397

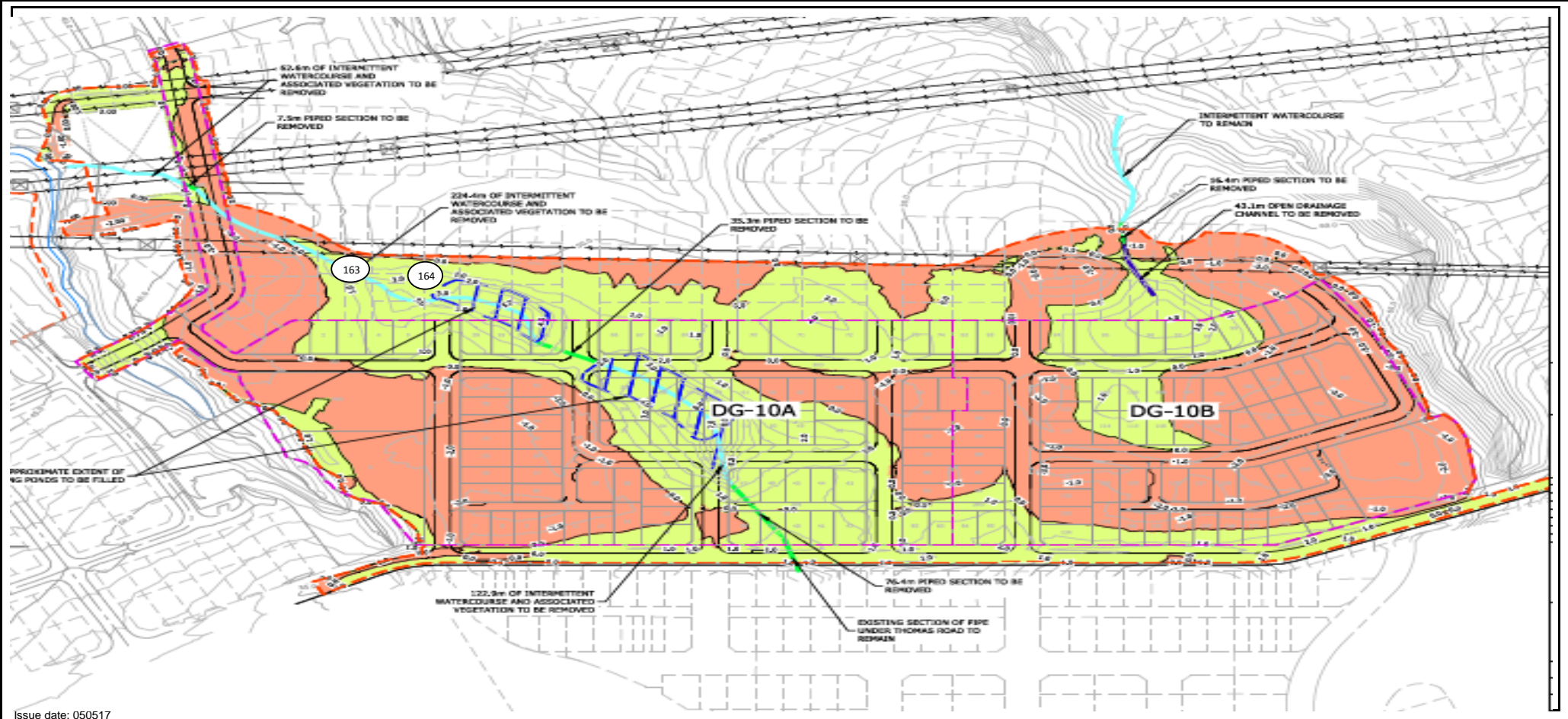
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** MA/CP

**Date tested:** 05.04.18





<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA										
Address PO Box 8261, Symonds Street, Auckland 1150										Page: 1 of 2										
<b>Attention:</b> Ray Berry										<div><div>IANZ</div><div>ACCREDITED LABORATORY</div></div> <div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div> <div><div>Approved Signatory:</div><div>Issue date:</div></div> <div><div>Cesar Pura</div><div>18/04/2018</div></div>										
<b>c.c:</b> -																				
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush																				
Location: Flat Bush																				
Test method: Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
6/04/2018	ETAM18W01453	FP/MA	165	Fill	Silty CLAY	Gully	1770204	5905486	-	150	1.8m below Finished Level	214+	214+	195	UTP	1.84	42.4	1.29	2.59	0



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W01453

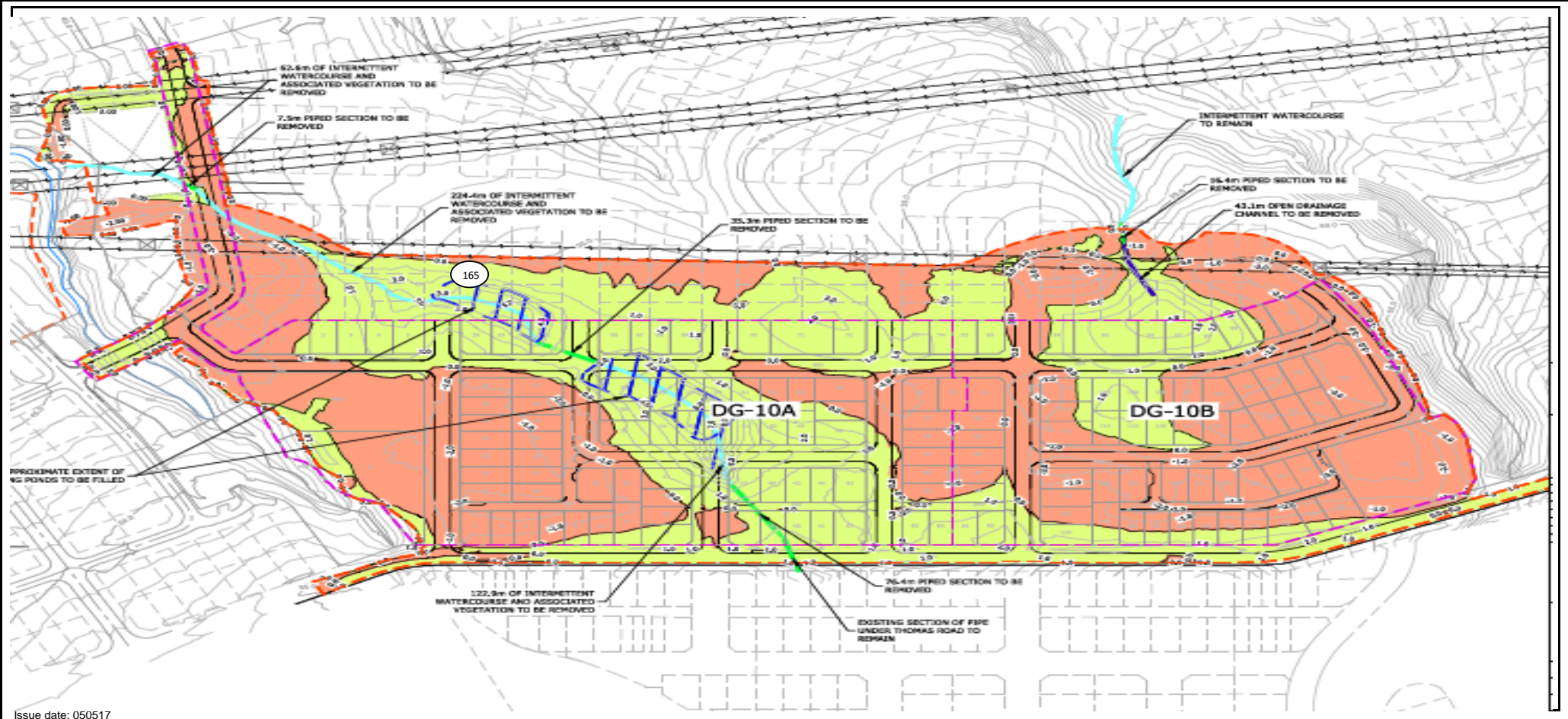
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** FP/MA

**Date tested:** 06.04.18



<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA										
Address PO Box 8261, Symonds Street, Auckland 1150										Page: 1 of 2										
<b>Attention:</b> Ray Berry										<div><div>IANZ</div><div>ACCREDITED LABORATORY</div></div> <div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div> <div><div>Approved Signatory:</div><div>Issue date:</div></div> <div><div>Cesar Pura</div><div>18/04/2018</div></div>										
<b>c.c:</b> -																				
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush																				
Location: Flat Bush																				
Test method: Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
9/04/2018	ETAM18W01454	JJ	166	Fill	Silty CLAY	Western Transmission Gully	1770154	5905582	-	150	Undercut Area	77	86	69	103	1.79	42.0	1.26	2.59	0

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W01454

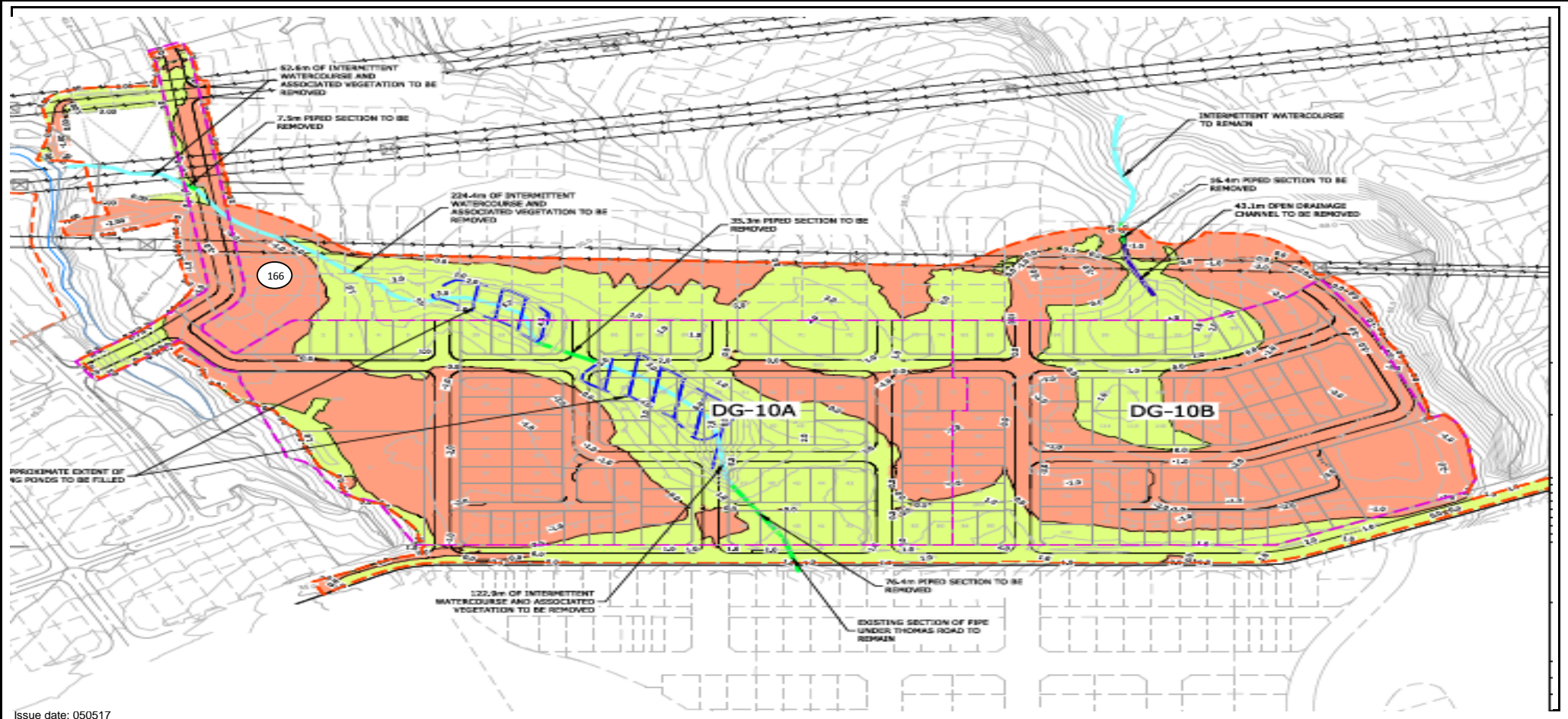
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ

**Date tested:** 09.04.18





Client:

Coffey Services NZ Ltd (Auckland)

Address

PO Box 8261, Symonds Street, Auckland 1150

Attention:

Ray Berry

c.c:

-

Project:

773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

Location:


Flat Bush

PROJECT CODE:

773-ETAM00525AA

Page:

1 of 2



Tests indicated as not accredited are outside the scope of the laboratory's accreditation

Approved Signatory:

Cesar Pura

Issue date:

7/05/2018

Test method:

Test Methods in accordance with: \*Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³)	Air Voids (%)
26/04/2018	ETAM18W01719	MA	167	Fill	CLAY	Gully	2680607	6467174	-	150	1.2m below Finished Level	UTP	UTP	UTP	UTP	1.98	21.3	1.63	2.59	2.4
26/04/2018	ETAM18W01719	MA	168	Fill	CLAY	Gully	2680610	6467156	-	150	1.2m below Finished Level	UTP	UTP	UTP	UTP	1.87	23.9	1.51	2.59	5.5



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W01719

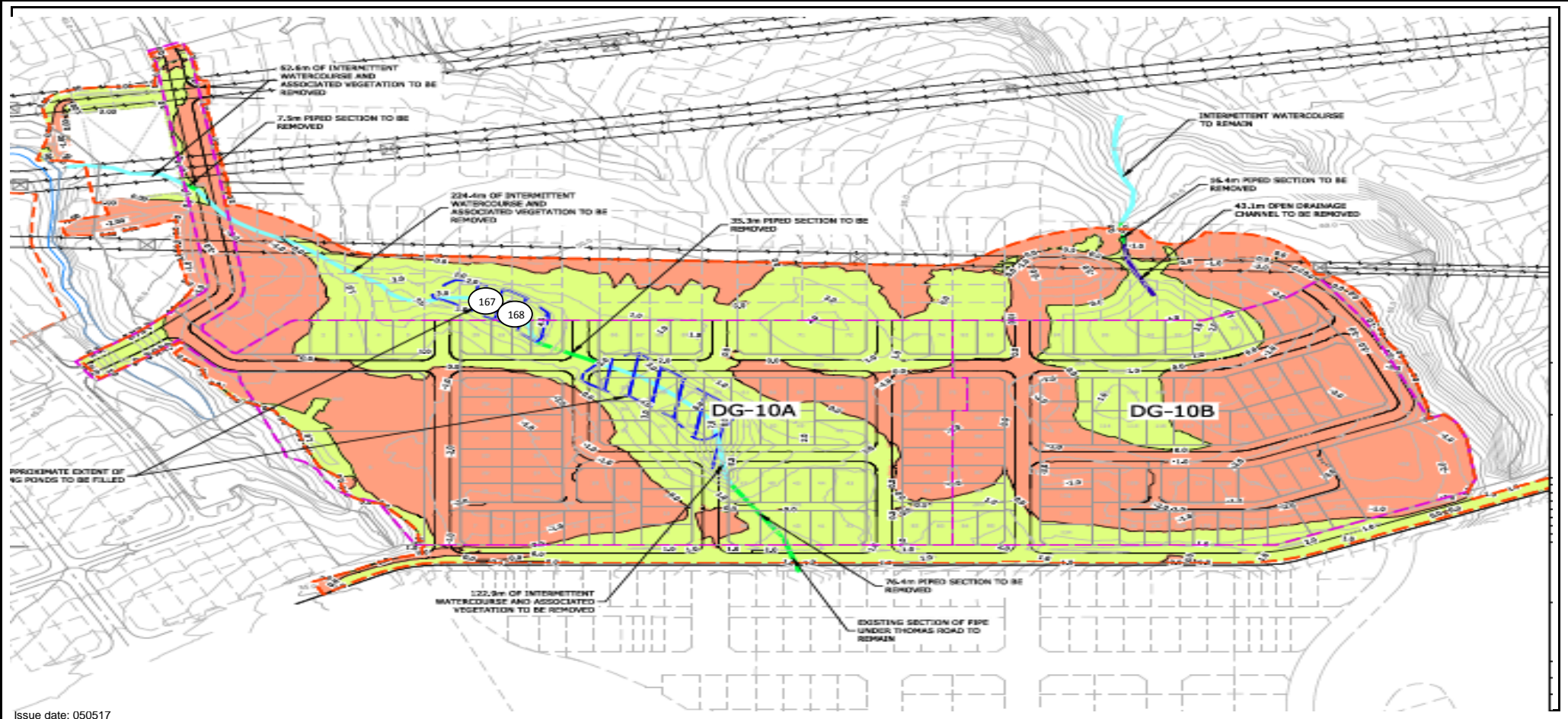
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** MA

**Date tested:** 26.04.18



Client:

Coffey Services NZ Ltd (Auckland)

Address

PO Box 8261, Symonds Street, Auckland 1150

Attention:

Ray Berry

c.c:

-

Project:

773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

Location:


Flat Bush

PROJECT CODE:

773-ETAM00525AA

Page:

1 of 2



Tests indicated as not accredited are outside the scope of the laboratory's accreditation

Approved Signatory:

Cesar Pura

Issue date:

21/05/2018

Test method:

Test Methods in accordance with: \*Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³)	Air Voids (%)
4/05/2018	ETAM18W02047	BS	169	Fill	Silty CLAY	Main Gully	1770197	5905502	-	150	0.5m to Finished Level	178	178	178	170	1.89	19.9	1.58	2.59	8
4/05/2018	ETAM18W02047	BS	170	Fill	Silty CLAY	Main Gully	1770189	5905533	-	150	0.5m to Finished Level	214+	178	178	158	2.00	26.4	1.58	2.59	0
4/05/2018	ETAM18W02047	BS	171	Fill	Silty CLAY	Main Gully	1770167	5905567	-	150	0.5m to Finished Level	195	195	178	178	1.93	23.8	1.56	2.59	3

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This report relates only to the positions tested.

IANZ Accredited Laboratory No:105

LPS-07F11 Issue date 04072016

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W02047

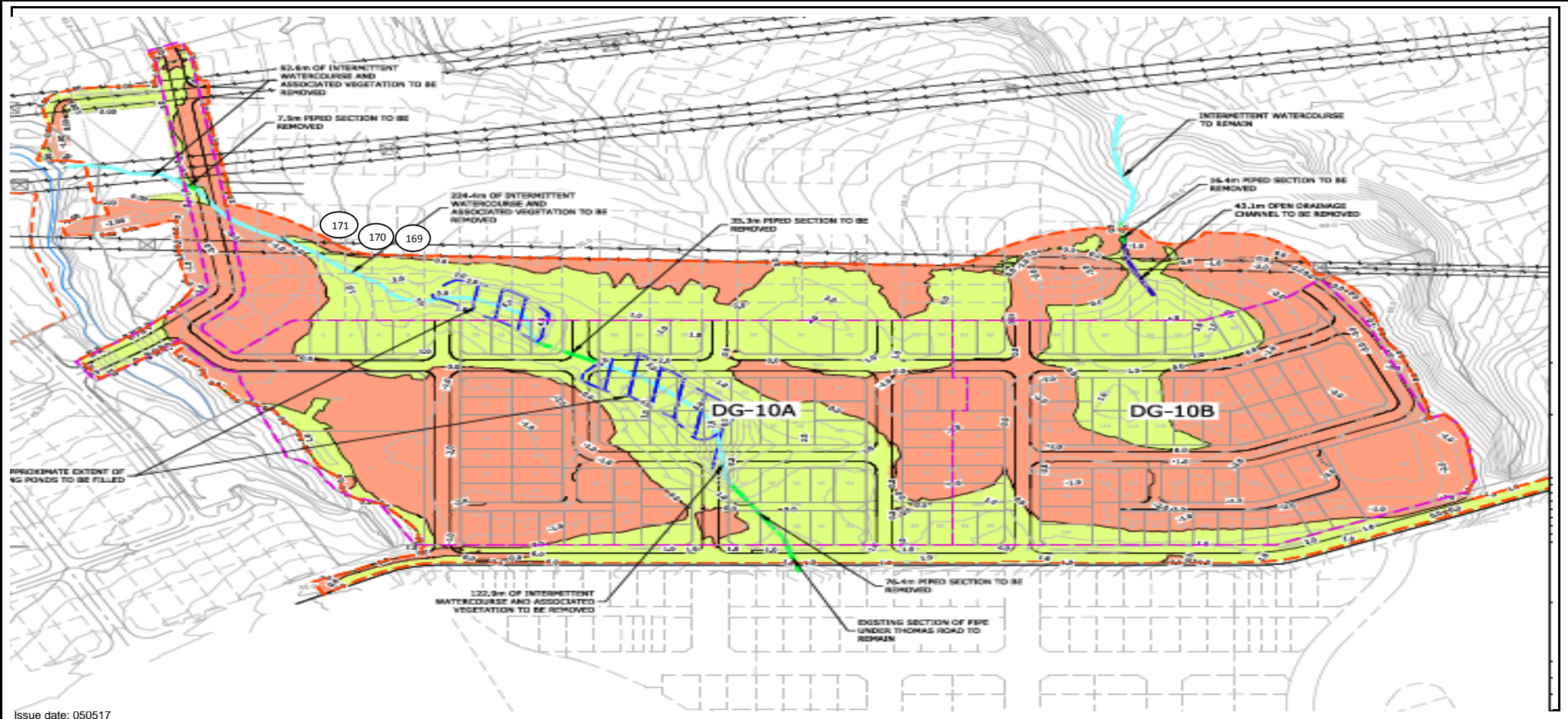
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS

**Date tested:** 4.05.18





Client:

Coffey Services NZ Ltd (Auckland)

Address

PO Box 8261, Symonds Street, Auckland 1150

Attention:

Ray Berry

c.c:

-

Project:

773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

Location:


Flat Bush

PROJECT CODE:

773-ETAM00525AA

Page:

1 of 2



Tests indicated as not accredited are outside the scope of the laboratory's accreditation

Approved Signatory:

Cesar Pura

Issue date:

21/05/2018

Test method:

Test Methods in accordance with: \*Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³)	Air Voids (%)
9/05/2018	ETAM18W02053	MA&FC	172	Fill	CLAY	Lot 82	1770361	5905085	-	150	Finished Level	214+	214+	214+	214+	1.88	28.6	1.46	2.59	2
9/05/2018	ETAM18W02053	MA&FC	173	Fill	CLAY	Lot 85	1770324	5905125	-	150	Finished Level	108	104	104	101	1.89	31.3	1.44	2.59	0

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 This report relates only to the positions tested.  
 IANZ Accredited Laboratory No:105  
 LPS-07F11 Issue date 04072016



## SITE PLAN

NOT TO SCALE

**Project No: 773-ETAM00525AA**

Work Order No: ETAM18W02053

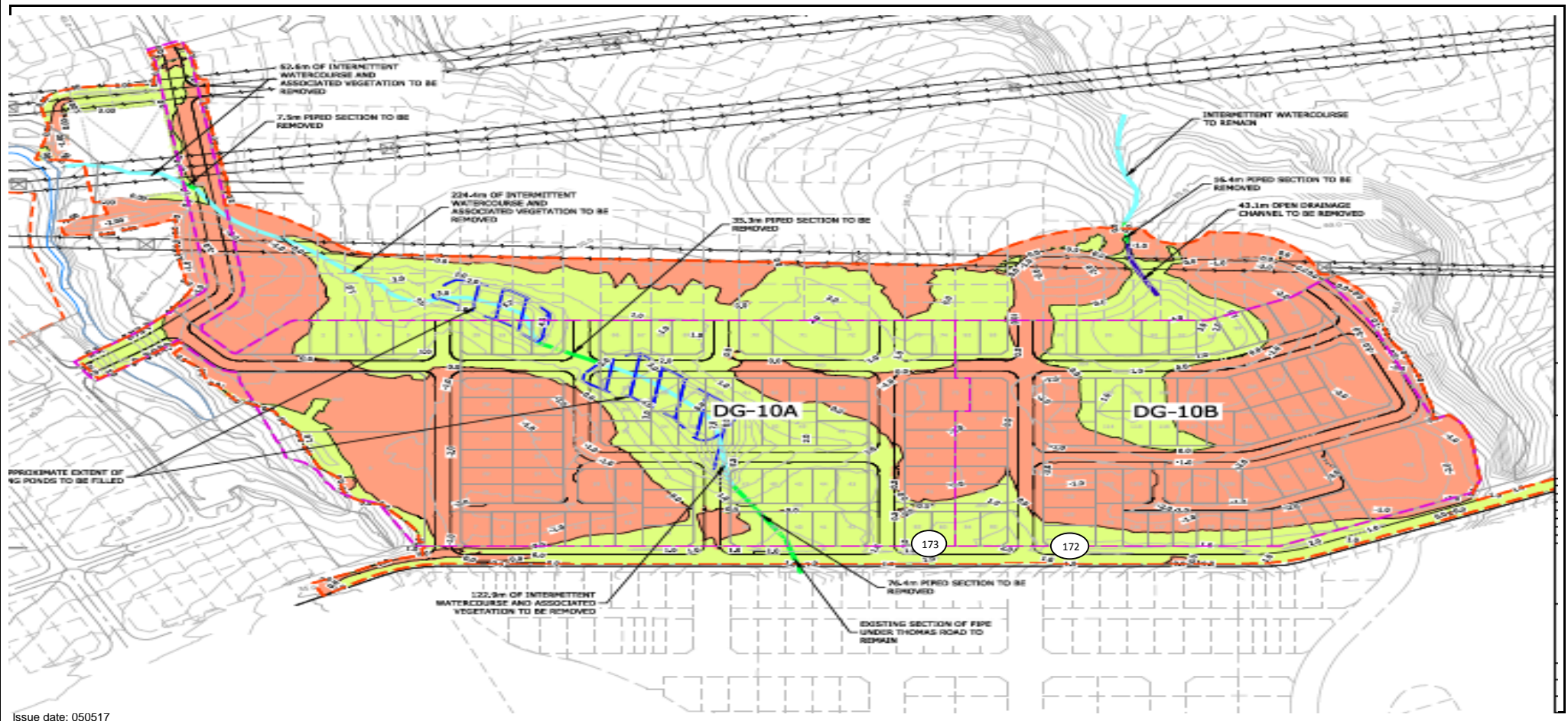
Page No: 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

Tested by: MA & FC

Date tested: 9.05.18



Issue date: 050517

Client:

Coffey Services NZ Ltd (Auckland)

Address

PO Box 8261, Symonds Street, Auckland 1150

Attention:

Ray Berry

c.c:

-

Project:

773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

Location:


Flat Bush

PROJECT CODE:

773-ETAM00525AA

Page:

1 of 2



Tests indicated as not accredited are outside the scope of the laboratory's accreditation

Approved Signatory:

Cesar Pura

Issue date:

22/05/2018

Test method:

Test Methods in accordance with: \*Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³)	Air Voids (%)
10/05/2018	ETAM18W02055	MA	174	Fill	CLAY	Gully Pond B	1770361	5905416	-	150	2m to Finished Level	164	135	143	160	1.88	39.9	1.34	2.59	0
10/05/2018	ETAM18W02055	MA	175	Fill	CLAY	Gully Pond B	1770367	5905410	-	150	2m to Finished Level	178	168	155	158	1.82	35.7	1.34	2.59	0

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W02055

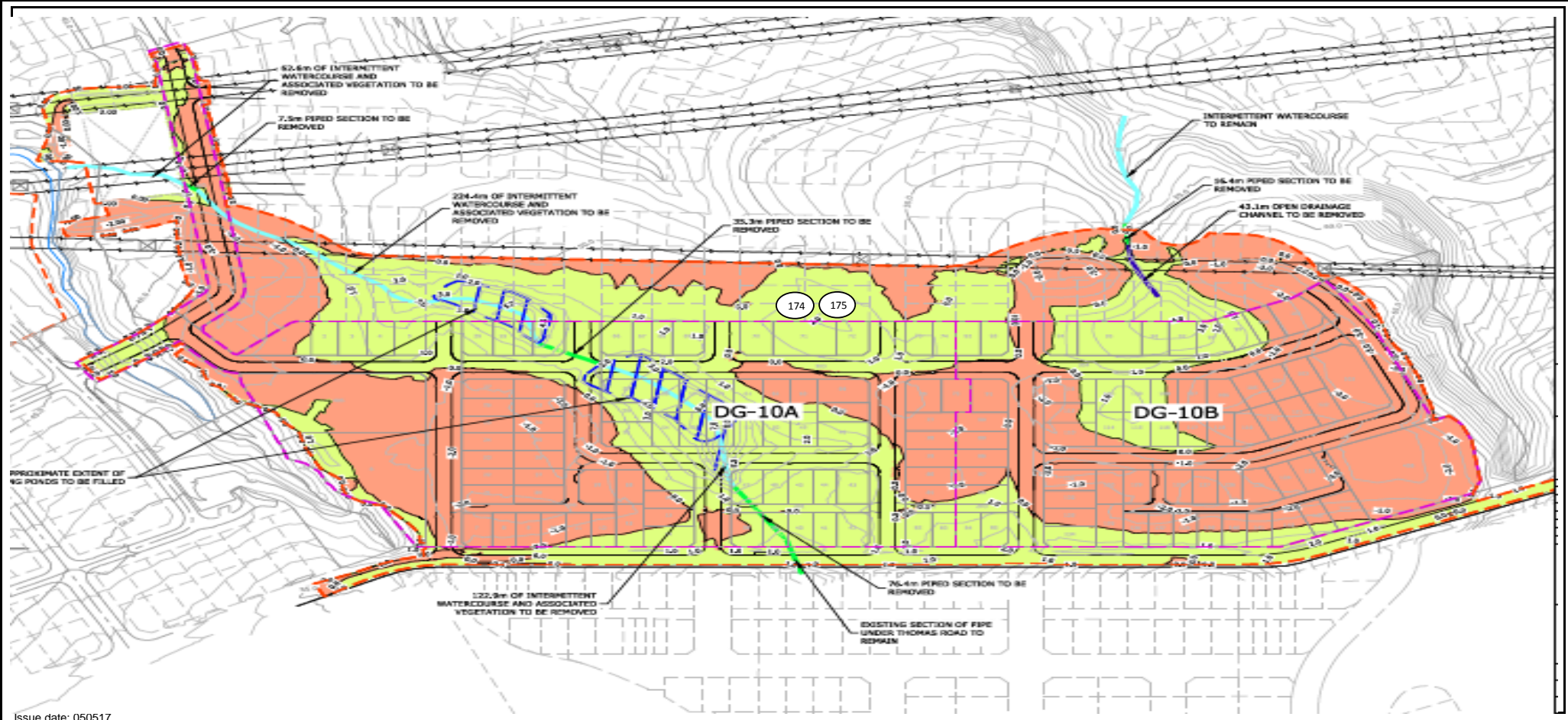
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush


**Location:** As below

**Tested by:** MA

**Date tested:** 10.05.18





<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Ray Berry <b>c.c:</b> - <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div>  <div>           Tests indicated as not accredited are outside the scope of the laboratory's accreditation           <div>             Approved Signatory: Cesar Pura              Issue date: 24/05/2018           </div> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³)	Air Voids (%)
11/05/2018	ETAM18W02116	AB	176	Fill	CLAY	General Fill	1770375	5905416	-	150	At Finihed Level	154	151	165	175	1.86	39.4	1.33	2.59	0
11/05/2018	ETAM18W02116	AB	177	Fill	Silty CLAY	General Fill	1770314	5905453	-	150	At Finihed Level	205	UTP	UTP	UTP	1.85	36.7	1.35	2.59	0



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W02116

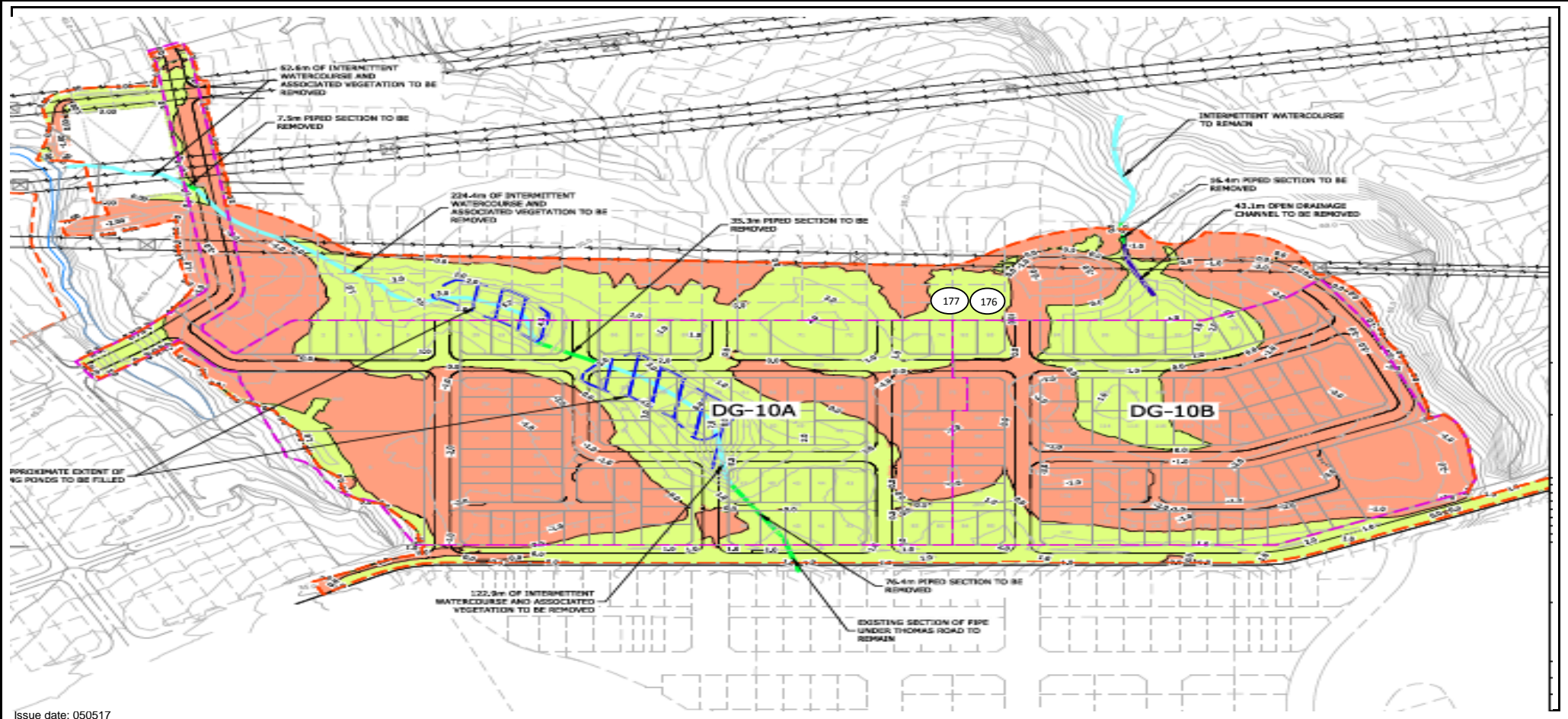
**Page No:** 2 of 2



**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** AB

**Date tested:** 11.05.18



<b>Client:</b>	Coffey Services NZ Ltd (Auckland)	<b>PROJECT CODE:</b>	773-ETAM00525AA																		
<b>Address</b>	PO Box 8261, Symonds Street, Auckland 1150	<b>Page:</b>	1 of 2																		
<b>Attention:</b>	Ray Berry		Tests indicated as not accredited are outside the scope of the laboratory's accreditation															Approved Signatory:		Cesar Pura	
<b>c.c:</b>	-																	Issue date:		5/06/2018	
<b>Project:</b>	773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush																				
<b>Location:</b>	Flat Bush																				
<b>Test method:</b>	Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)	
30/05/2018	ETAM18W02405	SC	178	Fill	Silty CLAY	General Fill	1770133	5905618	48.50	150	-	187	180	72	172	1.91	24.5	1.53	2.59	3	

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W02405

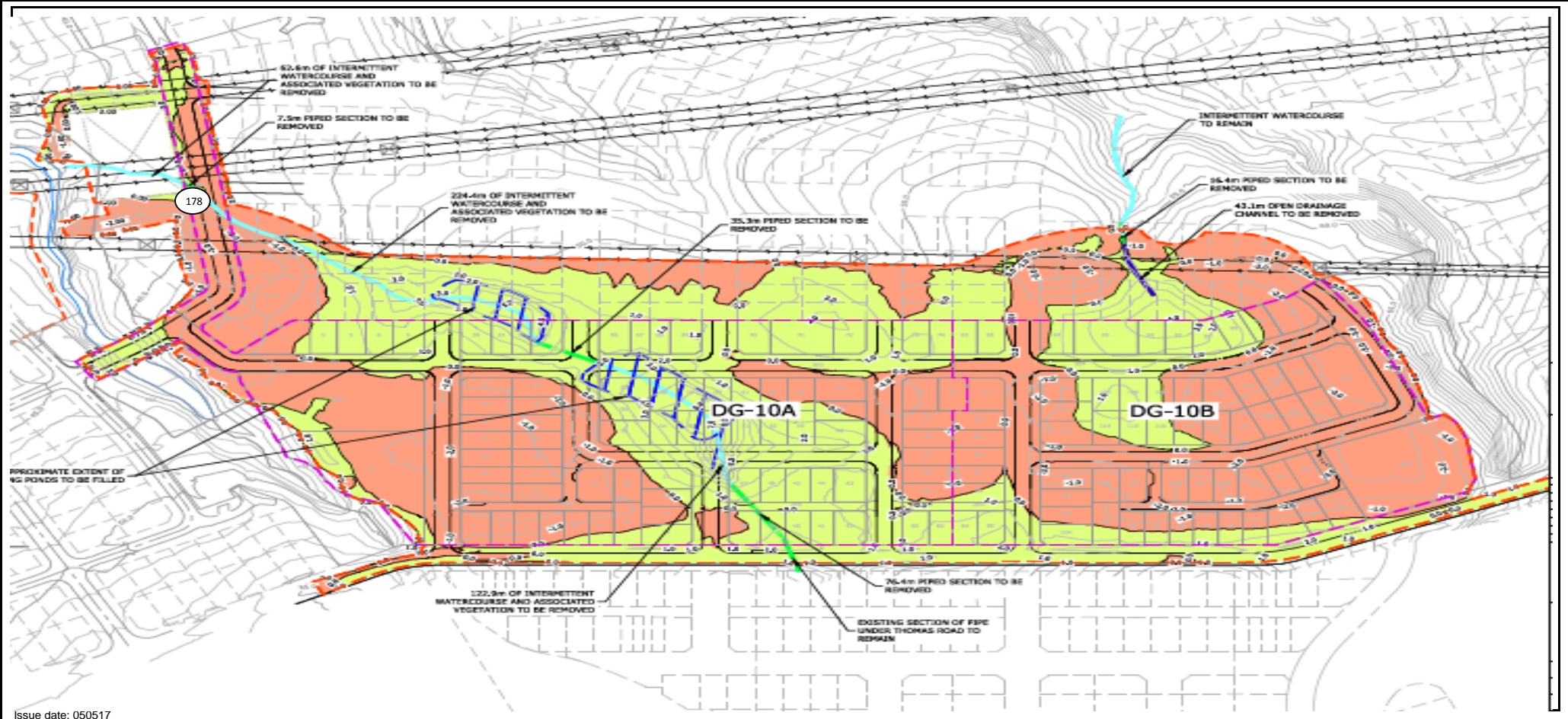
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** SC

**Date tested:** 30.05.18





<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA										
Address PO Box 8261, Symonds Street, Auckland 1150										Page: 1 of 2										
<b>Attention:</b> Ray Berry										<div><div><div>IANZ</div><div>ACCREDITED LABORATORY</div></div><div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div></div> <div><div>Approved Signatory:</div><div>Cesar Pura</div></div>										
<b>c.c:</b> -																				
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush										Issue date: 5/06/2018										
Location: Flat Bush																				
Test method: Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
1/06/2018	ETAM18W02424	JJ	179	Fill	Silty CLAY	General Fill	1770133	5905618	48.50	150	Retest of Test No.178	150	168	123	146	2.18	24.0	1.76	2.59	0
1/06/2018	ETAM18W02424	JJ	180	Fill	Silty CLAY	Old Pond	1770228	5905393	-	150	Retest of Test No.147	UTP	UTP	UTP	UTP	1.89	31.0	1.44	2.59	0
1/06/2018	ETAM18W02424	JJ	181	Fill	Silty CLAY	Pond B	1770381	5905265	-	150	Retest of Test No.149	UTP	UTP	UTP	UTP	1.86	30.8	1.42	2.59	2
1/06/2018	ETAM18W02424	JJ	182	Fill	Silty CLAY	Pond B	1770369	5905278	-	150	Retest of Test No.150	UTP	UTP	UTP	UTP	1.72	27.4	1.35	2.59	11
1/06/2018	ETAM18W02424	JJ	183	Fill	Silty CLAY	Eastern Transmission	1770709	5905231	-	150	Retest of Test No.151, 200mm to Finished Level	UTP	UTP	UTP	UTP	1.80	45.0	1.24	2.59	0
1/06/2018	ETAM18W02424	JJ	184	Fill	Silty CLAY	Lot Fill	1770486	5905199	-	150	Retest of Test No.153, 700mm to Finished Level	UTP	UTP	UTP	UTP	1.92	50.2	1.28	2.59	0
1/06/2018	ETAM18W02424	JJ	185	Fill	Silty CLAY	Western Transmission Gully	1770154	5905582	-	150	Retest of Test No.166	UTP	UTP	UTP	UTP	1.86	40.5	1.33	2.59	0
1/06/2018	ETAM18W02424	JJ	186	Fill	Silty CLAY	Lot 85	1770324	5905125	-	150	Retest of Test No.173	UTP	UTP	UTP	UTP	1.80	38.3	1.30	2.59	0



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W02424

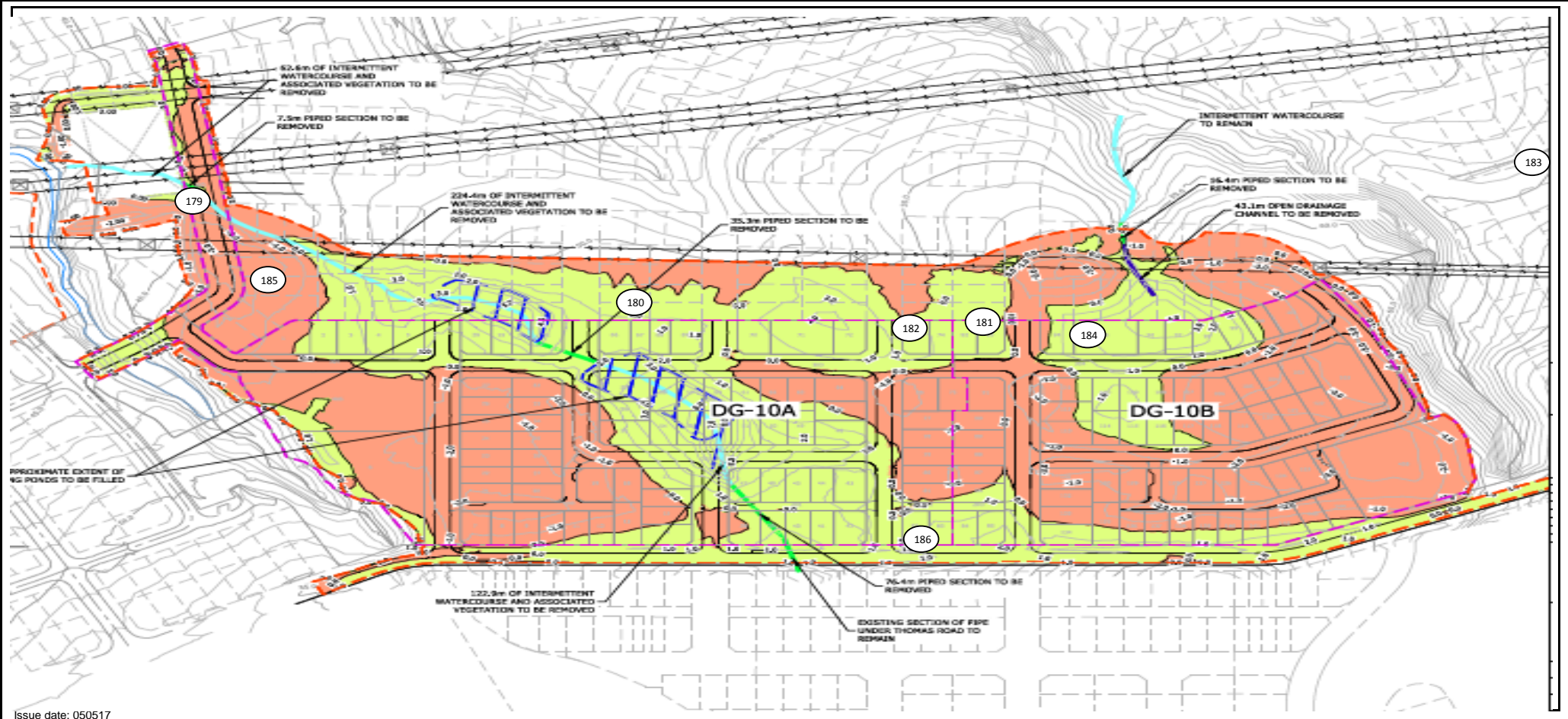
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ

**Date tested:** 1.06.18



<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA										
<b>Address</b> PO Box 8261, Symonds Street, Auckland 1150										<b>Page:</b> 1 of 2										
<b>Attention:</b> Ray Berry										<div><div>IANZ</div><div>ACCREDITED LABORATORY</div></div> <div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div> <div><div>Approved Signatory:</div><div>Issue date:</div></div> <div><div>Cesar Pura</div><div>16/07/2018</div></div>										
<b>c.c:</b> -																				
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush																				
<b>Location:</b> Flat Bush																				
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
13/07/2018	ETAM18W03163	MA	187	Fill	CLAY	Transmission Pad	1770146	5905620	-	150	At Finished Level	120	101	86	91	1.92	29.9	1.48	2.59	0
13/07/2018	ETAM18W03163	MA	188	Fill	CLAY	Transmission Pad	1770157	5905638	-	150	At Finished Level	77	86	91	84	1.72	49.2	1.15	2.59	0

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W03163

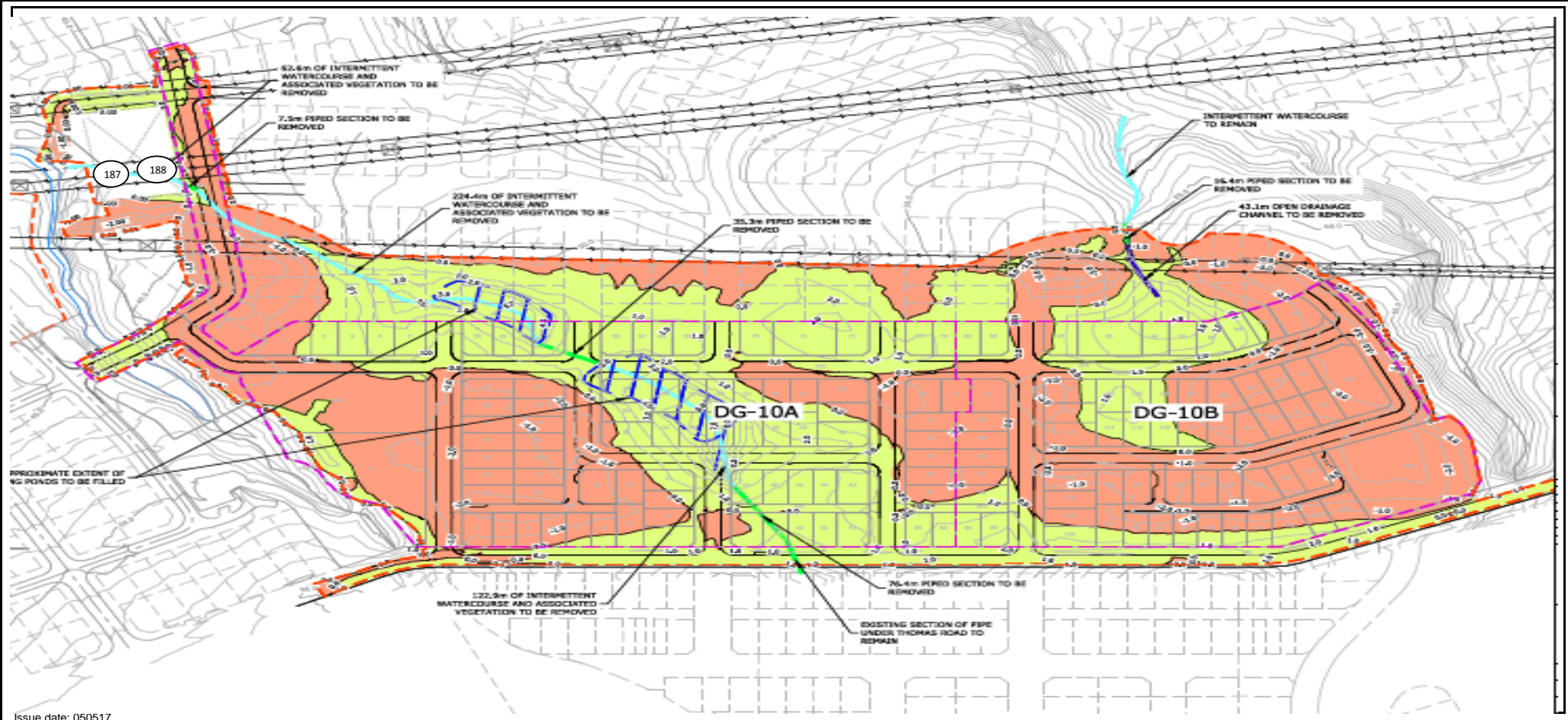
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush


**Location:** As below

**Tested by:** MA

**Date tested:** 13.07.18





<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA										
Address PO Box 8261, Symonds Street, Auckland 1150										Page: 1 of 2										
<b>Attention:</b> Jade Dunne										<div><div><div>IANZ</div><div>ACCREDITED LABORATORY</div></div><div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div><div><div>Approved Signatory:</div><div>Issue date:</div></div><div><div></div><div>Cesar Pura</div><div>22/11/2018</div></div></div>										
<b>c.c.:</b> Ray Berry																				
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush																				
Location: Flat Bush																				
Test method: Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
19/11/2018	ETAM18W05082	BS	190	Fill	Silty CLAY	Pond Fill	1770380	5905373	-	150	0.5m to Finished Level	198	170	170	163	1.70	32.4	1.29	2.59	9
19/11/2018	ETAM18W05082	BS	191	Fill	Silty CLAY	Pond Fill	1770356	5905391	-	150	0.5m to Finished Level	133	123	137	130	1.76	30.7	1.35	2.59	6
19/11/2018	ETAM18W05082	BS	192	Fill	Silty CLAY	General Fill	1770158	5905606	-	150	At Finished Level	UTP	UTP	237+	237+	1.92	25.0	1.54	2.59	2
19/11/2018	ETAM18W05082	BS	193	Fill	Silty CLAY	General Fill	1770164	5905617	-	150	At Finished Level	156	140	140	133	1.75	40.0	1.25	2.59	2



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W05082

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** Refer to plan

**Tested by:** BS

**Date tested:** 19/11/2018



<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA										
Address: PO Box 8261, Symonds Street, Auckland 1150										Page: 1 of 2										
<b>Attention:</b> Jade Dunne										<div><div>IANZ</div><div>ACCREDITED LABORATORY</div></div> <div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div> <div><div>Approved Signatory:</div><div>Cesar Pura</div></div> <div><div>Issue date:</div><div>17/12/2018</div></div>										
<b>c.c.:</b> Ray Berry																				
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush																				
Location: Flat Bush																				
Test method: Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
11/12/2018	ETAM18W05599	BS	194	Fill	Silty CLAY	Pond Fill	1770380	5905373	-	150	Retest of Test No. 191 (0.5m to Finished Level)	198	UTP	UTP	UTP	1.91	28.8	1.48	2.59	0

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W05599

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS

**Date tested:** 11/12/2018



Client:

Coffey Services NZ Ltd (Auckland)

Address

PO Box 8261, Symonds Street, Auckland 1150

Attention:

Jade Dunne

c.c:

Ray Berry

Project:

773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

Location:


Flat Bush

PROJECT CODE:

773-ETAM00525AA

Page:

1 of 2



Tests indicated as not accredited are outside the scope of the laboratory's accreditation

Approved Signatory:

Cesar Pura

Issue date:

19/12/2018

Test method:

Test Methods in accordance with: \*Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
14/12/2018	ETAM18W05653	BS	195	Fill	Silty CLAY	Transmission Pad	1770158	5905624	-	150	At Finished Level	140	156	170	170	1.80	24.9	1.44	2.59	8
14/12/2018	ETAM18W05653	BS	196	Fill	Silty CLAY	Transmission Pad	1770166	5905635	-	150	At Finished Level	UTP	UTP	UTP	UTP	1.91	19.7	1.59	2.59	7

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 IANZ Accredited Laboratory No:105  
 LPS-07F11 Issue date 04072016



## SITE PLAN

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**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W05653

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS

**Date tested:** 14/12/2018



<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA										
Address PO Box 8261, Symonds Street, Auckland 1150										Page: 1 of 2										
<b>Attention:</b> Jade Dunne										<div><div>IANZ</div><div>ACCREDITED LABORATORY</div></div> <div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div> <div><div>Approved Signatory:</div><div>Cesar Pura</div></div> <div><div>Issue date:</div><div>21/12/2018</div></div>										
<b>c.c:</b> Ray Berry																				
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush																				
Location: Flat Bush																				
Test method: Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
18/12/2018	ETAM18W05754	BS	197	Fill	Silty CLAY	Old Office	1770408	5905069	-	150	1.0m to Finished Level	170	170	225	225	1.78	32.3	1.35	2.59	4
18/12/2018	ETAM18W05754	BS	198	Fill	Silty CLAY	Old Office	1770431	5905053	-	150	1.0m to Finished Level	UTP	UTP	UTP	UTP	1.80	30.9	1.37	2.59	5

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W05754

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** BS

**Date tested:** 18/12/2018



Client:

Coffey Services NZ Ltd (Auckland)

Address

PO Box 8261, Symonds Street, Auckland 1150

Attention:

Jade Dunne

c.c:

Ray Berry

Project:

773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

Location:


Flat Bush

PROJECT CODE:

773-ETAM00525AA

Page:

1 of 2



Tests indicated as not accredited are outside the scope of the laboratory's accreditation

Approved Signatory:

Cesar Pura

Issue date:

21/12/2018

Test method:

Test Methods in accordance with: \*Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
19/12/2018	ETAM18W05784	TR	199	Fill	Silty CLAY	Pond B	1770351	5905347	-	150	0.5m to Finished Level	143	143	177	177	1.81	27.9	1.41	2.59	6

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 IANZ Accredited Laboratory No:105  
 LPS-07F11 Issue date 04072016



## SITE PLAN

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**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM18W05784

**Page No:** 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** TR

**Date tested:** 19/12/2018



<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA											
Address PO Box 8261, Symonds Street, Auckland 1150										Page: 1 of 2											
<b>Attention:</b> Jade Dunne										<div><div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div><div>Approved Signatory: Cesar Pura</div><div>Issue date: 15/01/2019</div></div>											
<b>c.c:</b> Ray Berry																					
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush																					
Location: Flat Bush																					
Test method: Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																					
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)	
9/01/2019	ETAM19W00089	TR	200	Fill	Silty CLAY	Pond C	1770172	5905470	-	150	0.7m from the bottom	UTP	UTP	UTP	UTP	1.91	27.5	1.50	2.59	1	
9/01/2019	ETAM19W00089	TR	201	Fill	Silty CLAY	Pond C	1770171	5905487	-	150	0.7m from the bottom	143	143	191	191	1.80	36.9	1.31	2.59	1	

## SITE PLAN

NOT TO SCALE

**Project No: 773-ETAM00525AA**

Work Order No: ETAM19W00089

Page No: 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below



Tested by:

TR

Date tested:

9/01/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush  <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2  <div>  <div>           Tests indicated as not accredited are outside the scope of the laboratory's accreditation         </div> <div>             Approved Signatory: Cesar Pura            Issue date: 15/01/2019         </div> </div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
10/01/2019	ETAM19W00101	TR	202	Fill	Silty CLAY	Pond C	1770185	5905467	-	150	1.3m from the bottom	110	110	95	126	1.77	44.7	1.22	2.59	0
10/01/2019	ETAM19W00101	TR	203	Fill	Silty CLAY	Pond C	1770175	5905481	-	150	1.3m from the bottom	110	110	143	162	1.90	35.2	1.40	2.59	0



## SITE PLAN

NOT TO SCALE

**Project No: 773-ETAM00525AA**

Work Order No: ETAM19W00101

Page No: 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

Tested by: TR

Date tested: 10/01/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA										
Address PO Box 8261, Symonds Street, Auckland 1150										Page: 1 of 2										
<b>Attention:</b> Jade Dunne										<div><div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div><div>Approved Signatory: Cesar Pura</div><div>Issue date: 22/01/2019</div></div>										
<b>c.c:</b> Ray Berry																				
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush																				
Location: Flat Bush																				
Test method: Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
17/01/2019	ETAM19W00218	AB	212	Fill	Silty CLAY	General Fill	1770188	5905458	-	150	~0.5m to Subgrade Level	183	188	149	156	1.79	41.7	1.26	2.59	0
17/01/2019	ETAM19W00218	AB	213	Fill	Silty CLAY	General Fill	1770171	5905485	-	150	~0.5m to Subgrade Level	156	156	163	170	1.83	33.4	1.37	2.59	1

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00218

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush


**Location:** As below

**Tested by:** AB

**Date tested:** 17/01/2019





<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush  <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div><div><div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div></div><div><div>Approved Signatory:</div><div>Cesar Pura</div></div><div><div>Issue date:</div><div>22/01/2019</div></div></div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
18/01/2019	ETAM19W00247	MP	214	Fill	Gravelly CLAY	Pond C	1770187	5905454	-	150	~1.5m to Subgrade Level	94	155	155	136	1.74	46.4	1.19	2.59	0
18/01/2019	ETAM19W00247	MP	215	Fill	Gravelly CLAY	Pond C	1770165	5905468	-	150	~1.5m to Subgrade Level	136	136	109	123	1.84	34.0	1.37	2.59	0
18/01/2019	ETAM19W00247	MP	216	Fill	Gravelly CLAY	Pond C	1770184	5905469	-	150	~1.5m to Subgrade Level	155	177	202	109	1.87	32.9	1.41	2.59	0
18/01/2019	ETAM19W00247	MP	217	Fill	Gravelly CLAY	Gully B	1770353	5905350	52.0	150		UTP	UTP	UTP	207+	1.86	23.0	1.51	2.59	7
18/01/2019	ETAM19W00247	MP	218	Fill	Gravelly CLAY	Gully B	1770369	5905339	52.0	150		UTP	UTP	207+	207+	1.86	36.5	1.36	2.59	0
18/01/2019	ETAM19W00247	MP	219	Fill	Gravelly CLAY	Gully B	1770374	5905354	51.8	150		202	136	177	177	1.85	30.4	1.42	2.59	2
18/01/2019	ETAM19W00247	MP	220	Fill	Gravelly CLAY	Gully B	1770360	5905359	51.8	150		177	207+	207	207	1.81	38.4	1.31	2.59	0



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00247

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:**

MP

**Date tested:**

18/01/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA										
Address PO Box 8261, Symonds Street, Auckland 1150										Page: 1 of 2										
<b>Attention:</b> Jade Dunne										<div><div><div>IANZ</div><div>ACCREDITED LABORATORY</div></div><div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div></div> <div><div>Approved Signatory:</div><div>Cesar Pura</div></div>										
<b>c.c:</b> Ray Berry																				
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush										<div><div>Issue date:</div><div>23/01/2019</div></div>										
Location: Flat Bush																				
Test method: Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
21/01/2019	ETAM19W00258	SC	221	Fill	Gravelly Silty CLAY	Pond C	1770187	5905454	-	150	Retest of Test No. 214	155	155	202	202	1.78	42.5	1.25	2.59	0
21/01/2019	ETAM19W00258	SC	222	Fill	Gravelly Silty CLAY	Pond C	1770165	5905468	-	150	Retest of Test No. 215	202	202	177	177	1.77	39.1	1.27	2.59	1
21/01/2019	ETAM19W00258	SC	223	Fill	Gravelly Silty CLAY	Pond C	1770184	5905469	-	150	Retest of Test No. 216	202	202	202	202	1.80	34.8	1.34	2.59	2
21/01/2019	ETAM19W00258	SC	224	Fill	Gravelly Silty CLAY	Pond C	1770141	5905468	-	150	~0.5m to Subgrade Level	202	202	202	202	1.81	35.6	1.33	2.59	1
21/01/2019	ETAM19W00258	SC	225	Fill	Silty CLAY	Gully General Fill	1770379	5905350	-	150	~0.9m to Finished Level	202	202	202	155	1.77	37.7	1.29	2.59	2
21/01/2019	ETAM19W00258	SC	226	Fill	Silty CLAY	Gully General Fill	1770371	5905336	-	150	~0.9m to Finished Level	202	202	155	155	1.78	28.4	1.39	2.59	7
21/01/2019	ETAM19W00258	SC	227	Fill	Silty CLAY	Gully General Fill	1770351	5905346	-	150	~0.9m to Finished Level	202	202	202	177	1.85	30.3	1.42	2.59	2
21/01/2019	ETAM19W00258	SC	228	Fill	Silty CLAY	Gully General Fill	1770357	5905363	-	150	~0.9m to Finished Level	177	177	202	202	1.89	26.2	1.50	2.59	3

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00258

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush


**Location:** As below

**Tested by:** SC

**Date tested:** 21/01/2019





<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush  <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div><div><div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div></div><div><div>Approved Signatory:</div><div>Cesar Pura</div></div><div><div>Issue date:</div><div>24/01/2019</div></div></div>										
Test method: Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
22/01/2019	ETAM19W00265	TR	229	Fill	Gravelly CLAY	Pond C	1770193	5905451	-	150	~0.2m to Subgrade Level	UTP	UTP	UTP	UTP	1.82	21.8	1.50	2.59	10
22/01/2019	ETAM19W00265	TR	230	Fill	Gravelly CLAY	Pond C	1770182	5905454	-	150	~0.2m to Subgrade Level	UTP	UTP	UTP	UTP	1.80	25.6	1.43	2.59	8
22/01/2019	ETAM19W00265	TR	231	Fill	Gravelly CLAY	Gully B	1770381	5905338	-	150	~1.5m to Finished Level	202	202	UTP	UTP	1.88	32.8	1.42	2.59	0
22/01/2019	ETAM19W00265	TR	232	Fill	Gravelly CLAY	Gully B	1770376	5905326	-	150	~1.5m to Finished Level	UTP	202	202	202	1.93	28.1	1.51	2.59	0
22/01/2019	ETAM19W00265	TR	233	Fill	Gravelly CLAY	Gully B	1770349	5905343	-	150	~1.5m to Finished Level	UTP	UTP	205	205	1.76	31.7	1.34	2.59	6
22/01/2019	ETAM19W00265	TR	234	Fill	Gravelly CLAY	Gully B	1770358	5905350	-	150	~1.5m to Finished Level	UTP	UTP	202	202	1.97	24.7	1.58	2.59	0



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00265

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:**

TR

**Date tested:**

22/01/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA										
Address PO Box 8261, Symonds Street, Auckland 1150										Page: 1 of 2										
<b>Attention:</b> Jade Dunne										<div><div><div>IANZ</div><div>ACCREDITED LABORATORY</div></div><div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div></div> <div><div>Approved Signatory:</div><div>Cesar Pura</div></div>										
<b>c.c:</b> Ray Berry																				
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush										<div><div>Issue date:</div><div>25/01/2019</div></div>										
Location: Flat Bush																				
Test method: Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
23/01/2019	ETAM19W00272	TR	235	Fill	Gravelly CLAY	Pond C	1770194	5905445	-	150	At Finished Level	155	159	202	202	1.85	30.7	1.42	2.59	2
23/01/2019	ETAM19W00272	TR	236	Fill	Gravelly CLAY	Gully B	1770376	5905342	-	150	~150mm to Finished Level	202	190	UTP	177	1.83	28.9	1.42	2.59	4
23/01/2019	ETAM19W00272	TR	237	Fill	Gravelly CLAY	Gully B	1770383	5905325	-	150	~200mm to Finished Level	202	207	207	UTP	1.88	31.7	1.43	2.59	0
23/01/2019	ETAM19W00272	TR	238	Fill	Gravelly CLAY	Gully B	1770354	5905361	-	150	~400mm to Finished Level	205	207	UTP	UTP	1.90	25.7	1.51	2.59	3
23/01/2019	ETAM19W00272	TR	239	Fill	Gravelly CLAY	Gully B	1770345	5905345	-	150	~1.4m to Finished Level	202	202	190	202	1.91	30.7	1.46	2.59	0

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00272

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:**


TR

**Date tested:**

23/01/2019





<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA										
Address PO Box 8261, Symonds Street, Auckland 1150										Page: 1 of 2										
<b>Attention:</b> Jade Dunne										<div><div><p>ACCREDITED LABORATORY</p></div><div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div></div>										
<b>c.c:</b> Ray Berry																				
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush										<div>Approved Signatory: Cesar Pura</div>										
Location: Flat Bush										<div>Issue date: 29/01/2019</div>										
Test method: Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
25/01/2019	ETAM19W00290	JJ	240	Fill	Silty CLAY	Pond C	1770186	5905485	-	150	~1.0m to Finished Level	UTP	UTP	UTP	UTP	1.91	30.4	1.47	2.59	0
25/01/2019	ETAM19W00290	JJ	241	Fill	Silty CLAY	Pond C	1770195	5905471	-	150	~1.5m to Finished Level	UTP	UTP	UTP	UTP	1.89	29.2	1.46	2.59	1
25/01/2019	ETAM19W00290	JJ	242	Fill	Silty CLAY	Gully B	1770373	5905338	-	150	~2.0m to Finished Level	182	184	135	123	1.83	34.8	1.36	2.59	0
25/01/2019	ETAM19W00290	JJ	243	Fill	Silty CLAY	Gully B	1770370	5905313	-	150	~2.0m to Finished Level	UTP	UTP	179	195	1.83	29.2	1.41	2.59	4
25/01/2019	ETAM19W00290	JJ	244	Fill	Silty CLAY	Gully B	1770341	5905340	-	150	~0.3m to Finished Level	UTP	UTP	UTP	UTP	1.85	30.9	1.42	2.59	2
25/01/2019	ETAM19W00290	JJ	245	Fill	Silty CLAY	Gully B	1770363	5905343	-	150	~1.5m to Finished Level	123	139	154	113	1.83	34.5	1.36	2.59	1



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00290

**Page No:** 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ

**Date tested:** 25/01/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA										
Address PO Box 8261, Symonds Street, Auckland 1150										Page: 1 of 2										
<b>Attention:</b> Jade Dunne										<div><div><div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div></div><div><div>Approved Signatory:</div><div>Cesar Pura</div></div><div><div>Issue date:</div><div>1/02/2019</div></div></div>										
<b>c.c:</b> Ray Berry																				
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush																				
Location: Flat Bush																				
Test method: Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
29/01/2019	ETAM19W00358	JJ	246	Fill	Silty CLAY	Pond C	1770191	5905550	-	150	At Finished Level	UTP	UTP	216	176	1.88	30.2	1.44	2.59	1
29/01/2019	ETAM19W00358	JJ	247	Fill	Silty CLAY	Pond C	1770196	5905472	-	150	At Finished Level	UTP	209	223	UTP	1.82	28.8	1.41	2.59	5
29/01/2019	ETAM19W00358	JJ	248	Fill	Silty CLAY	Gully B	1770380	5905334	-	150	~1.0m to Finished Level	UTP	UTP	UTP	223	1.94	22.9	1.58	2.59	3
29/01/2019	ETAM19W00358	JJ	249	Fill	Silty CLAY	Gully B	1770370	5905325	-	150	~1.0m to Finished Level	184	UTP	UTP	203	1.90	26.3	1.50	2.59	2
29/01/2019	ETAM19W00358	JJ	250	Fill	Silty CLAY	Gully B	1770360	5905341	-	150	Retest of Test No. 245	UTP	173	182	218	1.88	29.1	1.46	2.59	1
29/01/2019	ETAM19W00358	JJ	251	Fill	Silty CLAY	Gully B	1770373	5905338	-	150	Retest of Test No. 242	145	154	176	UTP	1.81	36.6	1.33	2.59	0

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00358

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ

**Date tested:** 29/01/2019





<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA										
Address PO Box 8261, Symonds Street, Auckland 1150										Page: 1 of 2										
<b>Attention:</b> Jade Dunne										<div><div><div>IANZ</div><div>ACCREDITED LABORATORY</div></div><div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div></div> <div>Approved Signatory: Cesar Pura</div>										
<b>c.c:</b> Ray Berry																				
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush										Issue date: 1/02/2019										
Location: Flat Bush																				
Test method: Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
30/01/2019	ETAM19W00364	JJ	252	Fill	Silty CLAY	General Fill	1770270	5905404	-	150	~2.0m to Finished Level	145	182	UTP	152	1.90	33.3	1.43	2.59	0
30/01/2019	ETAM19W00364	JJ	253	Fill	Silty CLAY	General Fill	1770243	5905419	-	150	~3.0m to Finished Level	173	176	UTP	147	1.85	23.2	1.50	2.59	7
30/01/2019	ETAM19W00364	JJ	254	Fill	Silty CLAY	Gully B	1770352	5905354	-	150	~1.0m to Finished Level	UTP	UTP	UTP	UTP	1.92	18.5	1.62	2.59	8
30/01/2019	ETAM19W00364	JJ	255	Fill	Silty CLAY	Gully B	1770365	5905347	-	150	~1.0m to Finished Level	UTP	UTP	UTP	UTP	1.90	22.1	1.56	2.59	6
30/01/2019	ETAM19W00364	JJ	256	Fill	Silty CLAY	Gully B	1770374	5905332	-	150	~2.0m to Finished Level	160	152	UTP	192	1.81	32.0	1.37	2.59	3
30/01/2019	ETAM19W00364	JJ	257	Fill	Silty CLAY	Gully B	1770343	5905342	-	150	~1.0m to Finished Level	UTP	UTP	190	179	1.88	29.1	1.45	2.59	2



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00364

**Page No:** 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ

**Date tested:** 30/01/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA											
Address PO Box 8261, Symonds Street, Auckland 1150										Page: 1 of 2											
<b>Attention:</b> Jade Dunne										<div><div><div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div></div><div><div>Approved Signatory:</div><div>Cesar Pura</div></div><div><div>Issue date:</div><div>4/02/2019</div></div></div>											
<b>c.c.:</b> Ray Berry																					
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush																					
Location: Flat Bush																					
Test method: Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																					
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)	
31/01/2019	ETAM19W00376	TR,MP	258	Fill	Silty CLAY	Refer to plan	1770280	5905393	-	150	~2.0m to Finished Level	UTP	UTP	UTP	UTP	1.94	23.7	1.57	2.59	2	
31/01/2019	ETAM19W00376	TR,MP	259	Fill	Gravelly CLAY	Refer to plan	1770287	5905404	-	150	~2.5m to Finished Level	UTP	UTP	UTP	UTP	2.18	8.4	2.01	2.59	5	
31/01/2019	ETAM19W00376	TR,MP	260	Fill	Silty CLAY	Refer to plan	1770237	5905418	-	150	~3.0m to Finished Level	141	179	175	224	1.89	21.4	1.56	2.59	7	
31/01/2019	ETAM19W00376	TR,MP	261	Fill	Silty CLAY	Refer to plan	1770239	5905427	-	150	~3.5m to Finished Level	UTP	UTP	UTP	175	1.92	25.8	1.53	2.59	2	

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00376

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** TR,MP

**Date tested:** 31/01/2019





Client:

Coffey Services NZ Ltd (Auckland)

Address

PO Box 8261, Symonds Street, Auckland 1150

Attention:

Jade Dunne

c.c:

Ray Berry

Project:

773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

Location:


Flat Bush

PROJECT CODE:

773-ETAM00525AA


Page:

1 of 2



Tests indicated as  
 not accredited are outside  
 the scope of the  
 laboratory's accreditation

Approved Signatory:

  
 James McKelvey

Issue date:

12/02/2019

Test method:

Test Methods in accordance with: \*Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
1/02/2019	ETAM19W00416	JJ	262	Fill	Silty CLAY	General Fill	1770242	5905417	-	150	At Finished Level	UTP	UTP	UTP	UTP	1.90	27.4	1.49	2.59	1
1/02/2019	ETAM19W00416	JJ	263	Fill	Silty CLAY	General Fill	1770287	5905406	-	150	~0.5m to Finished Level	UTP	UTP	UTP	UTP	1.90	19.4	1.59	2.59	7
1/02/2019	ETAM19W00416	JJ	264	Fill	Silty CLAY	Gully B	1770348	5905376	-	150	~1.0m to Finished Level	UTP	UTP	UTP	UTP	1.89	25.5	1.50	2.59	4
1/02/2019	ETAM19W00416	JJ	265	Fill	Silty CLAY	Gully B	1770334	5905351	-	150	~0.2m to Finished Level	UTP	UTP	UTP	UTP	1.93	23.2	1.57	2.59	3



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00416

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ

**Date tested:** 1/02/2019



Client:

Earthtec Projects Limited

Address

PO Box 284, Kumeu, Auckland 0841

Attention:

Jade Dunne

c.c:

Kirk Rolls

Project:

773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

Location:


Flat Bush

PROJECT CODE:

773-ETAM00525AA


Page:

1 of 2



Tests indicated as  
 not accredited are outside  
 the scope of the  
 laboratory's accreditation

Approved Signatory:

  
 James McKelvey

Issue date:

13/02/2019

Test method:

Test Methods in accordance with: \*Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
4/02/2019	ETAM19W00435	SC	266	Fill	Silty CLAY	Gully Fill	1770375	5905314	-	150	~1.5m to Finished Level	UTP	UTP	UTP	UTP	1.92	24.0	1.54	2.59	3.3
4/02/2019	ETAM19W00435	SC	267	Fill	Silty CLAY	Gully Fill	1770357	5905334	-	150	~0.5m to Finished Level	UTP	UTP	UTP	UTP	1.96	22.5	1.60	2.59	2.2

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00435

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** SC

**Date tested:** 4/02/2019



Client:

Earthtec Projects Limited

Address

PO Box 284, Kumeu, Auckland 0841

Attention:

Jade Dunne

c.c:

Kirk Rolls

Project:

773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

Location:


Flat Bush

PROJECT CODE:

773-ETAM00525AA


Page:

1 of 2



Tests indicated as  
 not accredited are outside  
 the scope of the  
 laboratory's accreditation

Approved Signatory:

  
 James McKelvey

Issue date:

13/02/2019

Test method:

Test Methods in accordance with: \*Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
5/02/2019	ETAM19W00453	SC	268	Fill	Silty CLAY	Pond A	1770513	5905238	-	150	~1.2m to Finished Level	187	187	207	207	1.72	41.4	1.22	2.59	2.7
5/02/2019	ETAM19W00453	SC	269	Fill	Silty CLAY	Pond A	1770514	5905228	-	150	~3.1m to Finished Level	187	187	207	207	1.80	32.7	1.35	2.59	3.5



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00453

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** SC

**Date tested:** 5/02/2019



Client:

Earthtec Projects Limited

Address

PO Box 284, Kumeu, Auckland 0841

Attention:

Jade Dunne

c.c:

Kirk Rolls

Project:

773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

Location:


Flat Bush

PROJECT CODE:

773-ETAM00525AA


Page:

1 of 2



Tests indicated as  
 not accredited are outside  
 the scope of the  
 laboratory's accreditation

Approved Signatory:

  
 James McKelvey

Issue date:

14/02/2019

Test method:

Test Methods in accordance with: \*Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
7/02/2019	ETAM19W00462	JJ	270	Fill		Gully B	1770390	5905311	-	150	At Finished Level	UTP	UTP	UTP	UTP	1.87	27.7	1.46	2.59	2.9
7/02/2019	ETAM19W00462	JJ	271	Fill		Pond A	1770512	5905222	-	150	~3.5m to Finished Level	152	176	182	UTP	1.71	43.4	1.19	2.59	2.1
7/02/2019	ETAM19W00462	JJ	272	Fill		Pond A	1770522	5905237	-	150	~2.5m to Finished Level	147	145	164	164	1.77	41.1	1.26	2.59	0

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00462

**Page No:** 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ

**Date tested:** 7/02/2019



<b>Client:</b> Earthtec Projects Limited	<b>PROJECT CODE:</b> 773-ETAM00525AA																			
<b>Address:</b> PO Box 284, Kumeu, Auckland 0841	<b>Page:</b> 1 of 2																			
<b>Attention:</b> Jade Dunne	 <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> <div><div>Approved Signatory:</div><div>James McKelvey</div></div>																			
<b>c.c.:</b> Kirk Rolls																				
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush																				
<b>Location:</b> Flat Bush	Issue 2: This report replaces the one from 15/02/2019	Issue date:	19/02/2019																	
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
8/02/2019	ETAM19W00464	JJ	273	Fill	Silty CLAY	Gully B Pond	1770366	5905393	-	150	~3.0m to Finished Level	UTP	UTP	UTP	UTP	1.85	17.6	1.57	2.59	11.6



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00464

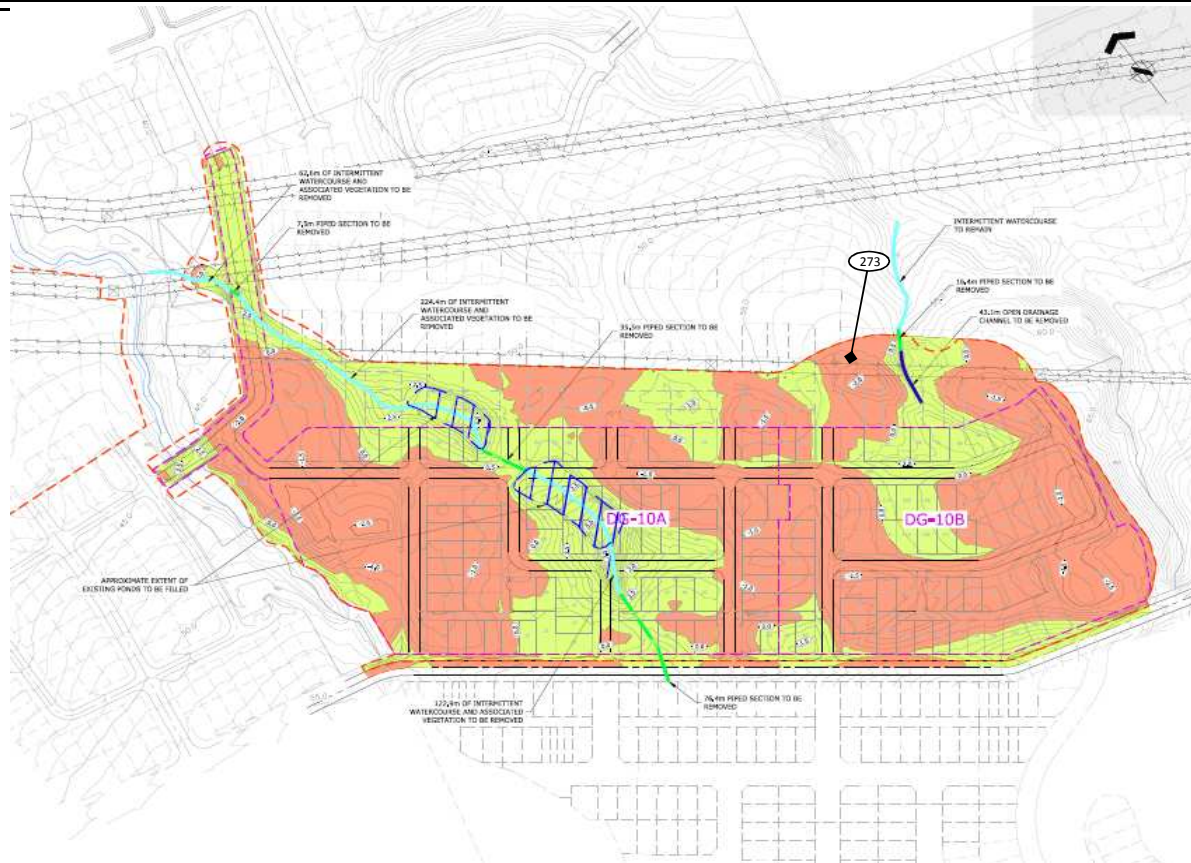
**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ

**Date tested:** 8/02/2019



Client:

Earthtec Projects Limited

Address

PO Box 284, Kumeu, Auckland 0841

Attention:

Jade Dunne

c.c:

Kirk Rolls

Project:

773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

Location:


Flat Bush

PROJECT CODE:

773-ETAM00525AA

Page:

1 of 2



Tests indicated as not accredited are outside the scope of the laboratory's accreditation

Approved Signatory:

Issue date:

James McKelvey

18/02/2019

Test method:

Test Methods in accordance with: \*Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa  UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
11/02/2019	ETAM19W00516	SC	274	Fill	Silty CLAY	Gully (Pond B)	1770364	5905397	-	150	~1.5m to Finished Level	UTP	UTP	207	207	1.90	27.8	1.49	2.59	1.3

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 This report relates only to the positions tested.  
 IANZ Accredited Laboratory No:105  
 LPS-07F11 Issue date 04072016

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00516

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** SC

**Date tested:** 11/02/2019



Client:

Earthtec Projects Limited

Address

PO Box 284, Kumeu, Auckland 0841

Attention:

Jade Dunne

c.c:

Kirk Rolls

Project:

773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

Location:


Flat Bush

PROJECT CODE:

773-ETAM00525AA


Page:

1 of 2



Tests indicated as  
 not accredited are outside  
 the scope of the  
 laboratory's accreditation

Approved Signatory:

  
 James McKelvey

Issue date:

19/02/2019

Test method:

Test Methods in accordance with: \*Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
12/02/2019	ETAM19W00533	SC	275	Fill	Silty CLAY	Gully B (Pond)	1770364	5905396	-	150	~0.5m to Finished Level	UTP	UTP	207	207	1.90	29.4	1.47	2.59	0.0
12/02/2019	ETAM19W00533	SC	276	Fill	Silty CLAY	Gully B	17703291	5905378	-	150	~0.5m to Finished Level	219	219	207	207	1.80	36.2	1.32	2.59	1.1
12/02/2019	ETAM19W00533	SC	277	Fill	Silty CLAY	Gully B	1770323	5905375	-	150	~0.5m to Finished Level	219	219	207	207	1.84	32.1	1.39	2.59	1.7



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00533

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** SC

**Date tested:** 12/02/2019



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This report relates only to the positions tested.  
IANZ Accredited Laboratory No:105  
LPS-07F11 Issue date 04072016

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00548

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** AB

**Date tested:** 13/02/2019



Client:

Coffey Services NZ Ltd (Auckland)

Address

PO Box 8261, Symonds Street, Auckland 1150

Attention:

Jade Dunne

c.c:

Ray Berry

Project:

773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

Location:


Flat Bush

PROJECT CODE:

773-ETAM00525AA


Page:

1 of 2



Tests indicated as  
 not accredited are outside  
 the scope of the  
 laboratory's accreditation

Approved Signatory:

  
 James McKelvey

Issue date:

20/02/2019

Test method:

Test Methods in accordance with: \*Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
14/02/2019	ETAM19W00602	JJ	280	Fill	Silty CLAY	Gully B Pond	1770315	5905423	-	150	At Finished Level	184	UTP	UTP	164	1.92	29.3	1.48	2.59	0
14/02/2019	ETAM19W00602	JJ	281	Fill	Silty CLAY	Gully B	1770302	5905361	-	150	At Finished Level	UTP	UTP	UTP	201	1.81	34.8	1.34	2.59	1.3



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00602

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ

**Date tested:** 14/02/2019



Client:

Coffey Services NZ Ltd (Auckland)

Address

PO Box 8261, Symonds Street, Auckland 1150

Attention:

Jade Dunne

c.c:

Ray Berry

Project:

773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

Location:


Flat Bush

PROJECT CODE:

773-ETAM00525AA

Page:

1 of 2



Tests indicated as not accredited are outside the scope of the laboratory's accreditation

Approved Signatory:

Cesar Pura

Issue date:

1/03/2019

Test method:

Test Methods in accordance with: \*Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
27/02/2019	ETAM19W00810	JJ	282	Fill	Silty CLAY	Pond A	1770545	5905212	-	150	~1.5m to Finished Level	152	173	UTP	UTP	1.83	35.5	1.35	2.59	0
27/02/2019	ETAM19W00810	JJ	283	Fill	Silty CLAY	Pond A	1770532	5905220	-	150	~1.5m to Finished Level	UTP	UTP	UTP	UTP	1.86	24.4	1.50	2.59	6

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 IANZ Accredited Laboratory No:105  
 LPS-07F11 Issue date 04072016

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00810

**Page No:** 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ

**Date tested:** 27/02/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA										
Address: PO Box 8261, Symonds Street, Auckland 1150										Page: 1 of 2										
<b>Attention:</b> Jade Dunne										<div><div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div><div>Approved Signatory: Cesar Pura</div><div>Issue date: 4/03/2019</div></div>										
<b>c.c.:</b> Ray Berry																				
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush																				
Location: Flat Bush																				
Test method: Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
28/02/2019	ETAM19W00832	JJ	284	Fill	Silty CLAY	Pond A	1770509	5905211	-	150	~3.5m to Finished Level	UTP	UTP	UTP	UTP	1.80	38.7	1.30	2.59	0
28/02/2019	ETAM19W00832	JJ	285	Fill	Silty CLAY	Pond A	1770506	5905227	-	150	~3.5m to Finished Level	UTP	UTP	UTP	UTP	1.78	43.8	1.24	2.59	0



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00832

**Page No:** 2 of 2



**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ

**Date tested:** 28/02/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c.:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush  <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2  <div>  <div>           Tests indicated as not accredited are outside the scope of the laboratory's accreditation         </div> </div> <div> <div>  </div> <div>           Approved Signatory: Cesar Pura            Issue date: 5/03/2019         </div> </div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
4/03/2019	ETAM19W00836	MP	287	Fill	Silty CLAY	Pond A	1770492	5905222	-	150	~1.2m to Finished Level	182	176	176	179	1.79	42.2	1.26	2.59	0

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00864

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:**

MP

**Date tested:**

4/03/2019



Client:

Coffey Services NZ Ltd (Auckland)

Address

PO Box 8261, Symonds Street, Auckland 1150

Attention:

Jade Dunne

c.c:

Ray Berry

Project:

773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

Location:


Flat Bush

PROJECT CODE:

773-ETAM00525AA

Page:

1 of 2



Tests indicated as  
 not accredited are outside  
 the scope of the  
 laboratory's accreditation

Approved Signatory:

Cesar Pura

Issue date:

7/03/2019

Test method:

Test Methods in accordance with: \*Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
5/03/2019	ETAM19W00891	JJ	288	Fill	Silty CLAY	Pond A	1770493	5905219	-	150	~2.5m to Finished Level	UTP	UTP	UTP	UTP	1.78	38.5	1.29	2.59	1



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00891

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ

**Date tested:** 5/03/2019



Client:

Coffey Services NZ Ltd (Auckland)

Address

PO Box 8261, Symonds Street, Auckland 1150

Attention:

Jade Dunne

c.c:

Ray Berry

Project:

773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

Location:


Flat Bush

PROJECT CODE:

773-ETAM00525AA

Page:

1 of 2



Tests indicated as not accredited are outside the scope of the laboratory's accreditation

Approved Signatory:

Cesar Pura

Issue date:

8/03/2019

Test method:

Test Methods in accordance with: \*Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.

Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
6/03/2019	ETAM19W00909	JJ	289	Fill	Silty CLAY	Pond A	1770466	5905221	-	150	~2.0m to Finished Level	211	227+	UTP	UTP	1.83	37.2	1.33	2.59	0

This report must not be altered or reproduced except in full.  
 This report relates only to the positions tested.  
 IANZ Accredited Laboratory No:105  
 LPS-07F11 Issue date 04072016

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00909

**Page No:** 2 of 2



**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ

**Date tested:** 6/03/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush  <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2  <div>  <div>           Tests indicated as not accredited are outside the scope of the laboratory's accreditation         </div> </div> <div> <div>  </div> <div>           Approved Signatory: Cesar Pura            Issue date: 14/03/2019         </div> </div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
12/03/2019	ETAM19W00989	TR	291	Fill	Silty CLAY	Pad on Pond A	1770488	5905211	-	150	~1.5m to Finished Level	UTP	UTP	UTP	UTP	1.78	25.0	1.42	2.59	9



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W00989

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below


**Tested by:**

TR

**Date tested:**

12/03/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland)										<b>PROJECT CODE:</b> 773-ETAM00525AA										
Address: PO Box 8261, Symonds Street, Auckland 1150										Page: 1 of 2										
<b>Attention:</b> Jade Dunne										<div><div>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</div><div>Approved Signatory: Cesar Pura</div><div>Issue date: 15/03/2019</div></div>										
<b>c.c.:</b> Ray Berry																				
<b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush																				
Location: Flat Bush																				
Test method: Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa				Wet Density (T/m³)	Oven Water Content (%)	Dry Density (T/m³)	Solid Density (T/m³) (Measured)	Air Voids (%)
13/03/2019	ETAM19W01009	JJ	292	Fill	Silty CLAY	Pond A Batter	1770475	5905233	-	150	~At Finished Level	143	152	UTP	164	1.80	39.1	1.30	2.59	0

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W01009

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ

**Date tested:** 13/03/2019







## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W01018

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below



**Tested by:**

TR

**Date tested:**

14/03/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c.:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> </div> <div style="margin-left: 20px; text-align: right;">   <b>Approved Signatory:</b> Ramir Casidsid  <b>Issue date:</b> 3/25/2019         </div> </div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa  UTP = Unable to penetrate				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
3/19/2019	ETAM19W01134	SC	294	Fill	Silty CLAY	SEA Area	1770583	5905238	-	150	~1.0m to Finished Level	207	207	207	207	1.81	34.6	1.34	2.59	2

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W01134

**Page No:** 2 of 2



**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** SC

**Date tested:** 19/03/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c.:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> </div> <div style="margin-left: 20px; text-align: right;">         Approved Signatory: Ramir Casidsid        Issue date: 3/25/2019     </div> </div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa  UTP = Unable to penetrate				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
3/20/2019	ETAM19W01150	MP	295	Fill	Silty CLAY	SEA Area	1770568	5905236	-	150	~0.5m to Finished Level	183	183	183	175	1.77	46.5	1.20	2.59	0



## SITE PLAN

NOT TO SCALE

**Project No: 773-ETAM00525AA**

Work Order No: ETAM19W01150

Page No: 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below



Tested by:

MP

Date tested:

20/03/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c.:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;">  <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> <p style="text-align: right;">             Approved Signatory: Cesar Pura            Issue date: 26/03/2019         </p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa  UTP = Unable to penetrate				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
21/03/2019	ETAM19W01187	JJ	296	Fill	Silty CLAY	SEA Area	1770578	5905218	-	150	~0.5m to Finished Level	UTP	UTP	UTP	UTP	1.80	32.7	1.35	2.59	3

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W01187

**Page No:** 2 of 2



**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ

**Date tested:** 21/03/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c.:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2  Tests indicated as not accredited are outside the scope of the laboratory's accreditation <div style="text-align: right;">   <b>Approved Signatory:</b> Cesar Pura  <b>Issue date:</b> 26/03/2019       </div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
22/03/2019	ETAM19W01188	TR	297	Fill	Silty CLAY	SEA Area	1770565	5905249	-	150	~0.3m to Finished Level	UTP	UTP	UTP	UTP	1.87	25.3	1.49	2.59	5



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W01188

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below


**Tested by:**

TR

**Date tested:**

22/03/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c.:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2  Tests indicated as not accredited are outside the scope of the laboratory's accreditation Approved Signatory: Cesar Pura Issue date: 28/03/2019										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
26/03/2019	ETAM19W01223	JJ	298	Fill	Silty CLAY	Future Lots	1770550	5905241	-	150	~1.0m to Finished Level	UTP	UTP	UTP	UTP	1.88	22.5	1.53	2.59	6

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W01223

**Page No:** 2 of 2



**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ

**Date tested:** 26/03/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c.:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2  Tests indicated as not accredited are outside the scope of the laboratory's accreditation <div style="text-align: right;">   <b>Approved Signatory:</b> Cesar Pura  <b>Issue date:</b> 10/04/2019       </div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
3/04/2019	ETAM19W01314	JJ	299	Fill	Silty CLAY	Future Lots	1770593	5905213	-	150	At Finished Level	UTP	UTP	UTP	UTP	1.97	38.3	1.42	2.59	0
3/04/2019	ETAM19W01314	JJ	300	Fill	Silty CLAY	Future Lots	1770525	5905264	-	150	~2.5m to Finished Level	UTP	UTP	UTP	UTP	1.86	33.6	1.39	2.59	0



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W01314

**Page No:** 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ

**Date tested:** 3/04/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c.:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2  Tests indicated as not accredited are outside the scope of the laboratory's accreditation <div style="text-align: right;"> <b>Approved Signatory:</b> Cesar Pura  <b>Issue date:</b> 10/04/2019         </div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
4/04/2019	ETAM19W01346	JJ	301	Fill	Silty CLAY	Future Lots	1770588	5905216	-	150	At Finished Level	UTP	UTP	UTP	UTP	1.99	30.9	1.52	2.59	0
4/04/2019	ETAM19W01346	JJ	302	Fill	Silty CLAY	Future Lots	1770527	5905264	-	150	~1.5m to Finished Level	UTP	UTP	UTP	UTP	1.96	33.5	1.46	2.59	0

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W01346

**Page No:** 2 of 2


**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ

**Date tested:** 4/04/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c.:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2  Tests indicated as not accredited are outside the scope of the laboratory's accreditation Approved Signatory: Cesar Pura Issue date: 10/04/2019										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
5/04/2019	ETAM19W01358	JJ	303	Fill	Silty CLAY	Future Lots	1770522	5905273	-	150	~0.5m to Finished Level	UTP	UTP	UTP	UTP	1.79	64.8	1.09	2.59	0



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W01358

**Page No:** 2 of 2



**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ

**Date tested:** 5/04/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c.:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2  Tests indicated as not accredited are outside the scope of the laboratory's accreditation <div style="text-align: right;">   <b>Approved Signatory:</b> Cesar Pura  <b>Issue date:</b> 11/04/2019       </div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
8/04/2019	ETAM19W01384	CP	304	Fill	Silty CLAY	Pond A	1770526	5905260	-	150	~1.0m to Finished Level	227+	227+	227+	227+	1.84	35.0	1.36	2.59	0

## SITE PLAN

NOT TO SCALE

**Project No: 773-ETAM00525AA**

Work Order No: ETAM19W01384

Page No: 2 of 2



**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

Tested by: CP

Date tested: 8/04/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c.:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2  Tests indicated as not accredited are outside the scope of the laboratory's accreditation <div style="text-align: right;">   <b>Approved Signatory:</b> Cesar Pura  <b>Issue date:</b> 12/04/2019       </div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
9/04/2019	ETAM19W01393	TR	305	Fill	Silty CLAY	Pond A	1770521	5905276	-	150	~1.2m to Finished Level	179	210	163	193	1.79	35.9	1.32	2.59	2



## SITE PLAN

NOT TO SCALE

**Project No: 773-ETAM00525AA**

Work Order No: ETAM19W01393

Page No: 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below



Tested by:

TR

Date tested:

9/04/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c.:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2  Tests indicated as not accredited are outside the scope of the laboratory's accreditation <div style="text-align: right;">   <b>Approved Signatory:</b> Cesar Pura  <b>Issue date:</b> 12/04/2019       </div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
10/04/2019	ETAM19W01411	TR	305	Fill	CLAY	Pond A	1770543	5905264	-	150	~1.0m to Finished Level	238	193	210	210	1.75	29.0	1.36	2.59	8

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W01411

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below



**Tested by:**

TR

**Date tested:**

10/04/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c.:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2  Tests indicated as not accredited are outside the scope of the laboratory's accreditation <div style="text-align: right;">   <b>Approved Signatory:</b> Cesar Pura  <b>Issue date:</b> 16/04/2019       </div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
11/04/2019	ETAM19W01419	JJ	307	Fill	Silty CLAY	Gully A	17705235	5905252	-	150	At Finished Level	UTP	UTP	UTP	UTP	1.98	23.2	1.61	2.59	0



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W01419

**Page No:** 2 of 2



**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ

**Date tested:** 11/04/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c.:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2  Tests indicated as not accredited are outside the scope of the laboratory's accreditation <div style="text-align: right;">   <b>Approved Signatory:</b> Cesar Pura  <b>Issue date:</b> 18/04/2019       </div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
16/04/2019	ETAM19W01503	JJ	308	Fill	Silty CLAY	Lot 90-91	1770384	5905195	-	150	At Finished Level	143	143	147	173	1.75	50.5	1.16	2.59	0
16/04/2019	ETAM19W01503	JJ	309	Fill	Silty CLAY	Gully B	1770375	5905300	-	150	~2.5m to Finished Level	160	179	182	UTP	1.79	40.0	1.28	2.59	0

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W01503

**Page No:** 2 of 2



**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** JJ

**Date tested:** 16/04/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c.:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2  Tests indicated as not accredited are outside the scope of the laboratory's accreditation <div style="text-align: right;">   <b>Approved Signatory:</b> Cesar Pura  <b>Issue date:</b> 23/04/2019       </div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
17/04/2019	ETAM19W01517	SC	310	Fill	Silty CLAY	Gully B	1770379	5905300	-	150	~2.0m to Finished Level	209	195	182	182	1.78	36.3	1.30	2.59	2



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W01517

**Page No:** 2 of 2



**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** SC

**Date tested:** 17/04/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c.:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2  Tests indicated as not accredited are outside the scope of the laboratory's accreditation <div style="text-align: right;">   <b>Approved Signatory:</b> Cesar Pura  <b>Issue date:</b> 23/04/2019       </div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa  UTP = Unable to penetrate				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
18/04/2019	ETAM19W01523	SC	311	Fill	Silty CLAY	Gully B	1770374	5905302	-	150	~0.7m to Finished Level	199+	199+	199+	199+	1.85	31.2	1.41	2.59	2

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W01523

**Page No:** 2 of 2



**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** SC

**Date tested:** 18/04/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c.:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2  Tests indicated as not accredited are outside the scope of the laboratory's accreditation <div style="text-align: right;">   <b>Approved Signatory:</b> Cesar Pura  <b>Issue date:</b> 29/04/2019       </div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
26/04/2019	ETAM19W01564	TR	312	Fill	Silty CLAY	Pond A	1770536	5905254	-	150	At Finished Level	238	224	193	193	1.85	34.1	1.38	2.59	0
26/04/2019	ETAM19W01564	TR	313	Fill	Silty CLAY	Pond A	1770516	5905271	-	150	At Finished Level	145	155	155	175	1.75	38.1	1.27	2.59	3



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W01564

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below



**Tested by:**

TR

**Date tested:**

26/04/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c.:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2  Tests indicated as not accredited are outside the scope of the laboratory's accreditation <div style="text-align: right;">   <b>Approved Signatory:</b> Cesar Pura  <b>Issue date:</b> 21/05/2019       </div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa UTP = Unable to penetrate				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
15/05/2019	ETAM19W01828	CP	314	Fill	Clayey SILT	Refer to plan	1770100	5905526	-	150	~0.2m to Finished Level	190	145	190	199+	1.84	33.9	1.37	2.59	0
15/05/2019	ETAM19W01828	CP	315	Fill	Clayey SILT	Refer to plan	1770102	5905554	-	150	~0.2m to Finished Level	178	161	175	187	1.90	28.0	1.48	2.59	1
15/05/2019	ETAM19W01828	CP	316	Fill	Clayey SILT	Refer to plan	1770111	5905575	-	150	~0.5m to Finished Level	140	190	181	175	1.90	30.3	1.46	2.59	0

## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W01828

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:** CP

**Date tested:** 15/05/2019



<b>Client:</b> Coffey Services NZ Ltd (Auckland) <b>Address:</b> PO Box 8261, Symonds Street, Auckland 1150 <b>Attention:</b> Jade Dunne <b>c.c.:</b> Ray Berry <b>Project:</b> 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush <b>Location:</b> Flat Bush										<b>PROJECT CODE:</b> 773-ETAM00525AA <b>Page:</b> 1 of 2 <div style="display: flex; align-items: center;"> <div> <p>Tests indicated as not accredited are outside the scope of the laboratory's accreditation</p> <p>Approved Signatory: Cesar Pura</p> <p>Issue date: 28/05/2019</p> </div> </div>										
<b>Test method:</b> Test Methods in accordance with: *Shear Strength (using field Shear vane in accordance with NZGS 2001): Nuclear Densometer Testing (in accordance with NZS 4407:2015 Test 4.2): Water Content Testing (in accordance with NZS 4402:1986 Test 2.1): Moisture contents and dry densities are corrected against oven dried moisture content testing.																				
Date	Work Order No: ETAM...	Tested by	Test No.	Layer	Material tested	Location	Easting	Northing	RL (m)	Probe Test Depth (mm)	Comments	Field Shear Strength in kPa <small>UTP = Unable to penetrate</small>				Wet Density (T/m <sup>3</sup> )	Oven Water Content (%)	Dry Density (T/m <sup>3</sup> )	Solid Density (T/m <sup>3</sup> ) (Measured)	Air Voids (%)
24/05/2019	ETAM19W01950	TR	317	Fill	Silty CLAY	Refer to plan	1770393	5905343	-	150	Finished Level	141	193	193	207	1.81	30.4	1.39	2.59	4
24/05/2019	ETAM19W01950	TR	318	Fill	Gravelly CLAY	Refer to plan	1770107	5905573	-	150	Finished Level	175	175	175	163	1.85	22.0	1.52	2.59	8



## SITE PLAN

NOT TO SCALE

**Project No:** 773-ETAM00525AA

**Work Order No:** ETAM19W01950

**Page No:** 2 of 2

**Project:** 773-GENZETAM16856AB Donegal Subdivision - Stage 10, Flat Bush

**Location:** As below

**Tested by:**

TR

**Date tested:**

24/05/2019



## **Appendix D – Existing Coffey Slope Stability Assessments**

## Memorandum

To William Platts From Ray Berry  
Email address w.platts@harrisingrierson.com Date 2 April 2019  
Company Harrison Grierson Consultants Limited Reference GENZAUCK16856AB  
cc matthew@hgg.co.nz (Hugh Green) Pages 1 of 11  
Subject Donegal Stud Stage 10B, Thomas Road, Flatbush – Slope Stability in Recreation Reserve (Lot 406)

Dear Will

As requested, we have completed our assessment of the stability of the gully flank immediately below Lot 406 and adjacent to Thomas Road, as identified on the attached Site Plan. We understand that Hugh Green Limited have requested we assess the stability of the gully flank in its current landform and if found to be potentially unstable, to advise on what would be the minimum earthworks required to achieve acceptable factors of a safety against instability given the intended future use of the land.

Based on our recent conversations we also understand that in the near future this area will be the subject of more substantial earthworks involved with the upgrading and widening of Thomas Road and the associated extension of the existing culvert pipe and the filling of the head of the gully below the subject site.

Given the above, we have conducted slope stability analysis on the existing landform using the cross-section provided by Harrison Grierson Consultants Limited, refer Figure 2. The subsoil profile has been overlaid onto the cross-section using historical borehole information and our recent site observations during subdivisional earthworks in the vicinity.

For our analysis we have used the following assumed geotechnical parameters in our stability analyses:

Table 1: Assumed Geotechnical Parameters

Material	Unit Weight $\gamma$ (kN/m <sup>3</sup> )	Cohesion $c'$ (kPa)	Internal Friction Angle $\phi'$ (degrees)
Residual ECBF	17	5	30
Transitional ECBF	18.5	7	32
Bedrock ECBF	20	50	40

Table 2 below presents the results of our stability analysis, the outputs from the SLIDE analysis are attached.

Table 2: Summary of Stability Analysis Results

Cross Section	Prevailing Groundwater FoS	Elevated Groundwater FoS	Minimum Factor of Safety Satisfied
Section AA - Proposed Slope Profile	1.3	1.0	No
Section AA – Engineered Slope Profile	1.5	1.3	Yes

Based on our site observations, geological appraisal, review of existing geotechnical data and the results of our stability analyses, we have assessed that the existing gully slope located adjacent to Thomas Road does not currently meet acceptable minimum factors of safety against instability.

However, following the minor earthworks described below, this condition can be improved and adequate factors of safety should be able to achieved.

The following recommendations apply:

- The stability of the gully flank can be improved by regrading the slope to a maximum angle of 1V:2H (26.5 degrees).
- Cutting/trimming the slope will need to start at the base of the gully, specifically at the toe of the over steepened (near vertical) section of the gully flank that is located immediately adjacent to the culvert outlet. As has been highlighted previously, significant scour/erosion has occurred here to form the over-steepened grade near the base of the slope.
- The regrading of the slope is to daylight at the boundary of Lot 406.
- Regrading the slope should remove the uncontrolled fill that has previously been placed over the slope crest. In the event that uncontrolled fill remains after the cut has been completed then the remaining uncontrolled fill should be fully removed and replaced with Engineered fill.
- Once the slope has been regraded to the final slope profile the trimmed face should be stabilised with either geotextile cloth pinned to the slope or coconut mat and topsoil. This should help to reduce the likelihood of scour and erosion to the batter face.
- A clean water diversion swale and compacted clay bund should be formed at the crest of the slope to intercept and divert runoff away from the batter face and aid in preventing erosion and/ or scour. The location and extent of the diversion swale/bund should be confirmed on site by Coffey after the slope has been regraded.

## Limitations

This memo has been prepared solely for the use of our client, Hugh Green Limited, and their professional advisers in relation to the specific project described herein. No liability is accepted in respect of its use for any other purpose or by any other person or entity.

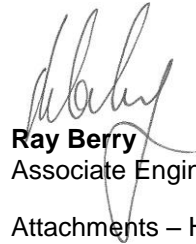


All future owners of this property should seek professional geotechnical advice to satisfy themselves as to its ongoing suitability for their intended use.

If you have any queries regarding the above, please do not hesitate to contact the undersigned.

For and on behalf of Coffey

Prepared By:



**Ray Berry**  
Associate Engineering Geologist

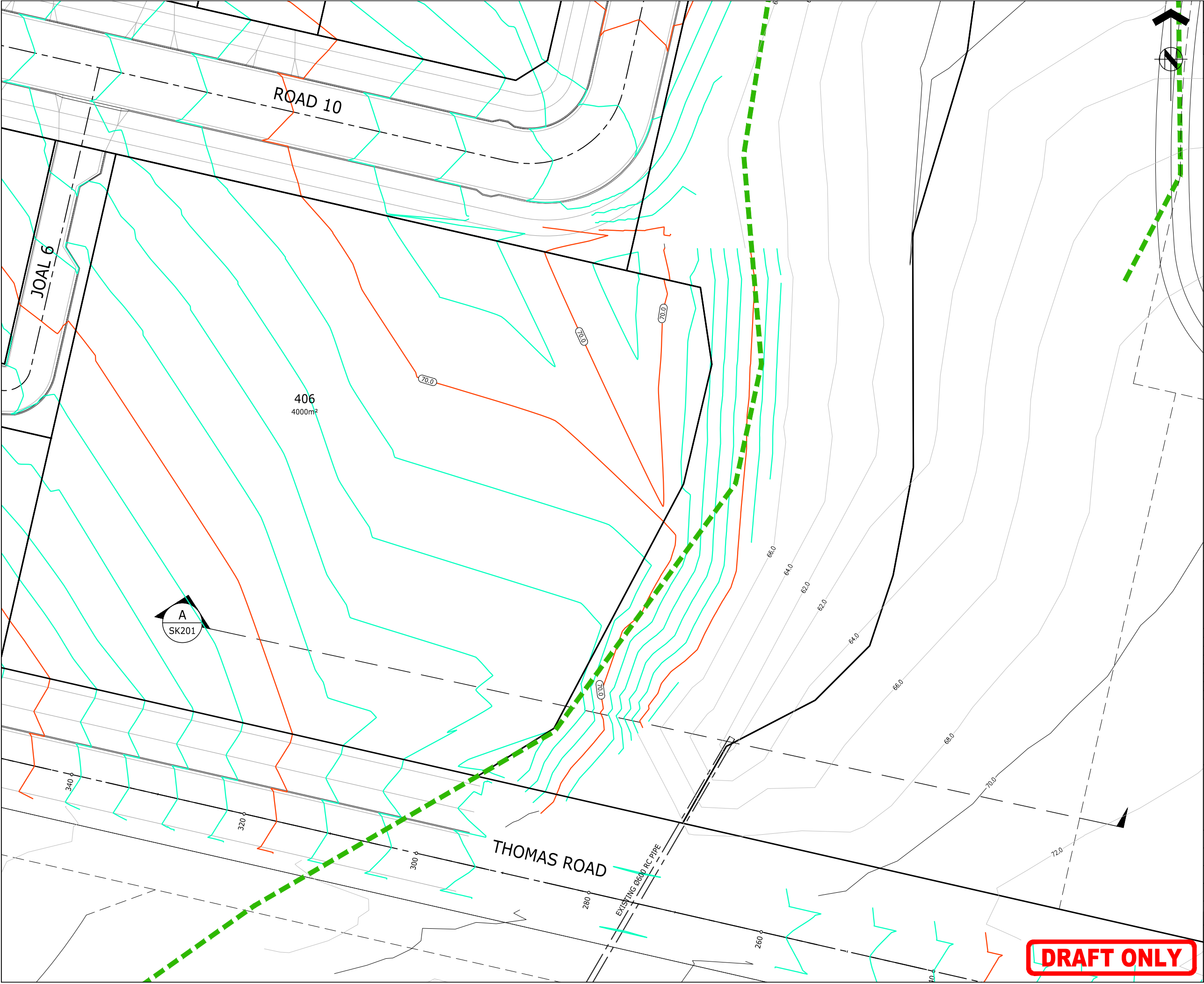
Reviewed and Authorised By:



**Peter Bosselmann**  
Senior Principal

Attachments – Harrison Grierson Consultants Limited Drawings

- Site Plan
- Cross Section
- Stability Analysis Test Results





ASSOCIATION OF CONSULTING  
ENGINEERS NEW ZEALAND

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LEGEND:

 S.E.A.



AUCKLAND OFFICE  
LEVEL 4, 96 ST GEORGES BAY ROAD  
PARNELL AUCKLAND 1052  
T +64 9 917 5000  
W www.harrisongrierson.com

1	ISSUED FOR INFORMATION	DXK	29.03.19
REF	REVISIONS	BY	DATE

PROJECT:

HUGH GREEN LIMITED  
DONEGAL STUD  
84 THOMAS ROAD, FLAT BUSH

TITLE:

LOT 406  
FINISHED CONTOURS PLAN

ORIGINATOR: DXK	DATE: 11.2018	SIGNED:	PLOT BY: DXK
DRAWN: DXK	DATE: 11.2018	SIGNED:	PLOT DATE: 29.03.19
CHECKED: WJP	DATE: 20.11.18	SIGNED:	SURVEY BY:
APPROVED: WJP	DATE: 20.11.18	SIGNED:	SURVEY DATE:



ISSUE STATUS:

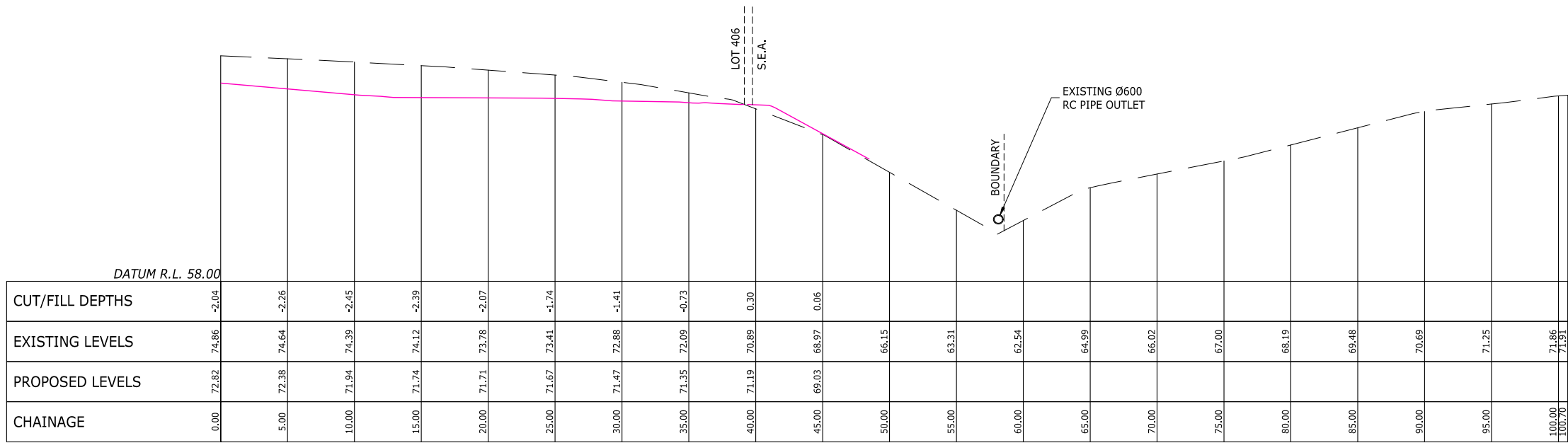
FOR INFORMATION

PROJECT No: 1050-139718-02	SCALES: 1:200-A1 1:400-A3	A1
DRAWING No: 139718-SK250	REV	1

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LEGEND:

-  PROPOSED FINISHED SURFACE
-  EXISTING GROUND LEVEL



SECTION A  
LONGSECTION BETWEEN 0.00 AND 100.70


1	ISSUED FOR INFORMATION	DXK	29.03.19
REF	REVISIONS	BY	DATE

PROJECT:

HUGH GREEN LIMITED  
DONEGAL STUD  
84 THOMAS ROAD, FLAT BUSH

TITLE:

LOT 406  
PROPOSED EMBANKMENT SECTION

ORIGINATOR: DXK	DATE: 11.2018	SIGNED:	PLOT BY: DXK
DRAWN: DXK	DATE: 11.2018	SIGNED:	PLOT DATE: 29.03.19
CHECKED: WJP	DATE: 20.11.18	SIGNED:	SURVEY BY:
APPROVED: WJP	DATE: 20.11.18	SIGNED:	SURVEY DATE:

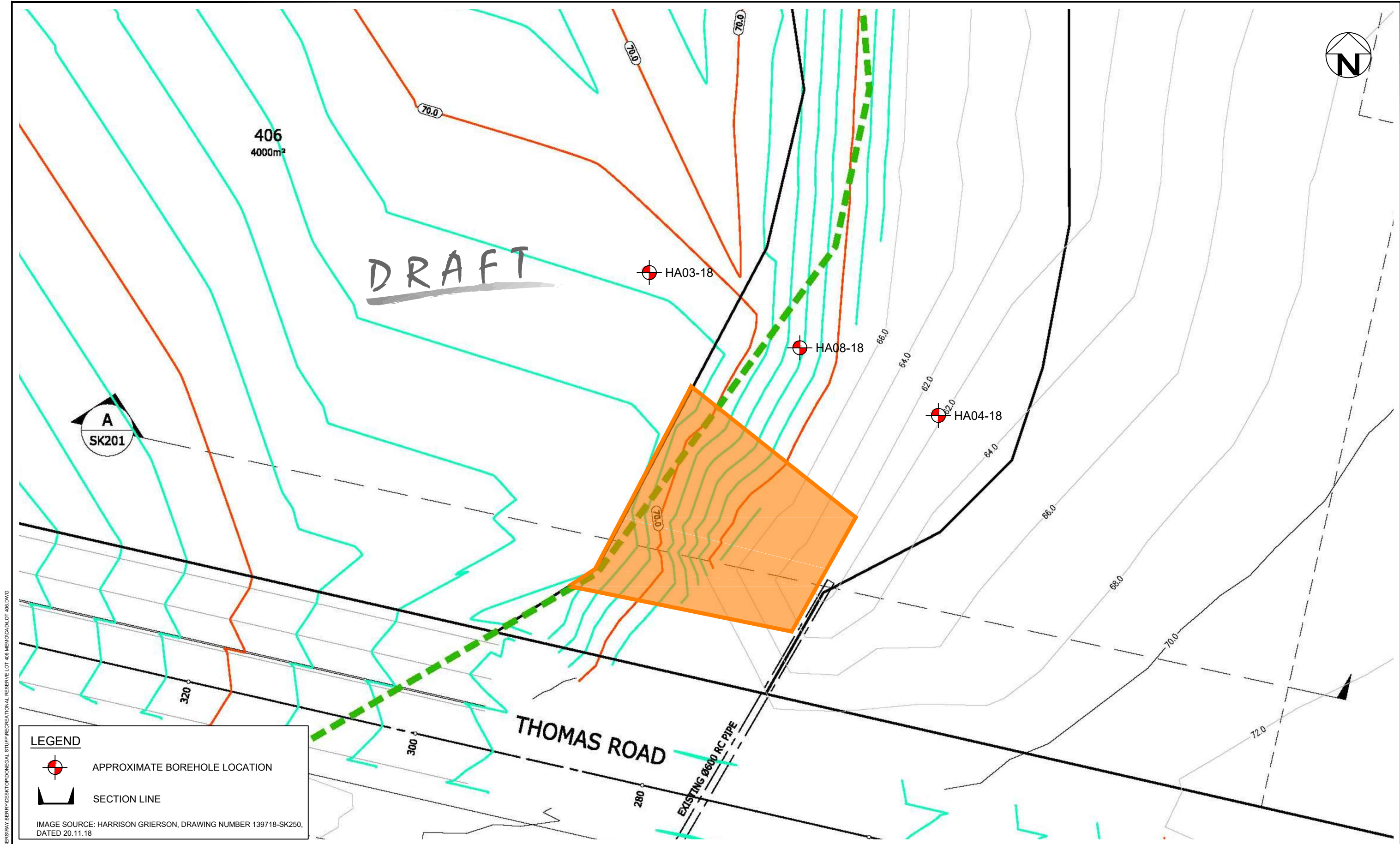
ISSUE STATUS:

FOR INFORMATION


PROJECT No:	SCALES: 1:200 (H) 1:200 (V) -A1 1:400 (H) 1:400 (V) -A3	A1
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DRAWING No:	137007-SK251	REV 1
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DRAFT ONLY



LEGEND



APPROXIMATE BOREHOLE LOCATION



SECTION LINE

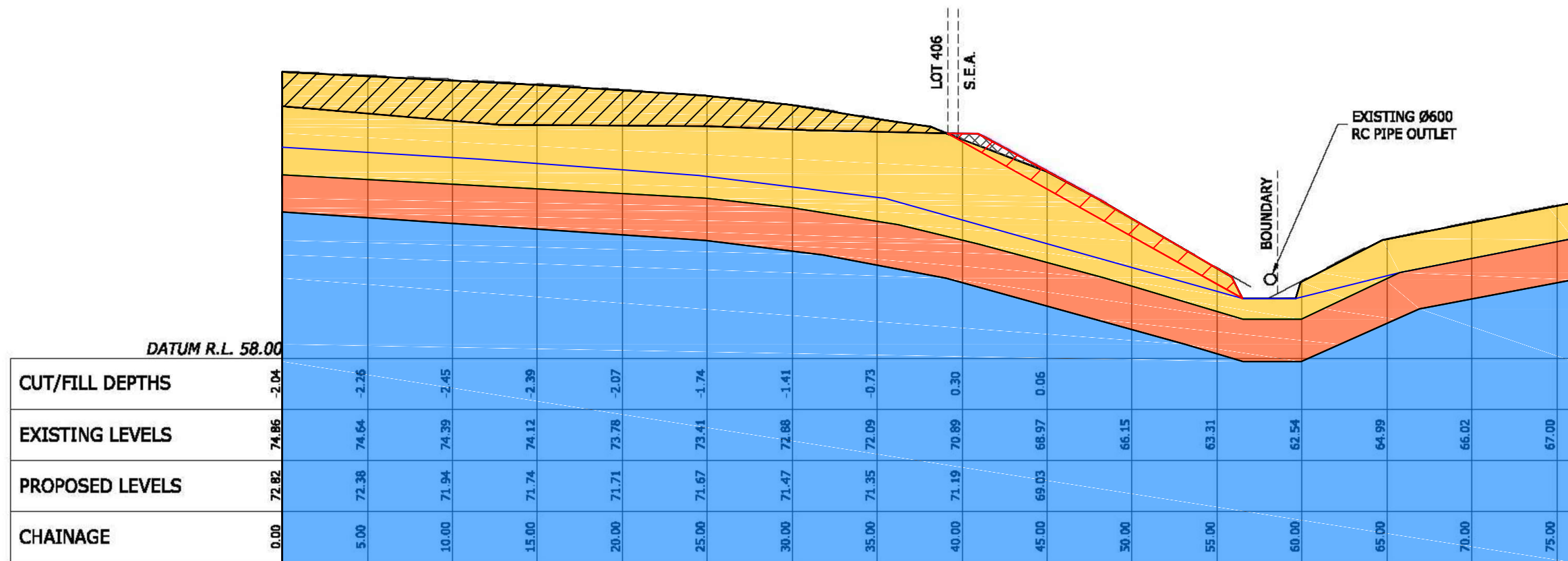
IMAGE SOURCE: HARRISON GRIERSON, DRAWING NUMBER 139718-SK250, DATED 20.11.18

revision	no.	description			drawn	approved	date	<div><div><div>06.012.018.0</div><div>Horizontal Scale (metres)</div></div><div><div>06.012.018.0</div><div>Vertical Scale (metres)</div></div></div>	drawn	RB	<div><div><div>coffey</div><div>A TETRA TECH COMPANY</div></div></div>	client:			HUGH GREEN LIMITED		
	A	ORIGINAL ISSUE							approved	PBCB		project:			LOT 406 DONEGAL STUD STAGE 10B FLAT BUSH		
									date	02.04.2019		title:			SITE PLAN		
									scale	1:300		project no:			GENZAUCK16856AB		figure no: 1
									original size	A3							rev: A

PLOT DATE: 20/04/2019 11:00:20 AM DWG FILE: C:\USERS\RAY BERRY\DESKTOP\DONEGAL STUD\RECREATIONAL RESERVE LOT 406 MEMO\CA\LOT 406.DWG



DRAFT



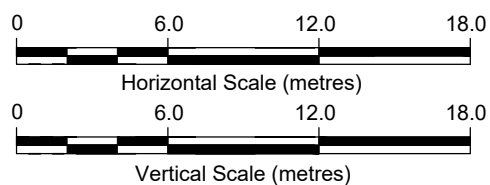
SECTION A

LEGEND

- PROPOSED CUT
- PROPOSED FILL
- PROPOSED ADDITIONAL CUT
- RESIDUAL SOIL
- TRANSITION ZONE
- BEDROCK

IMAGE SOURCE: HARRISON GRIERSON, DRAWING NUMBER 137007-SK251, DATED 20.11.18

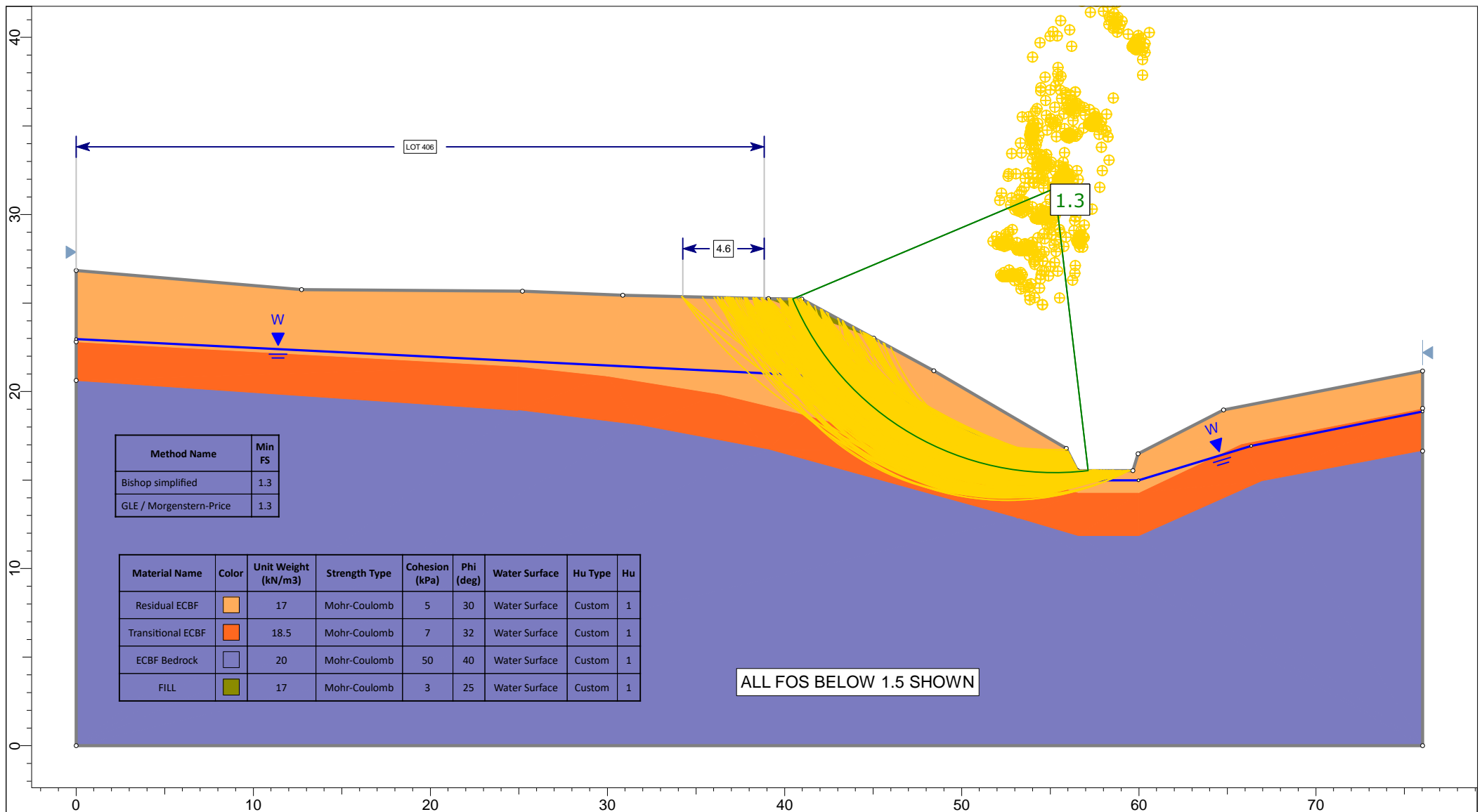
revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE			



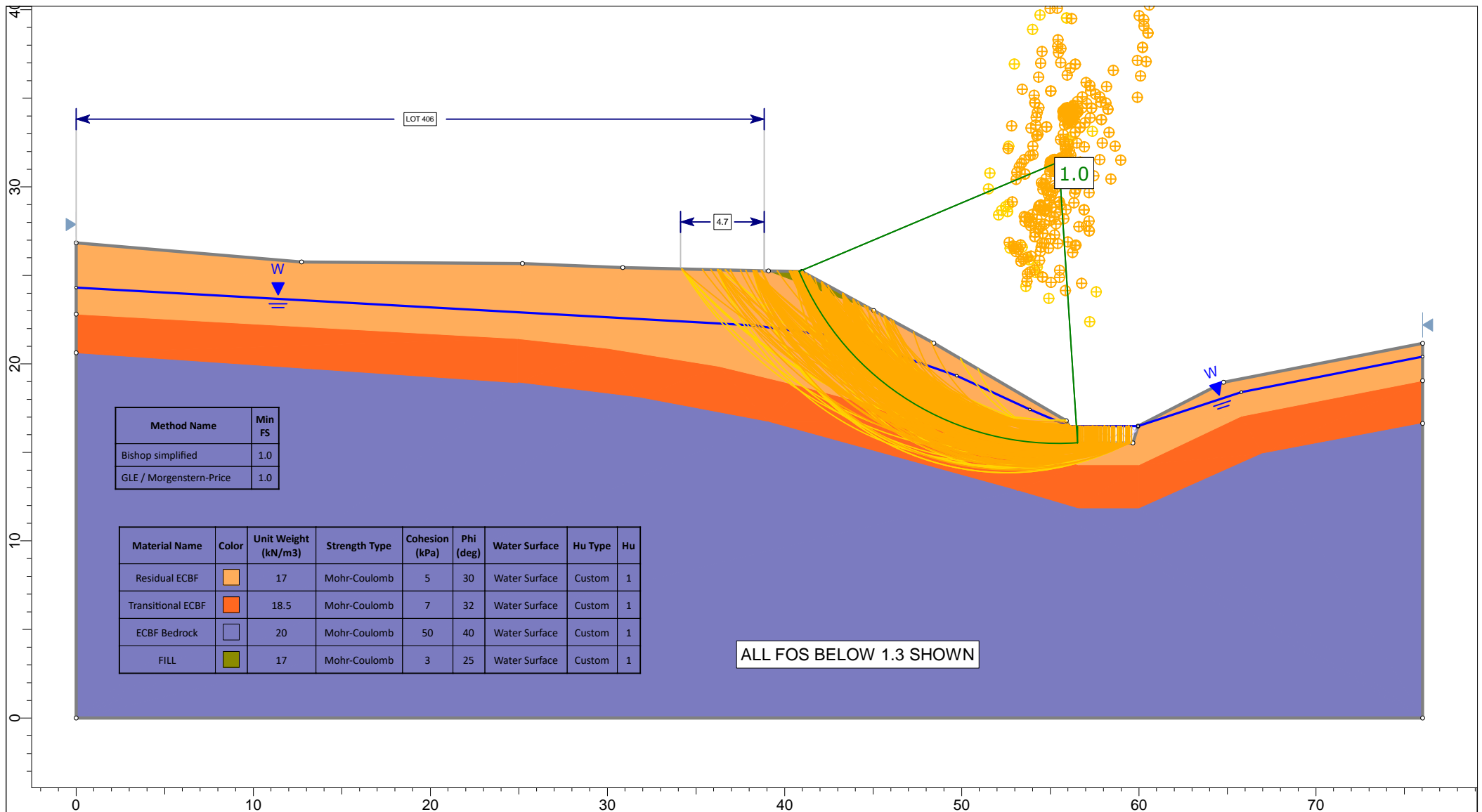
drawn	RB
approved	PBCB
date	02.04.2019
scale	1:300
original size	A3



client:	HUGH GREEN LIMITED		
project:	LOT 406 DONEGAL STUD STAGE 10B FLAT BUSH		
title:	CROSS SECTION A-A		
project no:	GENZAUCK16856AB	figure no:	2
		rev:	A

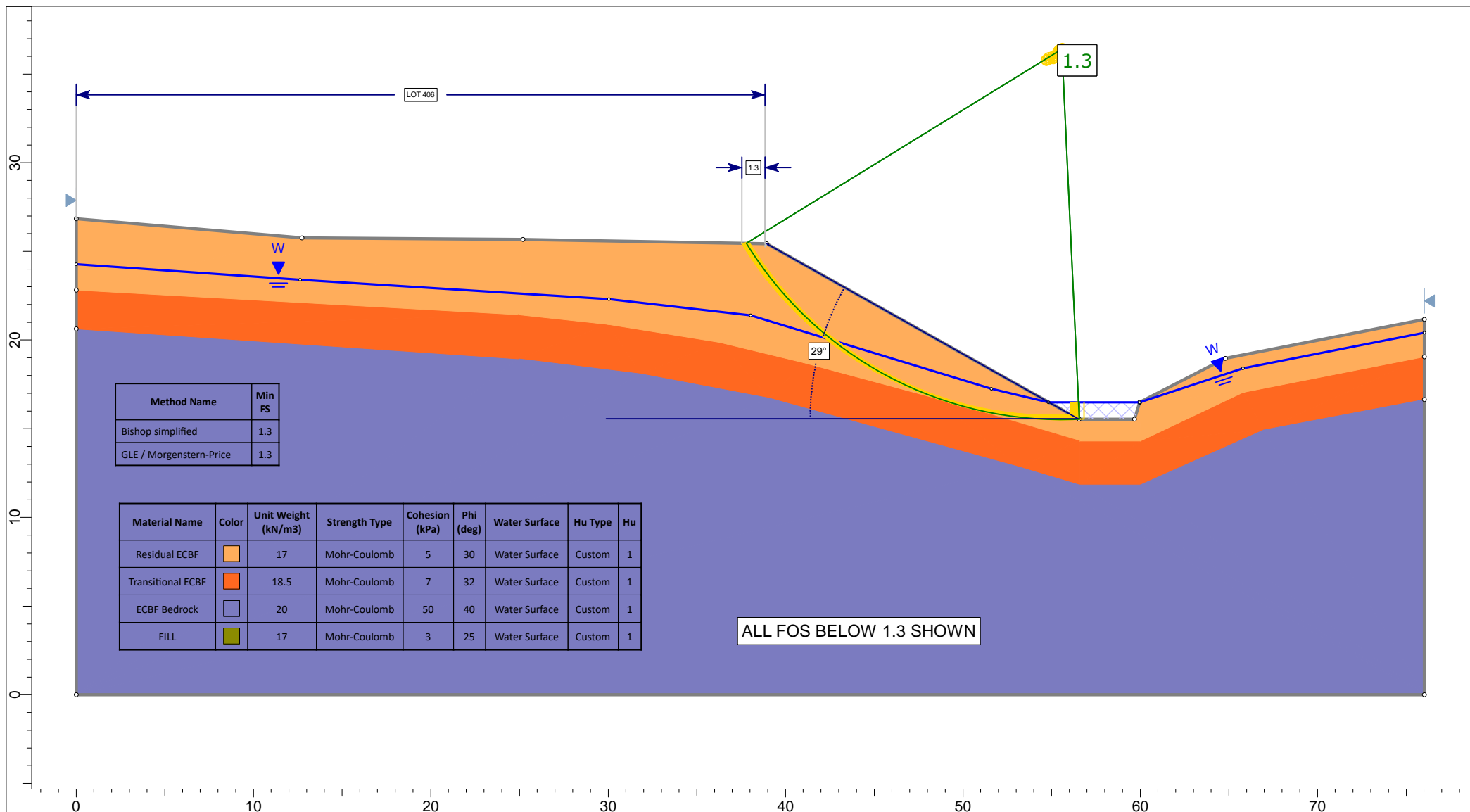


Project			LOT 406 DONEGAL STUD STAGE 10B		
Analysis Description			PROPOSED SLOPE PROFILE - PREVAILING GROUNDWATER CONDITIONS		
Drawn By	COFFEY	Scale	1:300	Company	HUGH GREEN LIMITED
Date	1/04/2019, 3:10:20 PM	File Name	LOT 406 MDSLP PRGWv2.slim		









## Memorandum

To	William Platts	From	James Livingston / Ray Berry
Email address	w.platts@harrisingrierson.com	Date	16 April 2018
Company	Hugh Green Limited	Reference	GENZAUCK16856AB
cc	matthew@hgg.co.nz	Pages	1 of 18
Subject	Donegal Stud Stage 10 – Slope Stability Assessment for Eastern and Western Boundary Gully Flanks		

## 1. Introduction and Scope of Memo

This memo summaries the results of our recent hand auger borehole investigation and slope stability analysis conducted on the gully flanks that form the eastern and western site boundaries of the Donegal Stud Stage 10 subdivision, Flat Bush. The work was undertaken in accordance with the variation to contract V01, dated 16 January 2018 and arises from the recommendations given in our earlier Geotechnical Investigation Report (GIR) reference GENZAUCK16856AA, dated 11 May 2017.

As you are aware, computer based slope stability modelling conducted for our GIR confirmed that the steep slopes confined to the gully flanks on the eastern and western boundaries were potentially unstable, particularly during short term storm events when groundwater levels are elevated. Due to the results of our analysis we categorised the site into areas that meet the Auckland Council definition of “good ground” and in-lieu of further site specific investigation and analysis, proposed that Specific Design Zones should be imposed in areas where slip surfaces encroaching into land containing residential dwellings and / or roads.

Therefore, the scope of this report is to re-examine the geotechnical suitability and stability of the land in these areas only in closer detail having regard for the nature of the current subdivision earthworks proposals, and to provide recommendations on the works as necessary to improve the slope stability of these areas.

## 2. Fieldwork

Our fieldwork for this memo was undertaken on 23 January and involved the drilling of nine hand auger boreholes (HA1 and HA2 to HA10) in the positions shown on the attached site plan. Four cross-sections (AA to DD) were also measured and these are attached. The inferred stratigraphy from the boreholes has been superimposed onto the cross-sections.

### 3. Investigation Findings

Typical ground conditions are summarised on the attached cross-sections. Details are as follows:

Topsoil was encountered to depths of up 0.6 metres in areas adjacent to the bunds at the edge of the site boundary, however, generally topsoil depths ranged between 0.1 and 0.3 metres.

Underlying the topsoil silty clays, clayey silts and mixtures of silts and sands of the alluvial Puketoka Formation were encountered. Shear strengths within these materials ranged from 65 kPa to 200 kPa indicating a stiff to very stiff material.

Underlying the Puketoka Formation soils, residual silts and sands of the East Coast Bays Formation were encountered. Shear strengths measured within these materials ranged from 57 kPa to in excess of 200 kPa. As the hand augers were progressed, Transitional Zone substrata (intermediate between the residual soils and the underlying Waitemata Group bedrock). The hand auger boreholes could not penetrate these materials and were terminated a short depth into them. Dynamic Cone Penetrometer (DCP) Testing performed from the bases of the boreholes met refusal indicating dense material.

Colluvial soils (slip debris) were inferred underlying the topsoil within borehole HA10, this hand auger was drilled at mid slope where we have inferred a historic slip has occurred. Shear strengths within these soils ranged from 57 to 96 kPa.

Although not encountered in our boreholes, mullock and soft saturated alluvial soils deposited during recent and successive flood events typically extend from the embankment toes to the current stream inverts. This material should not be relied on for toe support in the design of the slope stabilisation works.

There is also a layer of wet, lower strength material from 1.7 to 2.4m depth (below existing ground level) at the location of hand auger borehole HA01-18. Any shear keys constructed in this part of the site should extend below this layer.

### 4. Stability Analysis

#### 4.1. Methodology

The four measured cross-sections (AA to DD) have been chosen for our analysis because they represent the 'worst case' for stability analysis, having a combination of the steepest slopes, greatest distance between crest and toe, and low strength soils.

Theoretical failure of the slope occurs when the Factor of Safety (FOS) is 1.0, while increasing values above 1.0 indicate improved stability. We have assessed the slopes against a minimum FOS of 1.5 for prevailing or existing groundwater conditions, and 1.3 under temporary elevated groundwater conditions. For slopes requiring geotechnical treatment a FOS of 1.5 for both elevated and prevailing groundwater conditions was required.

The slope stability assessment has been undertaken using the software SLIDE (RocScience version 7), using the GLE/Morgenstern Price method.

Factors of safety were initially assessed for the existing slope and proposed slope (in the case of section AA). Where the FOS did not meet the required criteria or failure surfaces encroached beyond the site boundary and into roads or building platforms then geotechnical remedial earthworks were

modelled. The proposed remedial earthworks include re-grading of the existing slope, and / or the construction of a shear key at the base of the slope.

The table below presents the assumed soil parameters used in our analyses:

Table 1: Material Properties

Material	Unit Weight $\gamma$ (kN/m <sup>3</sup> )	Cohesion $c'$ (kPa)	Internal Friction Angle $\phi'$ (degrees)
Colluvium	17	0	25
Puketoka Formation	17	5	28
Residual ECBF	17	5	28
Transitional ECBF	18.5	7	32
Shear Key Fill (Certified clay fill)	18	5	28
Shear Key Fill (SPR)	19	1	38
Reserve Fill (Section AA)	17.5	3	28
Low Strength PKF (Section AA)	17	3	26

## 4.2. Stability Results

The table below presents the results of our stability analysis, outputs from SLIDE are also attached.

Cross Section	Prevailing Groundwater FoS	Elevated Groundwater FoS	Minimum Factor of Safety Satisfied
Section AA	1.39	1.17	No
Section AA – Proposed Slope	1.33	1.20	No
Section AA – Proposed Slope with Shear Key and Drainage Blanket	>1.5	>1.5	Yes
Section BB	1.38	1.19	No
Section BB – Regraded Slope	>1.5	>1.5	Yes
Section CC	1.5	1.15	No
Section CC – Regraded Slope (1V:3H)	>1.5	>1.5	Yes
Section DD	0.33	0.23	No
Section DD – With Clay Fill Shear Key	>1.5	>1.5	Yes
Section DD – With SPR Shear Key and Regraded Slope	>1.5	>1.5	Yes

## 4.3. Evaluation and Recommendations

Based on our site observations, geological appraisal, review of existing geotechnical data, and the results of our recent hand auger borehole investigation and stability analyses as described herein, we have assessed that the existing gully slopes located along the eastern and western boundaries of the



Donegal Stud Stage 10 subdivision do not have the required minimum factors of safety against instability and have the potential to become unstable, particularly when groundwater levels are elevated during short term storm events.

In order to achieve the required minimum FOS, particularly under elevated groundwater conditions, a range of geotechnical measures will need to be implemented. The extent of these measures is shown on the attached Earthworks Plan (Figures 6 and 7). The approximate dimensions of shear keys and location of drainage blankets and underfill drains are shown on the attached stability outputs.

Specific comments and recommendations follow:

#### **4.3.1. Cross Section A-A**

Factors of safety for Section A-A initially did not meet the required criteria. To achieve the required criteria a shear key was modelled at the base of the proposed fill embankment. The shear key at this location should be at least 4 metres in width, 3 metres deep and founded within competent very stiff natural soils. The shear key should be constructed in either compacted Soft Pit Run (SPR), or GAP65 hardfill, or suitable rock boulder fill.

Following the construction of the shear key a drainage blanket should be placed on the existing ground surface behind the shear key. The drainage blanket should comprise a 300mm thickness of compacted hardfill (GAP65). Following the construction of the drainage blanket, reserve fill may be placed to form the proposed batter, which should be no steeper than 18 degrees (1V:3H)

We understand that the batter is to be mulched and planted out on completion.

#### **4.3.2. Cross Section B-B**

Factors of safety for Section B-B initially did not meet the required criteria, however, the effect of re-grading the slope from its existing gradient to approximately 14 degrees should be effective in achieving the required minimum factor of safety. To achieve this outcome our analysis indicated that the existing slope from the tree drip line to the edge of the adjacent reserve area should be trimmed to form an even grade of approximately 14 degrees or 1V:5H.

#### **4.3.3. Cross Section C-C**

Factors of safety for Section C-C initially did not meet the required criteria. As discussed above for section B-B, the effect of re-grading the slope to an even grade to approximately 15 degrees should be effective in achieving the required minimum, factor of safety. As with cross section B-B, our analysis indicated that the existing slope from the tree drip line to the edge of the adjacent road reserve and reserve area should be trimmed to form an even grade of approximately 14 degrees or 1V:5H.

#### **4.3.4. Cross Section D-D**

Factors of safety for Section D-D initially did not meet the required criteria and accordingly two shear key options were then modelled with both achieving acceptable factors of safety. Both options comprise a 5m wide shear key that should expose very stiff soils at the base:

1. Option 1 involves the construction of a shear key using Engineer certified clay fill. Underfill drainage will be required to run through the shear key outletting at the edge of the watercourse. The underfill drains should comprise perforated Hiway grade drain coil placed in 300mm deep trenches fully lined with Bidim A19 geotextile cloth and filled with drainage metal (e.g 20/7 scoria

or SAP50 scoria) spaced at 5 metre centres. The underfill drains will need to be installed part way through the backfilling of the shear key at a level to be confirmed by Coffey during construction. Depending on site and groundwater conditions it may be necessary to form the lower half of the shear key with SPR.

2. Option 2 involves the construction of a shear key using Soft-Pit-Run (SPR) and regrading the slope with reserve (lower spec) fill. Prior to placement of the reserve fill, underfill drains spaced at 5 metres centres should be installed, these should comprise perforated Hiway grade drain coils placed in 300mm deep trenches fully lined with Bidim A19 geotextile cloth and filled with drainage metal (e.g 20/7 or SAP50 scoria).

## **4.4. Earthworks Operations**

### **4.4.1. Site Preparation**

Topsoil and uncertified fill should be stripped from all cut and fill areas. Stripping operations should be planned to extend well beyond cut and fill lines to avoid peripheral fill contamination and stockpiles of topsoil and unsuitable materials should be sited well clear of the works on suitable.

### **4.4.2. Material Suitability**

Earthworks operations involving materials from the benching and undercutting works should be relatively straightforward. The material used to form the final slope may comprise relatively clean, organic alluvial clayey silts and silty clays containing minor amounts of basalt rock (up to 100mm diameter) provided that the fill does not encroach into road reserves or building platforms.

These materials will likely to be wet of optimum and appropriate conditioning (ie. discing, mixing, drying, etc.) will be required to achieve the compaction specification.

This material cannot be classified as Class A fill due to its variable content, however, provided it is placed to a corrected undrained shear vane of 80kPa (minimum) we envisage the final material (Reserve Fill) will allow for lightweight structures such as footpaths to be formed across it. Therefore, the extent and location of this fill material must be accurately surveyed and should be shown on the final as-built drawings.

### **4.4.3. Benching of Slopes**

Benching of the existing slope as part of reforming the slope in Engineered fill should be conducted in accordance with the normal requirements of NZS 4404 and related documents. All slope benching should be the subject of Engineering inspections prior to the placement of any filling.

Groundwater seepages/springs are likely to be exposed during the benching of the slope and additional subsoil/underfill drainage works such as the installation of additional subsoil/underfill drainage measures may be needed.

### **4.4.4. Existing Filling**

Existing filling may be encountered as the site is being stripped of topsoil and benched ready to receive filling. The nature and quality of this filling is unknown, and it may be required to be reworked.

#### 4.4.5. Unsuitables

Any identifiable deposits of unsuitable materials that are considered unfit for reworking should be undercut and disposed of off the site or on topsoil stockpiles if appropriate.

#### 4.4.6. Vegetation Cover

The regraded slopes and fill batters should be vegetated with new plantings. The contribution of appropriate vegetation cover to slope stability and erosion control should not be underestimated.

### 5. Limitations

This memo has been prepared solely for the use of our client, Hugh Green Limited, and their professional advisers in relation to the specific project described herein. No liability is accepted in respect of its use for any other purpose or by any other person or entity. All future owners of this property should seek professional geotechnical advice to satisfy themselves as to its ongoing suitability for their intended use.

For and on behalf of Coffey

Prepared By:



**James Livingston**  
Geotechnical Engineer



**Ray Berry**  
Associate Engineering Geologist

Reviewed and Authorised By:

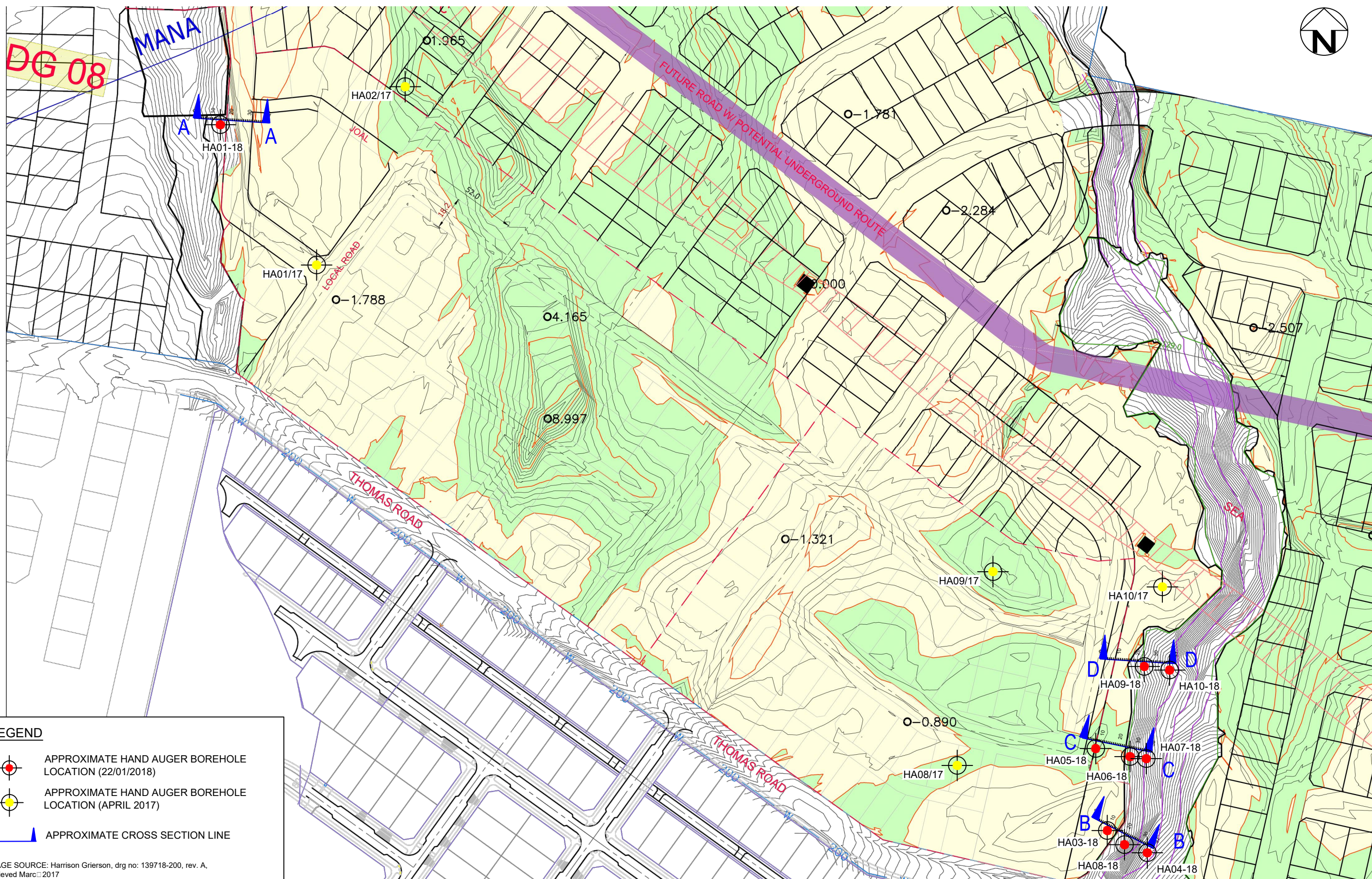


**Peter Bosselmann**  
Senior Principal

Attachments – Geotechnical Drawings and Cross-Sections  
– Slope Stability Test Results



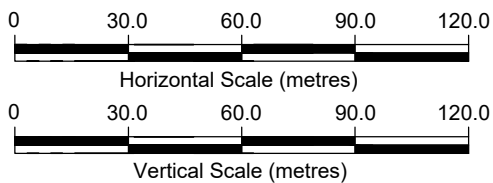
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- APPROXIMATE HAND AUGER BOREHOLE LOCATION (22/01/2018)
  - APPROXIMATE HAND AUGER BOREHOLE LOCATION (APRIL 2017)
  - APPROXIMATE CROSS SECTION LINE

IMAGE SOURCE: Harrison Grierson, drg no: 139718-200, rev. A, retrieved March 2017

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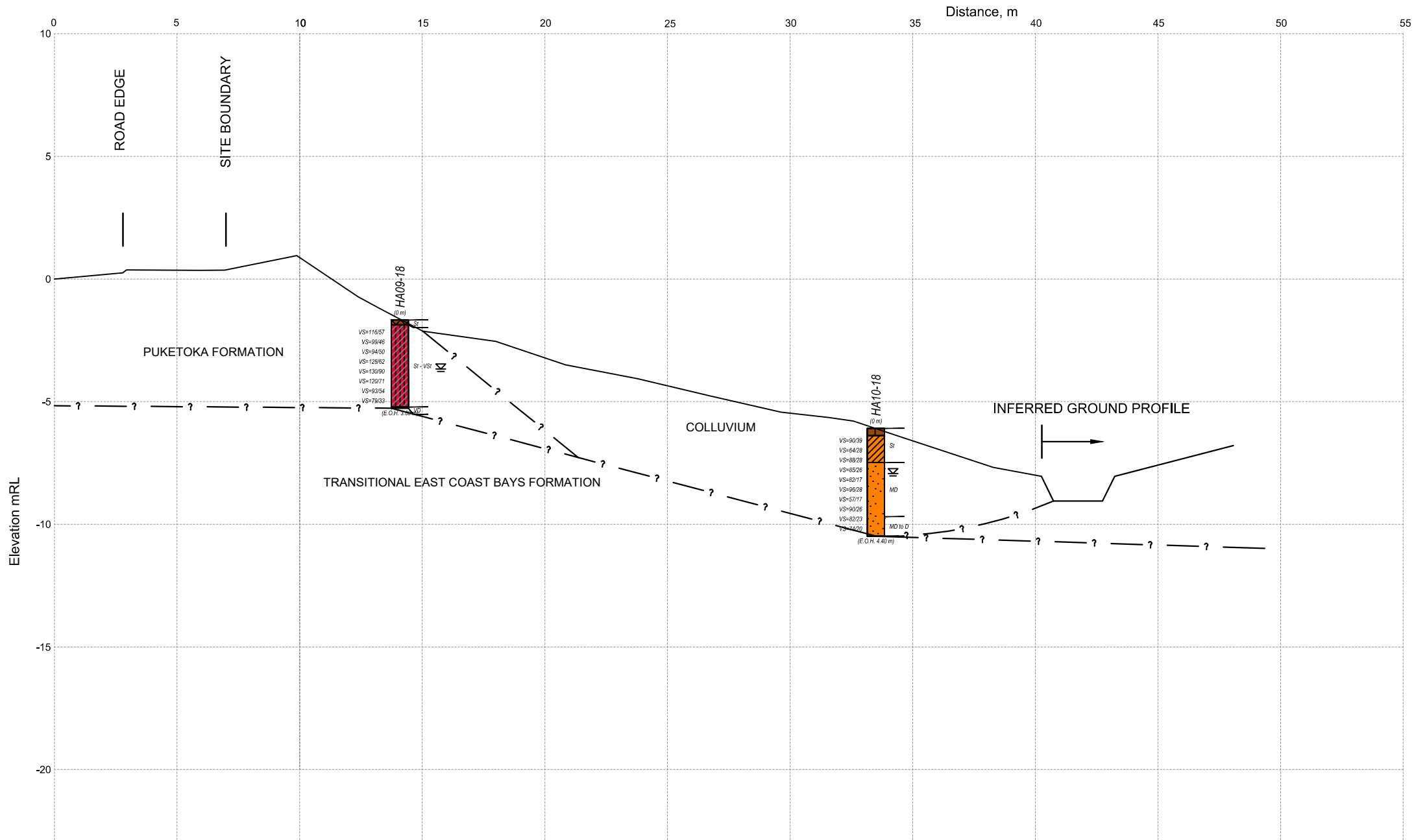
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project:	DONEGAL STUD STAGE 10 64 THOMAS ROAD, FLAT BUSH		
title:	SITE INVESTIGATION PLAN		
project no:	GENZAUCK16856AB	figure no:	01
rev:	A		



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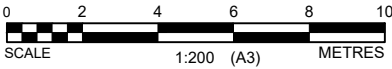


LEGEND

- EXISTING GROUND LEVEL
- GROUND WATER LEVEL
- INFERRED LITHOLOGICAL BOUNDARY
- COFFEY HAND AUGER BOREHOLE

- PROJECT UNIT
- TOP SOIL
  - COLLUVIUM
  - PUKETOKA FORMATION
  - RESIDUAL EAST COAST BAYS FORMATION
  - TRANSITIONAL EAST COAST BAYS FORMATION

- MATERIAL GRAPHIC
- TOPSOIL
  - SILTY CLAY
  - CLAYEY SILT
  - SILT
  - SANDY SILT
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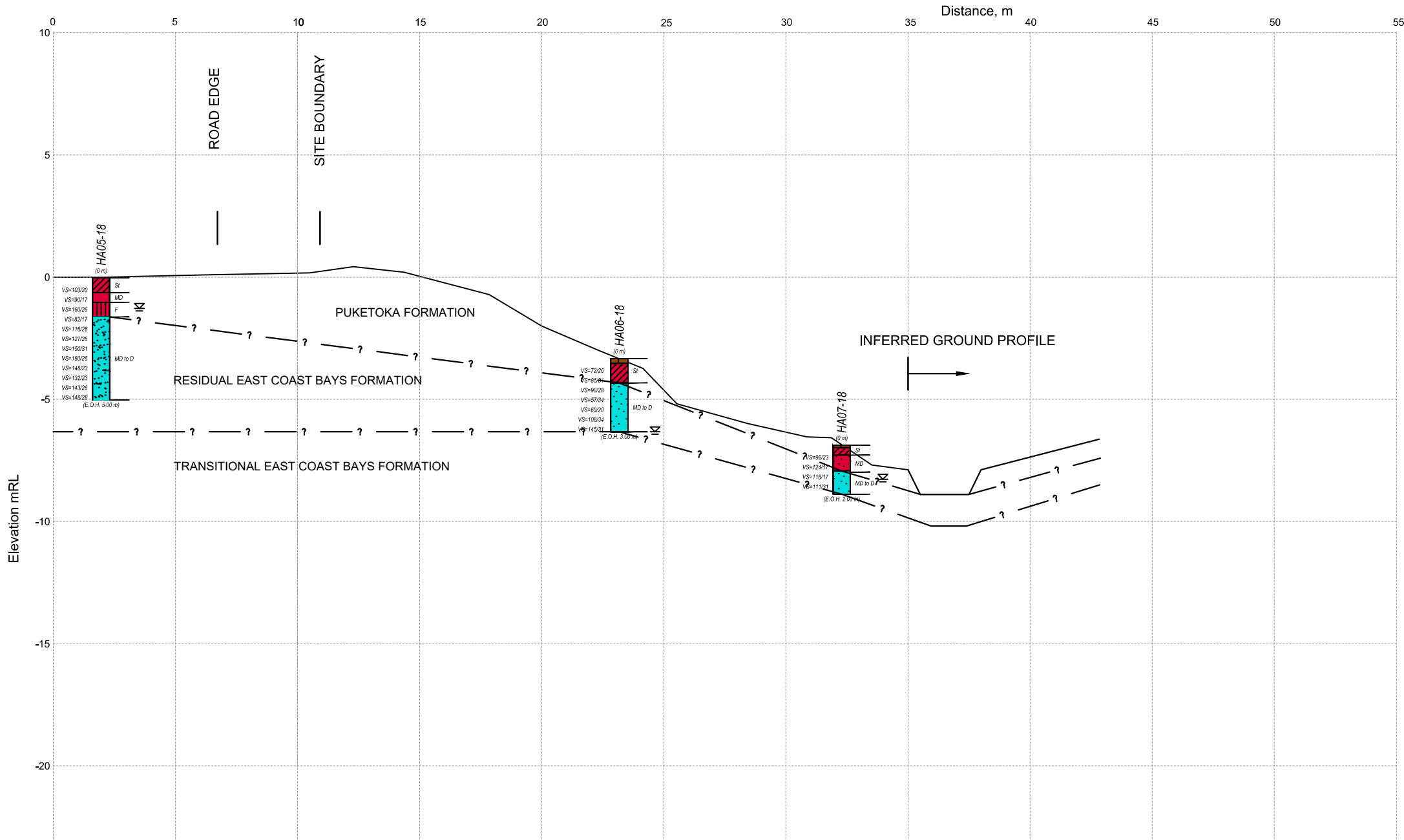


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project:	DONEGAL STUD STAGE 10 64 THOMAS ROAD FLAT BUSH		
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project no:	773-GENZAUCK16856AB	figure no:	5
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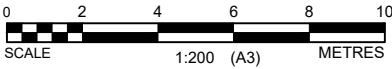


LEGEND

- EXISTING GROUND LEVEL
- GROUND WATER LEVEL
- INFERRED LITHOLOGICAL BOUNDARY
- COFFEY HAND AUGER BOREHOLE

- PROJECT UNIT
- TOP SOIL
  - COLLUVIUM
  - PUKETOKA FORMATION
  - RESIDUAL EAST COAST BAYS FORMATION
  - TRANSITIONAL EAST COAST BAYS FORMATION

- MATERIAL GRAPHIC
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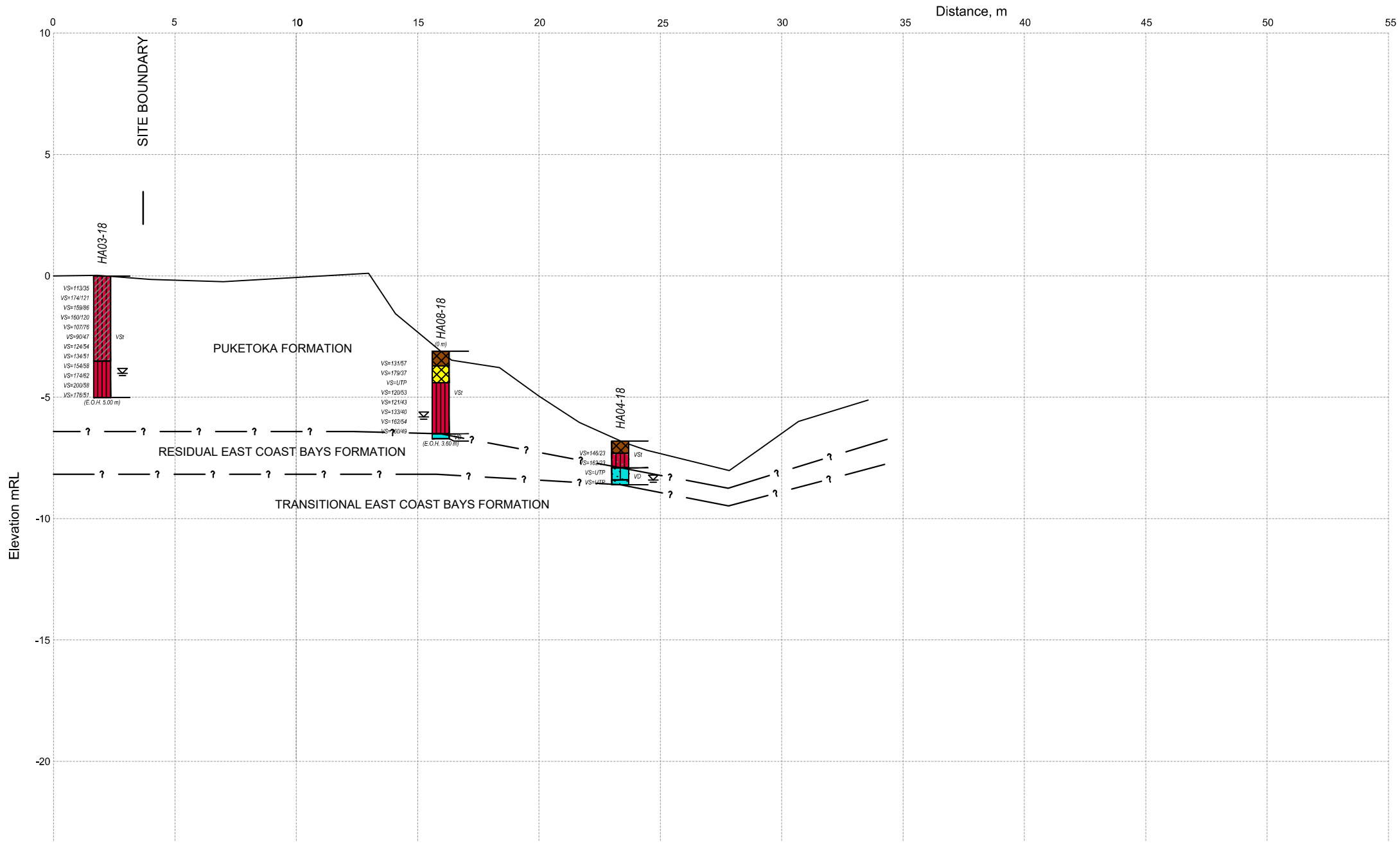
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LEGEND

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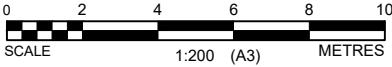
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- PUKETOKA FORMATION
- RESIDUAL EAST COAST BAYS FORMATION
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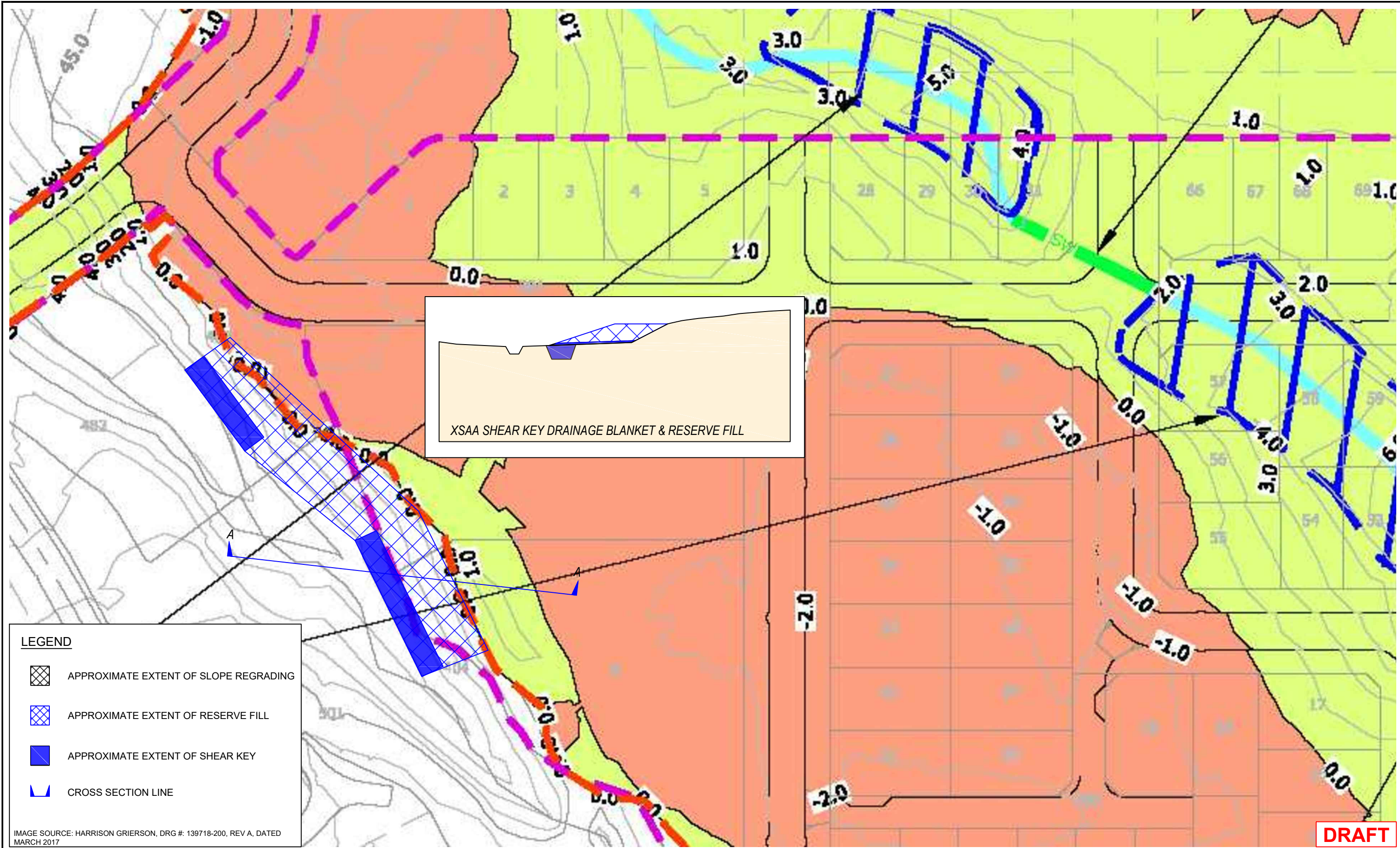
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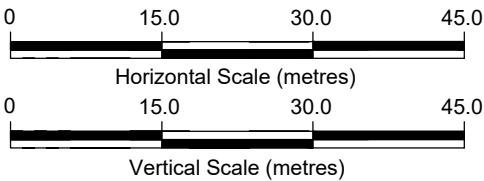


**LEGEND**

- APPROXIMATE EXTENT OF SLOPE REGRADING
- APPROXIMATE EXTENT OF RESERVE FILL
- APPROXIMATE EXTENT OF SHEAR KEY
- CROSS SECTION LINE

IMAGE SOURCE: HARRISON GRIERSON, DRG # 139718-200, REV A, DATED MARCH 2017

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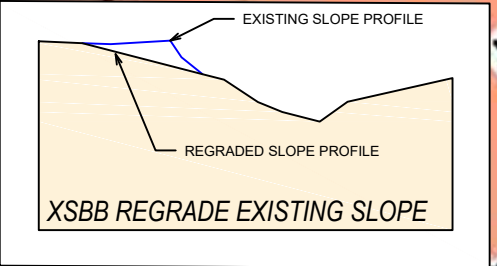
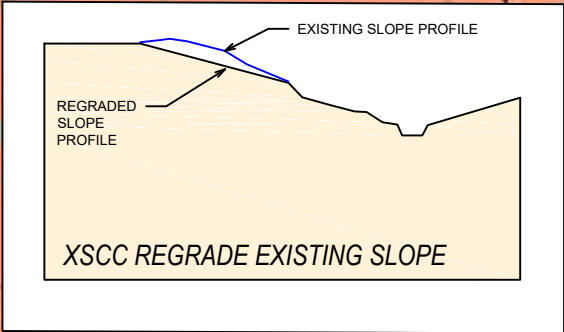
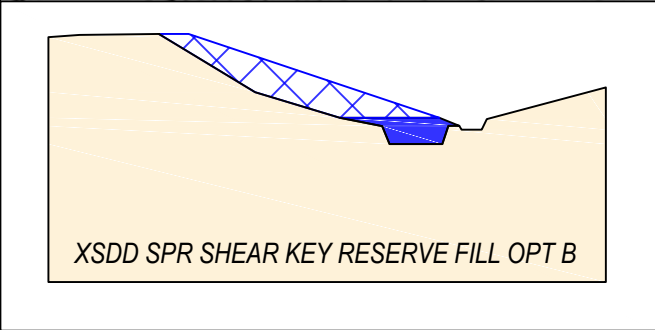
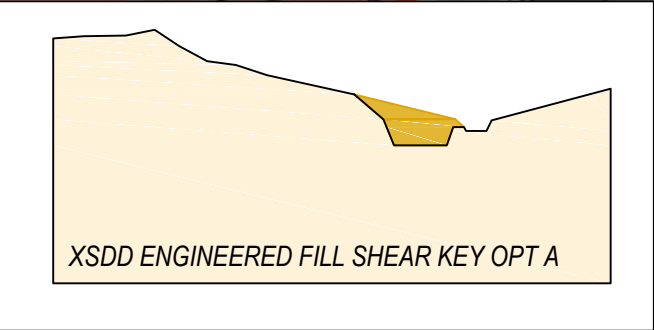
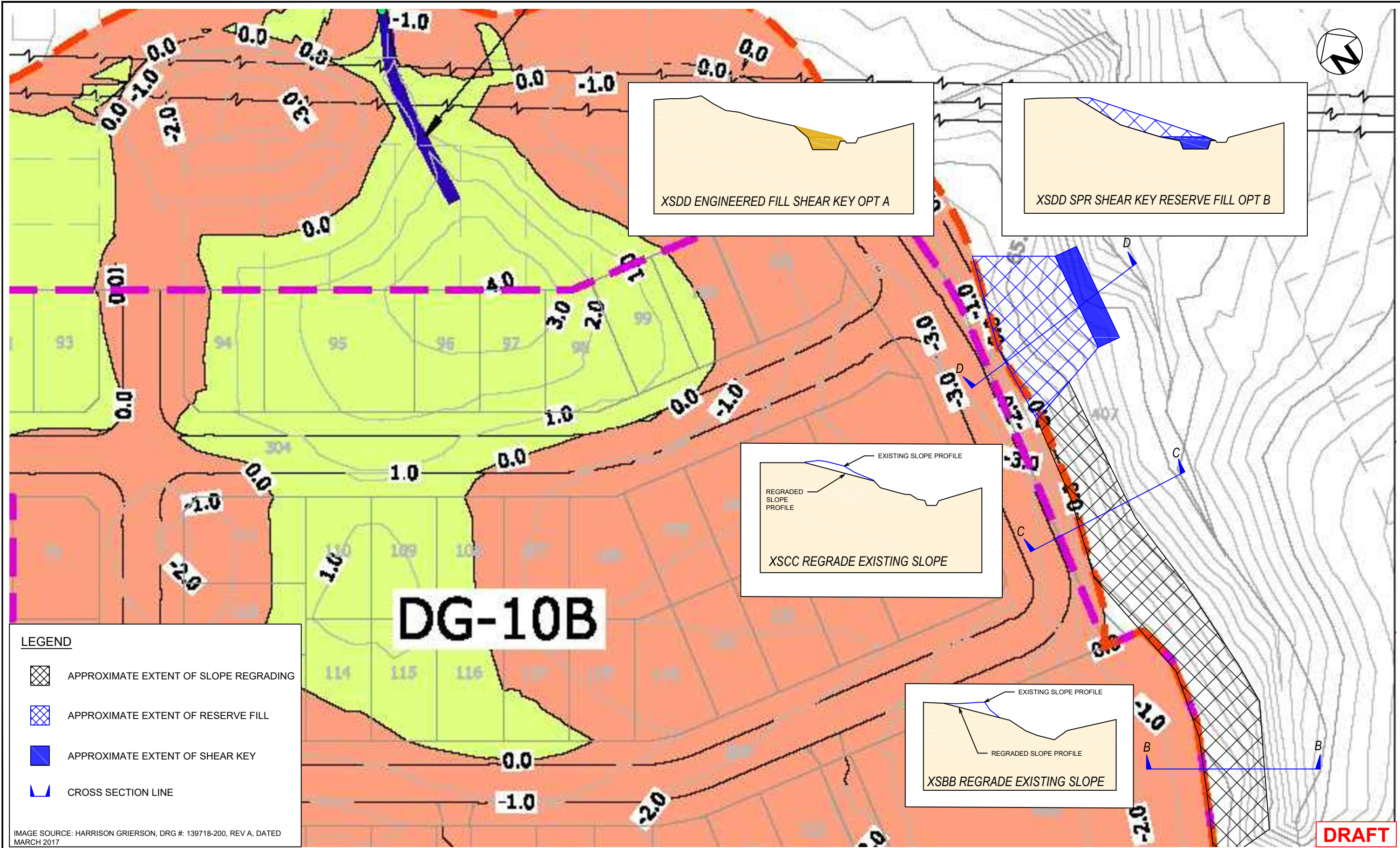
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client:	HUGH GREEN LIMITED		
project:	DONEGAL STUD STAGE 10 THOMAS ROAD AUCKLAND		
title:	EARTHWORK PLAN - EASTERN BOUNDARY		
project no:	GENZAUCK16856AB	figure no:	6
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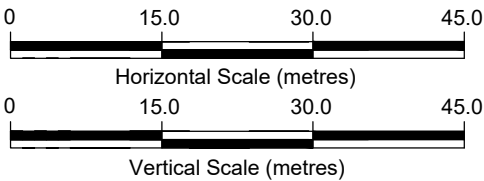


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- APPROXIMATE EXTENT OF SLOPE REGRADING
  - APPROXIMATE EXTENT OF RESERVE FILL
  - APPROXIMATE EXTENT OF SHEAR KEY
  - CROSS SECTION LINE

IMAGE SOURCE: HARRISON GRIERSON, DRG #: 139718-200, REV A, DATED MARCH 2017

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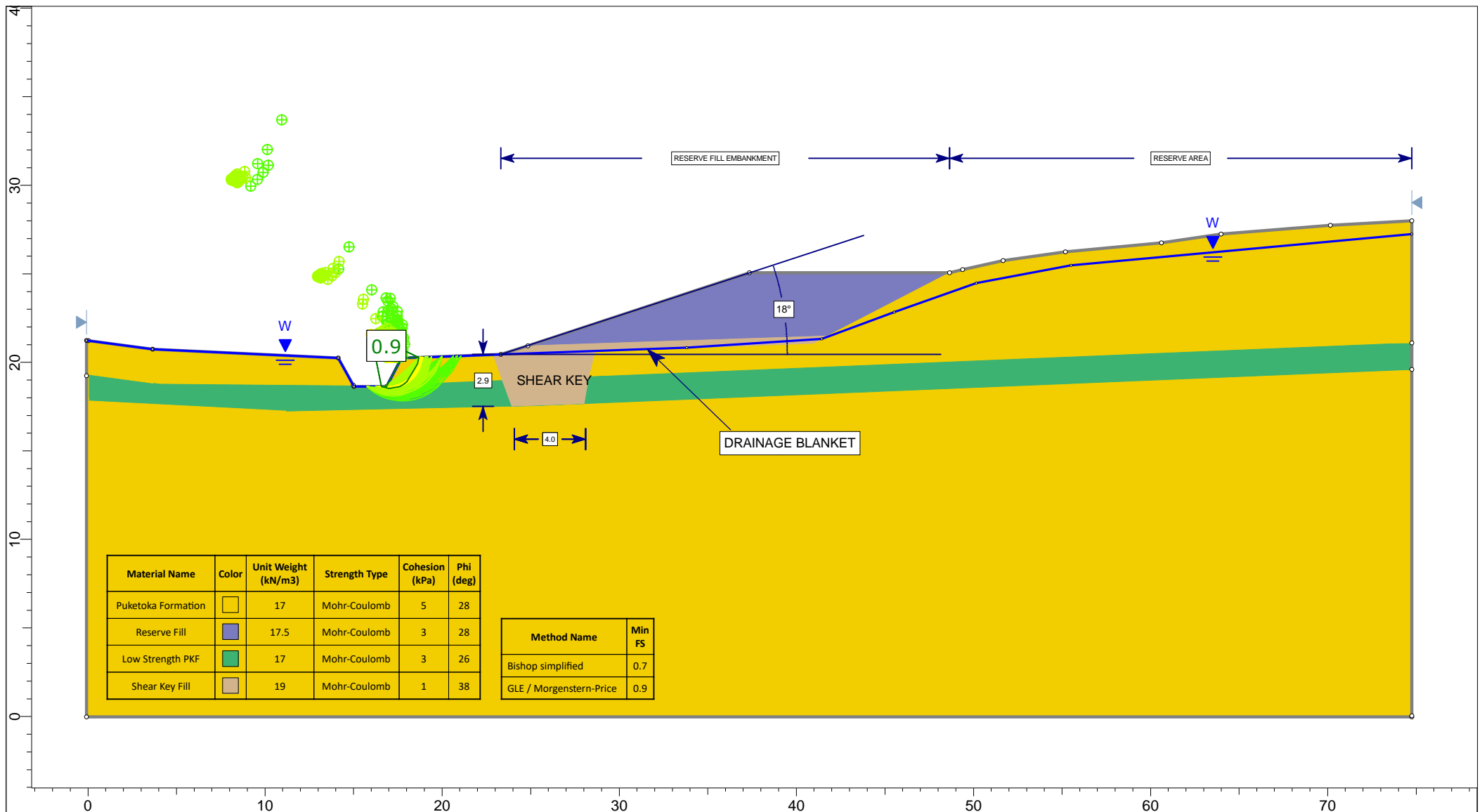


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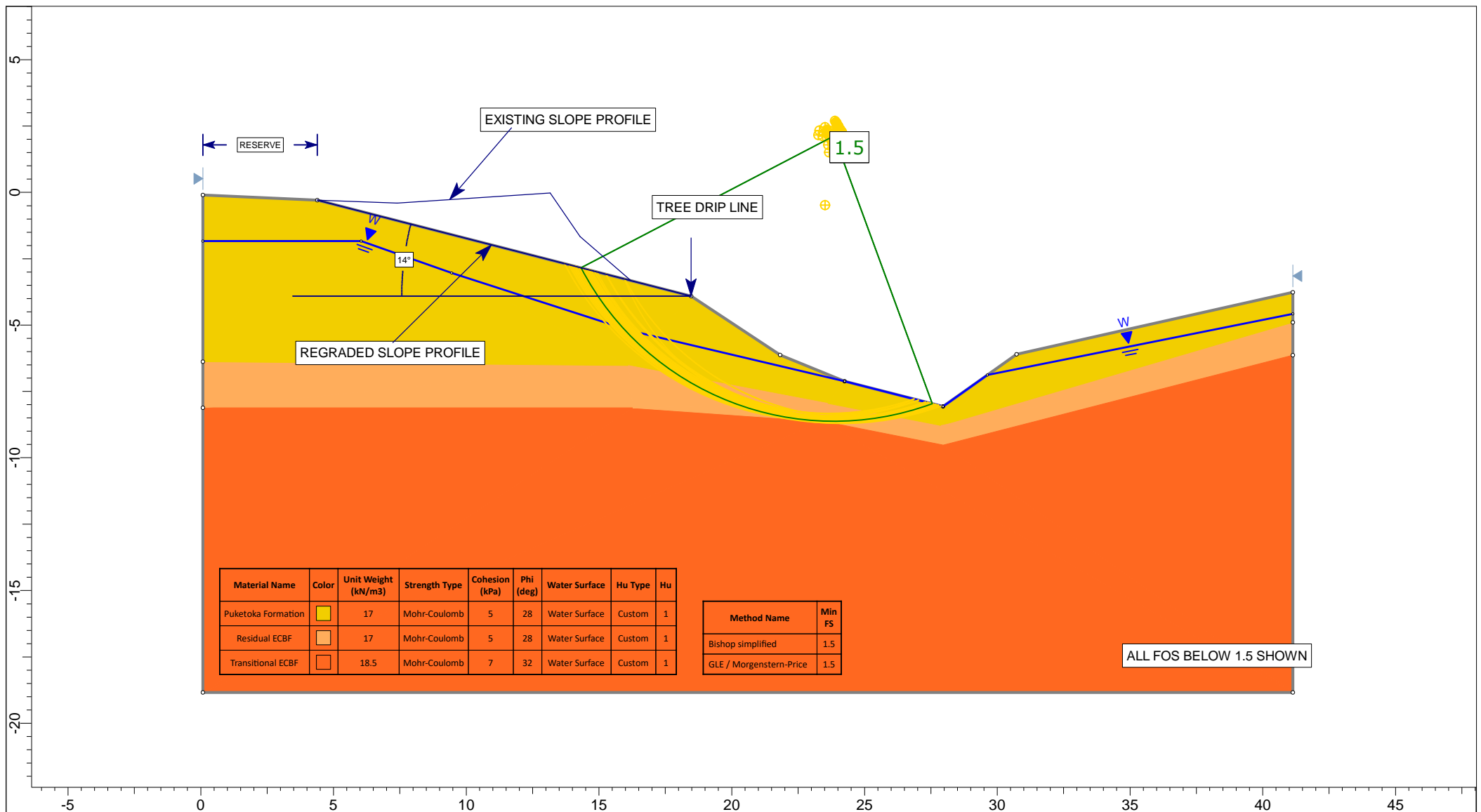


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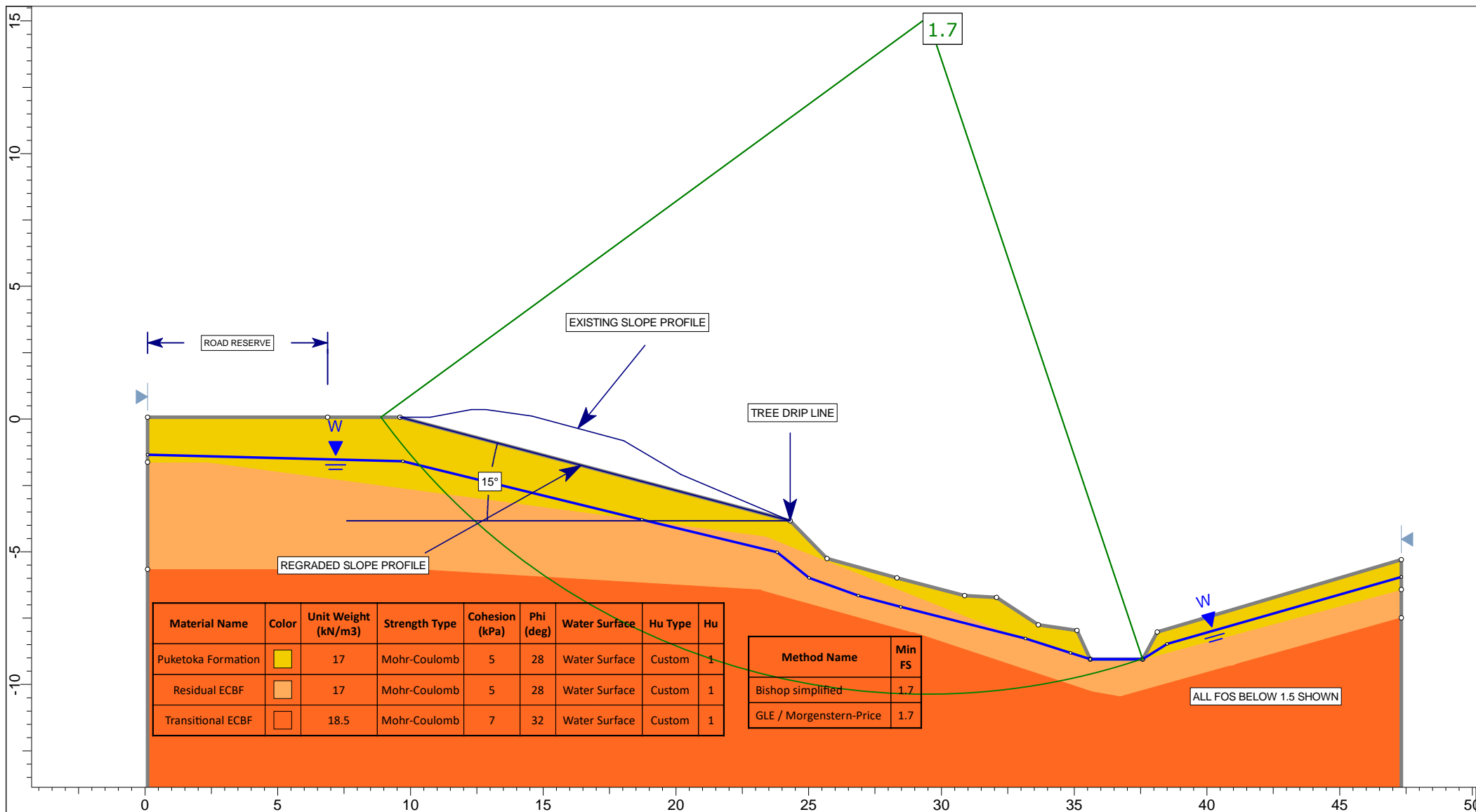
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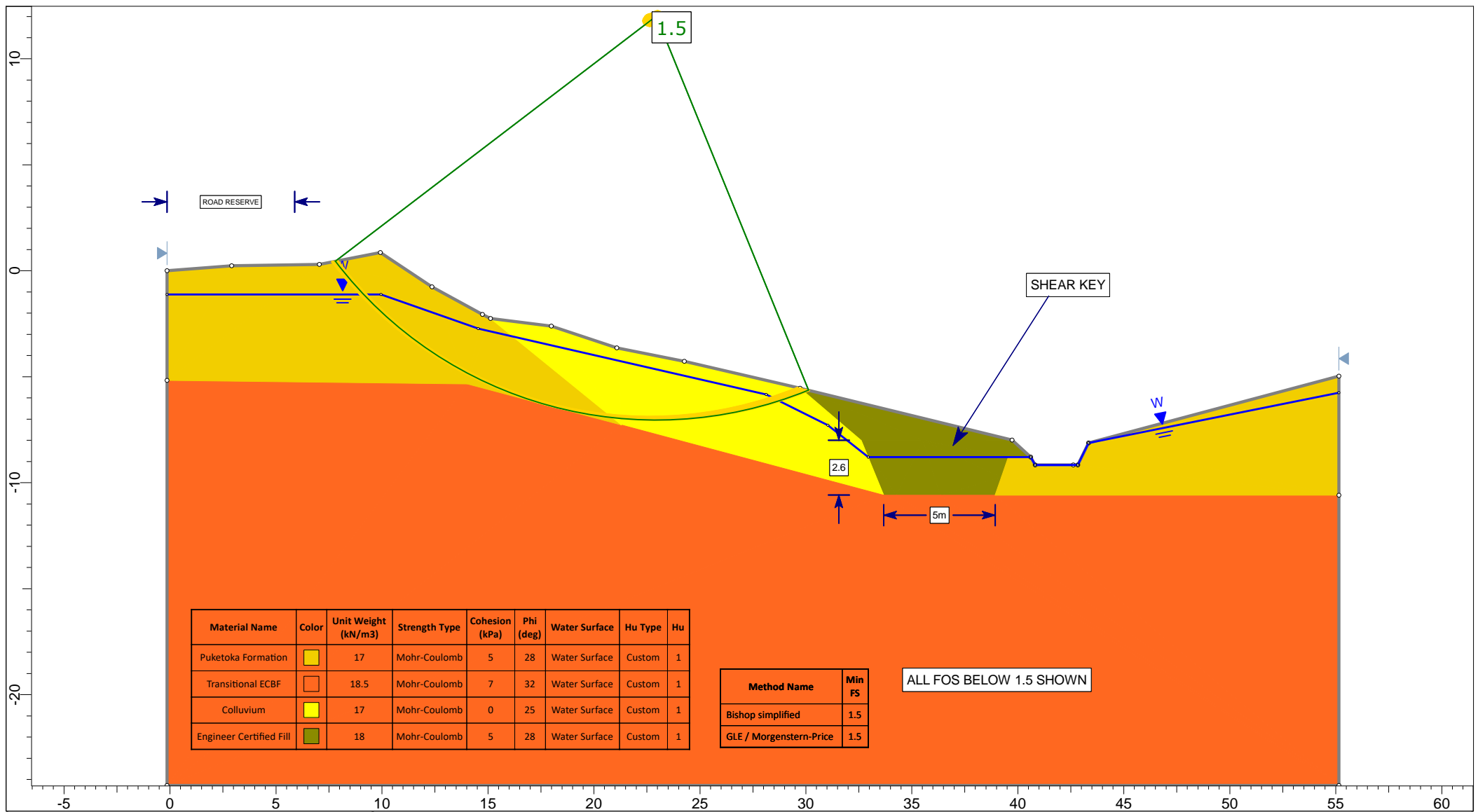


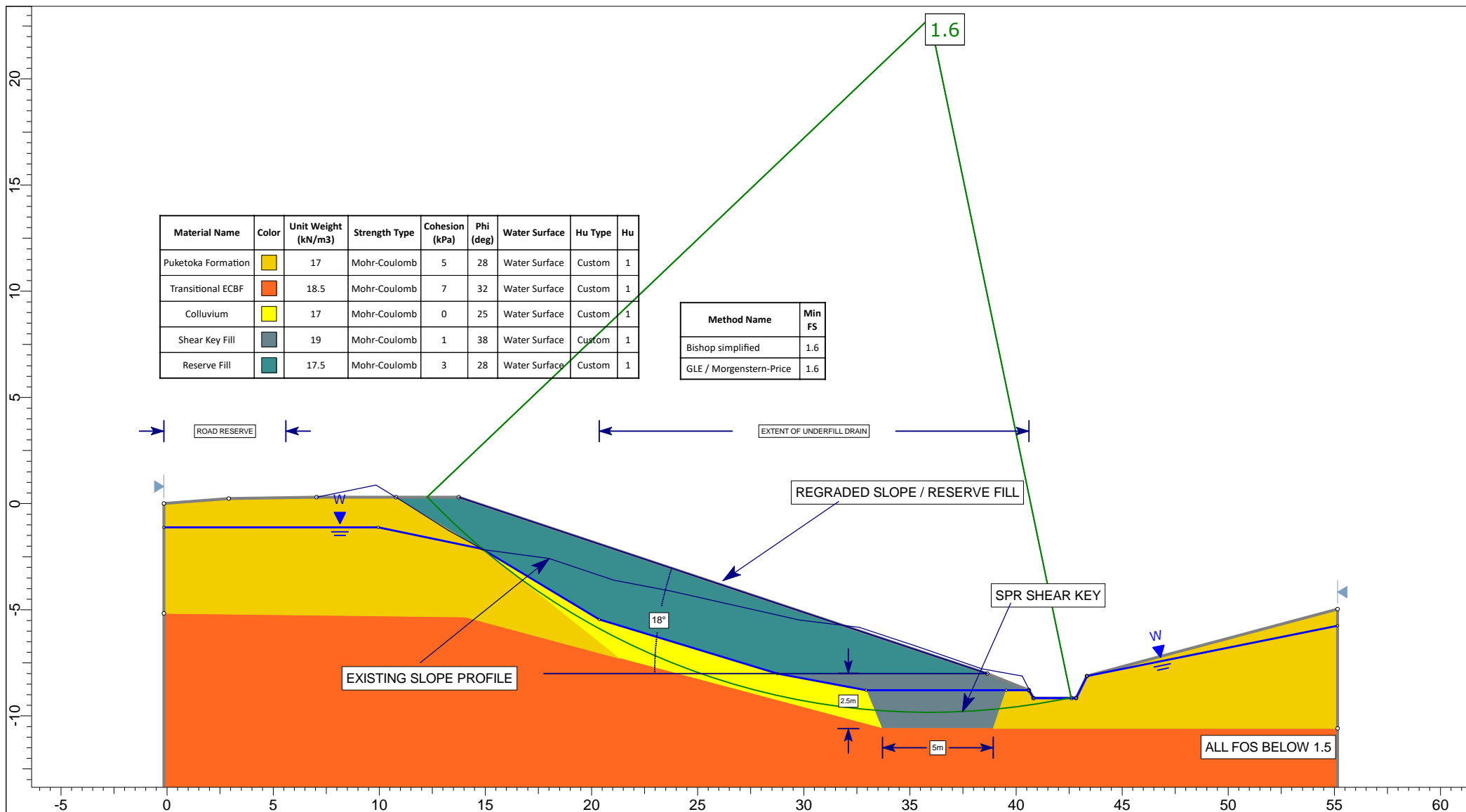












Project			DONEGAL STUD STAGE 10		
Analysis Description			CROSS SECTION DD SHEAR KEY & RESERVE FILL UNDERFILL DRAIN		
Drawn By	JL	Scale	1:250	Company	HUGH GREEN LIMITED
Date	30/01/2018	File Name	Section DD With Key & Res Fill RB.slmd		