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Our Ref: PSM3276-100L

9 April 2017

Frasers Property
Building C / 1 Homebush Bay Drive
RHODES NSW 2138

ATTENTION: PAUL SOLOMON
By email: Paul.Solomon@frasersproperty.com.au

Dear Paul

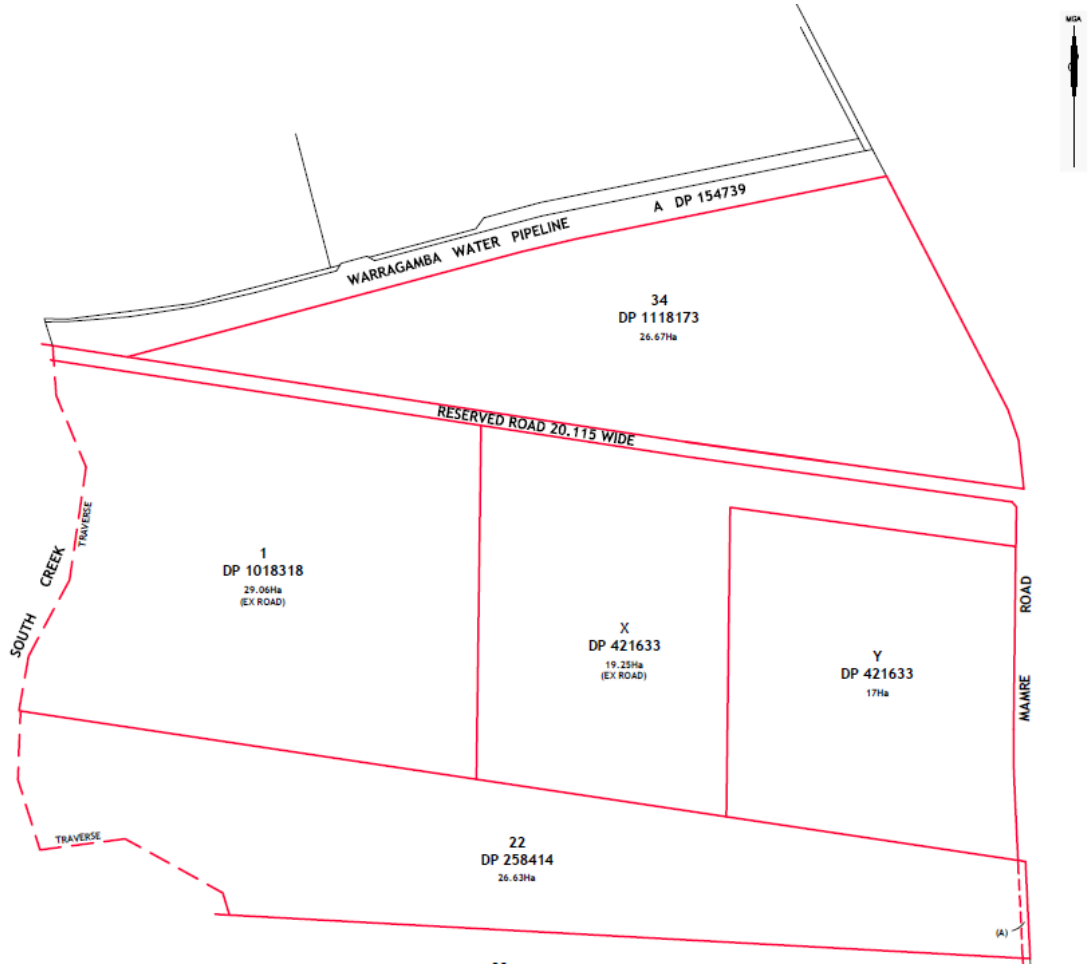
RE: 713-755 MAMRE ROAD, KEMPS CREEK
RESULTS OF GEOTECHNICAL INVESTIGATIONS

1 INTRODUCTION

This letter presents the results of geotechnical investigations undertaken by Pells Sullivan Meynink (PSM) at 713-755 Mamre Road, Kemps Creek. At the request of Frasers Property the report has been issued as part of a rezoning application for the following lots:

- DP 1118173 (26.6 ha)
- DP1018318 (29 ha)
- DP 258414 (26.6 ha)
- X DP421633 (19.25 ha)
- Y DP421633 (17 ha)

Insert 1 presents the locality plan.



Insert 1: Lot plan

The geotechnical investigation presented in this report was undertaken in Lot Y DP421633, i.e. at 713-755 Mamre Road, Kemps Creek. Based on our experience, we expect similar ground conditions in the other lots described above. Separate investigations for these lots will be required prior to development.

2 BACKGROUND

Prior to undertaking the work PSM were supplied with the following document:

- Aerial photograph of the site

PSM note the following about the site:

- The majority of the site currently consists of grassed and vegetated areas.
- The proposed development is for warehouse and logistics estate developments.

3 FIELDWORK - 713-755 MAMRE ROAD, KEMPS CREEK

The fieldwork was undertaken on 23 March 2017 under the fulltime supervision of a PSM geotechnical engineer, who undertook the following tasks:

- Setting out test locations
- Preparing engineering logs

The test locations were recorded with a hand-held GPS unit with a horizontal accuracy of approximately ±5 m. The elevations of the boreholes have been estimated from Monteath & Powys Survey (ref. Drawing no. 17/0115 Rev 01, dated 20.03.2017) provided to PSM. Figure 1 presents the test locations.

3.1 Test Pits

A total of twelve (12) test pits (TP01 to TP12) were excavated using an 8 tonne excavator. Attachment A presents a tabulated test pit logs and Attachment B presents photographs for these test pits.

The test pits were excavated to depths between 3.0 m and 4.1 m.

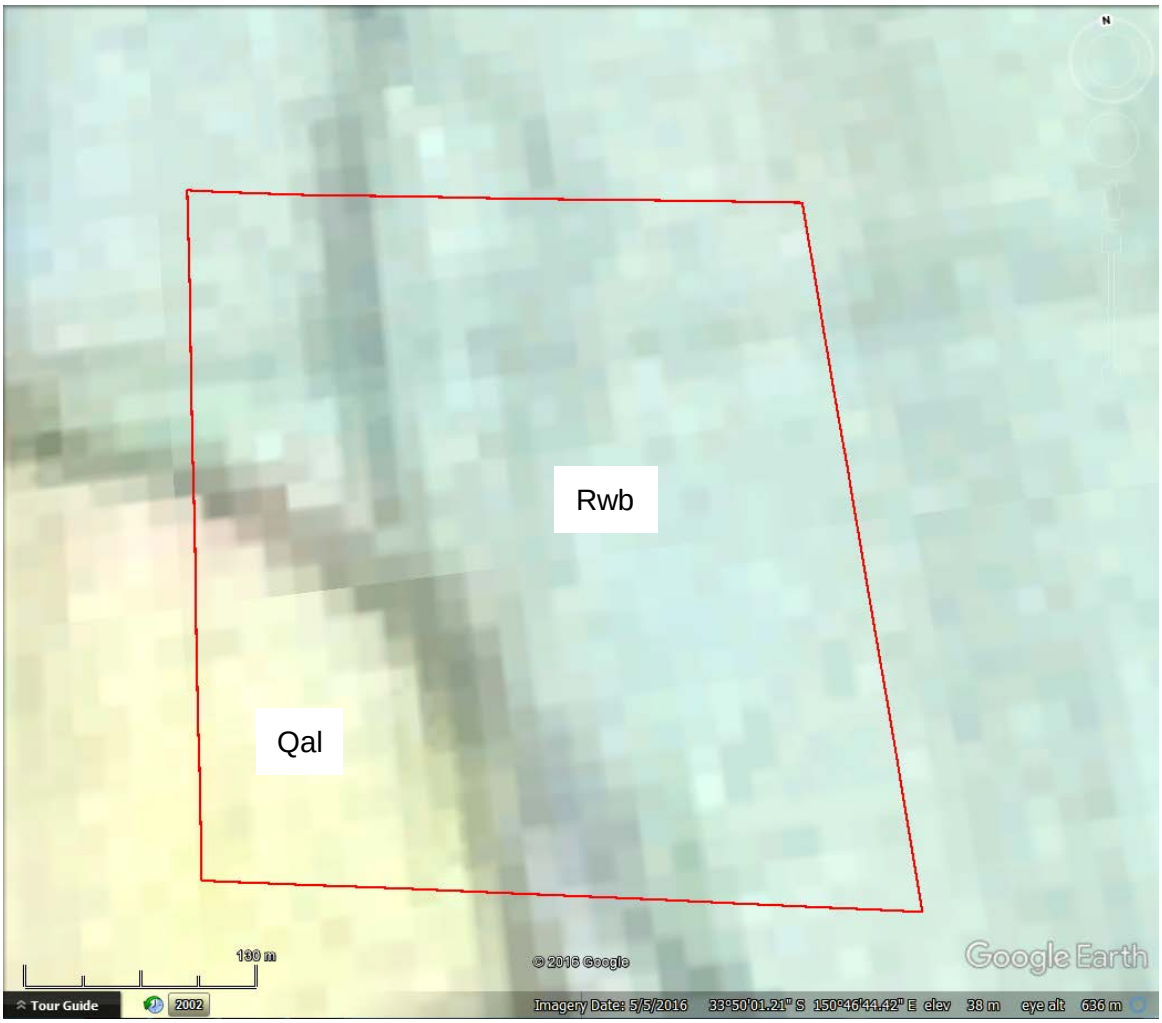
At the completion of the fieldwork, the test pits were backfilled with excavated spoil and lightly tamped with the excavator bucket. Figure 2 and Figure 3 present selected photos of the fieldwork.

4 SITE CONDITIONS - 713-755 MAMRE ROAD, KEMPS CREEK

4.1 Geological Setting

The 1:100,000 Penrith Geological map (1991) indicates:

- The south western corner of the site is underlain by alluvium (Qal) comprising fine-grained sand, silt and clay, eg. associated with South Creek.
- The remainder of the site is underlain by Bringelly Shale, a unit within the Wianamatta Group formation (Rwb), comprising shale, carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone, rare coal and tuff.



Insert 2: Geological map

4.2 Surface Conditions

At the time of fieldwork, the majority of the site consisted of grassed and moderately vegetated areas. The ground surface was very wet and soft in some areas on the western half of the site due to persistent rain prior to the fieldwork. A number of small farm dams were observed at various locations within the site.

The site is bound by Mamre Road on the East, an existing property consisting small buildings on the north and existing farm paddocks on the south and west.

Insert 3: Nearmap Aerial Image Showing Surface Conditions

4.3 Subsurface Conditions

The subsurface conditions encountered within the test pits are summarised in Table 1. Test pits were not targeted at the small farm dams on the site.

TABLE 1
SUMMARY OF INFERRED SUBSURFACE CONDITIONS ENCOUNTERED IN TEST PITS WITHIN THE PROPOSED NEW FACILITY AREA

INFERRED UNIT	INFERRED TOP OF UNIT DEPTH BELOW GROUND SURFACE (m)	DESCRIPTION
TOPSOIL	0.0	TOPSOIL; CLAY with some sand and trace of gravel, medium to high plasticity, brown, fine grained sand, sub-angular gravel up to 5 mm, soft to firm consistency, moist to wet, rootlets and organics observed down to 0.2 m.
NATURAL SOIL	0.1 to 0.2	CLAY; high plasticity, reddish brown, firm to stiff consistency, moist. Clayey SAND to Sandy CLAY; low to medium plasticity, mottled orange and pale grey, stiff to very stiff consistency, moist. Gravelly Sandy CLAY; medium to high plasticity, orange and grey, fine to medium grained sand, sub-rounded to sub-angular ironstone gravel up to 30 mm, very stiff consistency, moist.
BEDROCK	1.1 to 3.8	SHALE; pale grey to dark grey, extremely to highly weathered, extremely low to low strength.

Table 2 shows the approximate elevation to the top of the inferred geotechnical units encountered in the test pits.

TABLE 2
ELEVATION TO THE TOP OF INFERRED GEOTECHNICAL UNITS ENCOUNTERED IN TEST PITS

TP	ELEVATION TO TOP OF INFERRED GEOTECHNICAL UNITS (m)			
	TOPSOIL	NATURAL SOIL	BEDROCK	EOH
TP01	36.3	36.2	32.6	32.3
TP02	36.5	36.3	N.E	32.5
TP03	38.3	38.1	35.5	34.7
TP04	41.8	41.6	40.7	38.8
TP05	36.3	36.1	N.E	32.3
TP06	36.0	35.8	N.E	32.2
TP07	36.5	36.3	33.9	33.3
TP08	40.4	40.2	36.6	36.3
TP09	37.6	37.4	N.E	33.6
TP10	35.8	35.6	N.E	31.8
TP11	35.8	35.6	N.E	31.8
TP12	41.3	41.1	40.2	37.5

Note: EOH = End of Hole
N.E. = Not Encountered

4.4 Groundwater

Groundwater was not observed during our investigation. We note that there are some small farm dams on the site and these pond water.

5 DISCUSSION

5.1 Bulk Earthworks Specification and Interim Geotechnical Design Advice

We have prepared separate documents for the following:

- An Interim Geotechnical Design Advice (IGDA) for the proposed warehouse and logistics estate developments – Refer PSM3276-101L, see Attachment C.
- Bulk Earthworks Specification – Refer PSM3276-102S Rev 0, see Attachment D.

Should there be any queries, do not hesitate to contact the undersigned.

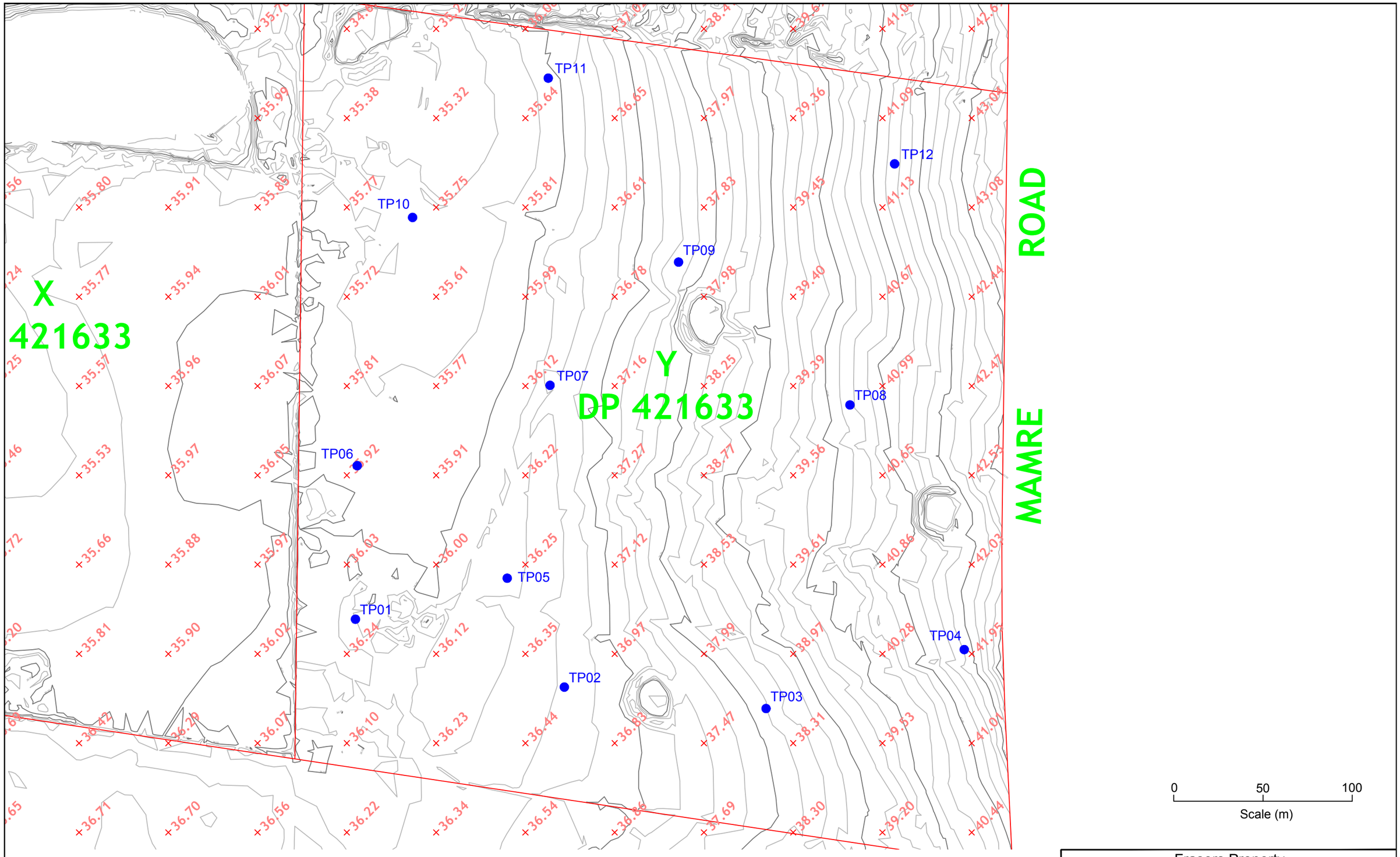
For and on behalf of
PELLS SULLIVAN MEYNINK

AGUSTRIA SALIM
Associate

GARRY MOSTYN
Principal

Encl.

Figure 1	Test Locations
Figure 2	Selected Photos (1 of 2)
Figure 3	Selected Photos (2 of 2)
Attachment A	Tabulated Test Pit Logs
Attachment B	Test Pit Photographs
Attachment C	PSM3276-101L – 713-755 Mamre Road, Kemps Creek – Interim Geotechnical Design Advice
Attachment D	PSM3276-102S – Bulk Earthworks Specification



LEGEND

TP01 PSM Test Pit (23 March 2017)

Pells Sullivan Meynink

Frasers Property
713-755 Mamre Road
Kemps Creek, NSW

GEOTECHNICAL INVESTIGATIONS
TEST LOCATIONS

PSM3276-100L	Figure 1

Photo 1 - 8 Ton Excavator

Photo 2 - Typical TOPSOIL and CLAY material encountered (top 0.8 m of TP04 shown)

Frasers Property
713-755 Mamre Road
Kemps Creek, NSW
GEOTECHNICAL INVESTIGATION
SELECTED SITE PHOTOS (1 OF 2)

PSM3276-100L	**FIGURE 2**

Pells Sullivan Meynink

Photo 3 - General Site Conditions

Photo 4 - Typical Sandy CLAY material encountered

Frasers Property
713-755 Mamre Road
Kemps Creek, NSW
GEOTECHNICAL INVESTIGATION
SELECTED SITE PHOTOS (2 OF 2)

PSM3276-100L	**FIGURE 3**

Pells Sullivan Meynink

ATTACHMENT A

TABULATED BOREHOLE LOGS

TABLE 1
SUMMARY OF SUBSURFACE CONDITIONS

TEST PIT	DEPTH	MATERIAL ENCOUNTERED
TP01	0 – 0.1 m	TOPSOIL; CLAY with some Sand and a trace of Gravel, medium to high plasticity, brown, fine grained sand, sub-angular gravel up to 5 mm, soft consistency, wet, rootlets and organics observed down to 0.1 m.
	0.1 – 1.9 m	CLAY; high plasticity, pale brown, firm to stiff consistency, moist.
	0.5 m	Becoming reddish brown and pale grey, very stiff consistency, moist.
	2.4 m	Traces of organics and buried tree branch observed at 2.4 m.
	1.9 – 3.7 m	Sandy CLAY with a trace of Gravel; medium plasticity, mottled pale grey and orange, fine grained sand, sub-angular ironstone gravel up to 35 mm, very stiff consistency, moist.
	3.7– 4.0 m	SHALE; pale grey and orange, extremely weathered, extremely low strength.
	4.0 m	Hole terminated at 4.0 m.
TP02	0 – 0.2 m	TOPSOIL; CLAY with some Sand and a trace of Gravel, medium to high plasticity, brown, fine grained sand, sub-angular gravel up to 5 mm, firm consistency, moist, rootlets and organics observed down to 0.2 m.
	0.2 – 1.2 m	CLAY; high plasticity, reddish brown, stiff consistency, moist.
	1.0 m	Becoming very stiff.
	1.2 – 2.0 m	Sandy CLAY; medium plasticity, mottled orange and pale grey, stiff consistency, moist.
	2.0 – 3.1 m	CLAY; medium to high plasticity, pale grey and orange, very stiff consistency, moist.
	3.1 – 3.8 m	Clayey SAND with some Gravel; fine grained, mottled orange and pale grey, low plasticity clay, sub-rounded gravel up to 20 mm, medium dense to dense consistency, moist.
	3.8 – 4.0 m	CLAY; medium to high plasticity, pale grey, brown and black, very stiff consistency, moist.
	4.0 m	Hole terminated at 4.0 m.

TEST PIT	DEPTH	MATERIAL ENCOUNTERED
TP03	0 – 0.2 m	TOPSOIL; CLAY with some Sand and a trace of Gravel, medium to high plasticity, brown, fine grained sand, sub-angular gravel up to 3 mm, soft consistency, wet, rootlets and organics observed down to 0.2 m.
	0.2 – 2.8 m	CLAY; high plasticity, reddish brown, firm to stiff consistency, moist.
	0.8 m	Becoming very stiff.
	2.2 m	Becomes pale grey and pale brown with a trace of organics.
	2.8 – 3.6 m	SHALE; pale grey, extremely weathered, extremely low strength.
	3.6 m	Hole terminated at 3.6 m.
TP04	0 – 0.2 m	TOPSOIL; CLAY with some Sand and a trace of Gravel, medium to high plasticity, brown, fine grained sand, sub-angular gravel up to 5 mm, firm consistency, moist, rootlets and organics observed down to 0.2 m.
	0.2 – 1.1 m	CLAY; high plasticity, reddish brown, very stiff consistency, moist.
	0.8 m	Becoming pale grey and brown.
	1.1 – 3.0 m	SHALE; pale grey, extremely weathered, very low to low strength.
	2.1 m	Becoming dark grey, highly weathered, low strength.
	3.0 m	Hole terminated at 3.0 m.
TP05	0 – 0.2 m	TOPSOIL; CLAY with a trace of Sand and Gravel, medium plasticity, brown, fine grained sand, sub-angular gravel up to 3 mm, stiff consistency, moist, rootlets and organics observed down to 0.2 m.
	0.2 – 2.9 m	CLAY; high plasticity, reddish brown, very stiff consistency, moist.
	0.7 m	Becoming mottled reddish brown and grey.
	2.9 – 3.4 m	Sandy Gravelly CLAY; medium plasticity, orange, grey and black, fine to medium grained sand, sub-rounded to sub-angular gravel up to 30 mm, very stiff consistency, moist.
	3.4 – 4.0 m	Clayey SAND with a trace of Gravel; fine grained, orange and grey, low plasticity clay, sub-rounded to sub-angular gravel up to 60 mm, medium dense to dense consistency, moist.
	4.0 m	Hole terminated at 4.0 m.

TEST PIT	DEPTH	MATERIAL ENCOUNTERED
TP06	0 – 0.2 m	TOPSOIL; CLAY with some Sand and a trace of Gravel, medium to high plasticity, brown, fine grained sand, sub-angular gravel up to 5 mm, soft consistency, wet, rootlets and organics observed down to 0.2 m.
	0.2 – 2.6 m	CLAY; high plasticity, orange and brown, very stiff consistency, moist.
	0.6 m	Buried branches observed at 0.6 m.
	1.3 m	Becoming pale grey and orange.
	2.6 – 3.8 m	Sandy CLAY with some Gravel; low to medium plasticity, orange and grey, fine grained sand, highly weathered sub-angular ironstone gravel up to 60 mm, very stiff consistency, moist.
	3.8 m	Hole terminated at 3.8 m.
TP07	0 – 0.2 m	TOPSOIL; CLAY with some Sand and Gravel; medium to high plasticity, brown, fine grained sand, sub-rounded gravel up to 3 mm, soft to firm consistency, moist, rootlets and organics observed down to 0.2 m.
	0.2 – 1.9 m	CLAY; high plasticity, reddish brown, very stiff consistency, moist.
	1.9 – 2.2 m	Gravelly Sandy CLAY; medium to high plasticity, dark grey and black, sub-rounded to sub-angular gravel up to 30 mm, fine to medium grained sand, hard consistency, moist.
	2.2 – 2.6 m	Sandy CLAY; medium plasticity, mottled orange and brown, fine grained sand, very stiff consistency, moist.
	2.6 – 3.2 m	SHALE; pale grey, extremely weathered, extremely low to very low strength.
	3.2 m	Hole terminated at 3.2 m.
TP08	0 – 0.2 m	TOPSOIL; CLAY with some Sand and a trace of Gravel, medium to high plasticity, brown, fine grained sand, sub-angular gravel up to 3 mm, firm consistency, moist, rootlets and organics observed down to 0.2 m.
	0.2 – 0.5 m	CLAY; medium plasticity, reddish brown, stiff consistency, moist.
	0.5 – 2.9 m	CLAY; medium to high plasticity, reddish brown and grey, very stiff consistency, moist.
	1.9 m	Becoming pale grey, with a trace of purple organics.
	2.9 – 3.8 m	Gravelly CLAY with some Sand; medium to high plasticity, mottled orange, grey and black, sub-rounded to sub-angular gravel up to 30 mm, very stiff consistency, moist.
	3.8 – 4.1 m	SHALE; pale brown and pale grey, extremely weathered, extremely low strength.
	4.1 m	Hole terminated at 4.1 m.

TEST PIT	DEPTH	MATERIAL ENCOUNTERED
TP09	0 – 0.2 m	TOPSOIL; CLAY with some Sand and a trace of Gravel, medium to high plasticity, brown, fine grained sand, sub-angular gravel up to 5 mm, firm consistency, moist, rootlets and organics observed down to 0.2 m.
	0.2 – 2.6 m	CLAY; high plasticity, reddish orange, very stiff consistency, moist.
	1.2 m	Becoming mottled reddish brown and grey.
	1.4 m	Large branch observed at 1.4 m.
	2.6 – 3.3 m	Sandy CLAY; medium plasticity, mottled orange and grey, fine to medium grained sand, stiff to very stiff consistency, moist.
	3.3 – 4.0 m	Gravelly Sandy CLAY; medium to high plasticity, mottled grey, reddish brown and black, fine to medium grained sand, sub-angular gravel up to 30 mm, very stiff consistency, moist
	4.0 m	Hole terminated at 4.0 m.
TP10	0 – 0.2 m	TOPSOIL; CLAY with some Sand and a trace of Gravel, medium to high plasticity, brown, fine grained sand, sub-angular gravel up to 5 mm, soft consistency, wet, rootlets and organics observed down to 0.2 m.
	0.2 – 1.1 m	CLAY; high plasticity, reddish brown, very stiff consistency, moist.
	1.1 – 2.1 m	Sandy CLAY; low to medium plasticity, mottled orange and grey, fine grained sand, stiff consistency, moist.
	2.1 – 4.0 m	Clayey SAND with a trace of Gravel; fine grained sand, grey and brown, low plasticity clay, sub-rounded ironstone gravel up to 35 mm, dense consistency, moist.
	4.0 m	Hole terminated at 4.0 m.
TP11	0 – 0.2 m	TOPSOIL; CLAY with a trace of Sand and Gravel; medium plasticity, brown, sub-angular gravel up to 2 mm, firm consistency, moist, rootlets and organics observed down to 0.2 m.
	0.2 – 2.2 m	CLAY; high plasticity, mottled orange and grey, very stiff consistency, moist.
	2.2 – 3.0 m	Sandy CLAY; medium plasticity, orange and grey, fine grained sand, very stiff consistency, moist.
	3.0 – 3.8 m	Gravelly Sandy CLAY; medium to high plasticity, orange and grey, fine to medium grained sand, sub-rounded to sub-angular ironstone gravel up to 30 mm, very stiff consistency, moist
	3.8 – 4.0 m	Sandy CLAY; medium plasticity, orange and pale grey, fine grained sand, stiff to very consistency, moist.
	4.0 m	Hole terminated at 4.0 m.

TEST PIT	DEPTH	MATERIAL ENCOUNTERED
TP12	0 – 0.2 m	TOPSOIL; CLAY with a trace of Sand and Gravel, medium to high plasticity, brown, fine grained sand, sub-angular gravel up to 3 mm, soft consistency, wet, rootlets and organics observed down to 0.2 m.
	0.2 – 1.1 m	CLAY; high plasticity, reddish brown and grey, very stiff consistency, moist.
	0.9 m	Small buried branches observed at 0.9 m.
	1.1 – 3.8 m	SHALE; pale brown and grey, extremely weathered, extremely low strength
	2.3 m	Becoming pale grey.
	3.5 m	Becoming highly weathered, very low to low strength.
	3.8 m	Hole terminated at 3.8 m.

ATTACHMENT B

TEST PIT PHOTOGRAPHS

Test Pit TP01

Pells Sullivan Meynink

Frasers Property

717-755 Mamre Road

Kemps Creek, NSW

GEOTECHNICAL INVESTIGATION
TEST LOCATIONS

PSM3276-100L	**Attachment B**

Test Pit TP02

Frasers Property	
717-755 Mamre Road	
Kemps Creek, NSW	
GEOTECHNICAL INVESTIGATION TEST LOCATIONS	
PSM3276-100L	**Attachment B**

Pells Sullivan Meynink

Test Pit TP03

Pells Sullivan Meynink

Frasers Property

717-755 Mamre Road

Kemps Creek, NSW

GEOTECHNICAL INVESTIGATION
TEST LOCATIONS

PSM3276-100L	**Attachment B**

Test Pit TP04

Pells Sullivan Meynink

Frasers Property

717-755 Mamre Road

Kemps Creek, NSW

GEOTECHNICAL INVESTIGATION
TEST LOCATIONS

PSM3276-100L	**Attachment B**

Test Pit TP05

Frasers Property	
717-755 Mamre Road	
Kemps Creek, NSW	
GEOTECHNICAL INVESTIGATION TEST LOCATIONS	
PSM3276-100L	**Attachment B**

Pells Sullivan Meynink

Test Pit TP06

Frasers Property **717-755 Mamre Road** **Kemps Creek, NSW** **GEOTECHNICAL INVESTIGATION** **TEST LOCATIONS**	
PSM3276-100L	**Attachment B**

Pells Sullivan Meynink

Test Pit TP07

Frasers Property **717-755 Mamre Road** **Kemps Creek, NSW** **GEOTECHNICAL INVESTIGATION** **TEST LOCATIONS**	
PSM3276-100L	**Attachment B**

Pells Sullivan Meynink

Test Pit TP08

Pells Sullivan Meynink

Frasers Property

717-755 Mamre Road

Kemps Creek, NSW

GEOTECHNICAL INVESTIGATION
TEST LOCATIONS

PSM3276-100L	**Attachment B**

Test Pit TP09

Pells Sullivan Meynink

Frasers Property

717-755 Mamre Road

Kemps Creek, NSW

GEOTECHNICAL INVESTIGATION
TEST LOCATIONS

PSM3276-100L	**Attachment B**

Test Pit TP10

Frasers Property **717-755 Mamre Road** **Kemps Creek, NSW** **GEOTECHNICAL INVESTIGATION** **TEST LOCATIONS**	
PSM3276-100L	**Attachment B**

Pells Sullivan Meynink

Test Pit TP11

Frasers Property	
717-755 Mamre Road	
Kemps Creek, NSW	
GEOTECHNICAL INVESTIGATION TEST LOCATIONS	
PSM3276-100L	**Attachment B**

Pells Sullivan Meynink

Test Pit TP12

Pells Sullivan Meynink

Frasers Property

717-755 Mamre Road

Kemps Creek, NSW

GEOTECHNICAL INVESTIGATION
TEST LOCATIONS

PSM3276-100L	**Attachment B**

ATTACHMENT C

PSM3276-101L
713-755 MAMRE ROAD, KEMPS CREEK – INTERIM GEOTECHNICAL DESIGN ADVICE

Pells Sullivan Meynink
Engineering Consultants
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Our Ref: PSM3276-101L

9 April 2018

Frasers Property
Building C / 1 Homebush Bay Drive
RHODES NSW 2138

ATTENTION: PAUL SOLOMON
By email: Paul.Solomon@fraserspropery.com.au

Dear Paul

RE: 713-755 MAMRE ROAD, KEMPS CREEK
INTERIM GEOTECHNICAL DESIGN ADVICE

1 INTRODUCTION

This letter presents interim geotechnical design advice for 713-755 Mamre Rd, Kemps Creek. This interim advice will be confirmed and issued as final on completion of the bulk earthworks.

2 BULK EARTHWORKS

PSM understand that cut and fill works will be required for this site. At this stage, volumes and depths of cut and fill are not known to PSM.

The design intent is for the bulk earthworks on site to be completed in accordance with a PSM Specification – PSM3276-102S Rev 0. The Specification sets out clearly the roles and responsibilities of the earthworks contractor and its Geotechnical Inspection and Testing Authority (GITA). The Specification will only be varied with the consent of PSM to ensure that this interim design advice is able to be confirmed at the completion of the earthworks.

The Specification allows for a broad range of fill to be incorporated into the earthworks. The Specification requires close inspection, and frequent testing to provide a high level of confidence that the completed work complies with the Specification.

We have based our assessment of moduli on numerous plate load tests (PLTs) completed on VENM/ENM fills by PSM. Fill placed in accordance with such a specification is referred to herein as ENGINEERED FILL. It is our opinion that the cut material with the exception of the TOPSOIL unit would be suitable for reuse on the site as ENGINEERED FILL without the requirement for crushing. The criteria for and selection of acceptable material is set out in Clause 2.3 of The Specification.

If the structural or civil engineer requires engineering properties different to those provided in Section 3, then the Specification can be modified such that these properties will be obtained in the final earthworks. This allows the additional cost of the earthworks to be balanced against any economies achieved in other parts of the works.

3 GEOTECHNICAL DESIGN ADVICE FOR THE PROPOSED DEVELOPMENT

3.1 General

We note the details of the proposed development (eg. type, loads, earthworks) are not known to PSM. The design advice provided in the following sections has been prepared on the following basis:

- The proposed new facility will comprise typical light warehouse facilities, eg. not a high bay development.
- The subsurface conditions are as those encountered in the test pits reported in PSM3276-100L.
- The earthworks are to be completed in accordance with the PSM bulk earthworks specification PSM3276-102S.

If any of the above basis is not applicable, PSM should be requested to confirm that the design advice below is still valid.

3.2 Site Classification

While the proposed development is out of scope of AS2870-2011 *"Residential slabs and footings"*, we assess that the characteristic surface movement, y_s, would be in the range 40 mm to 60 mm and thus would classify the site as Class H1. The civil and structural engineers should consider likely heave / settlement due to the effect of climatic factors in their designs.

We recommend that all structures and services be detailed such that they preclude any local wetting up or drying out of the subgrade after initial equilibrium is reached following construction of the slab and that the subgrade be within specification at the time of construction of the slab. We note that normal mounding or sagging away from the perimeter of covered areas will still occur and perimeters, or open joints, will still respond to environmental changes.

For effectively sealed areas away from the perimeter, the design should allow for the following:

- Differential mound movement, y_m = 15 mm. We note that this is not the total heave or settlement but the estimated local heave or settlement due to fill variability.
- Tilts of up to approximately 1 in 300.

Mounds at perimeters or penetrations of slabs open to the environment can be taken to be as per AS2870-2011 for y_s = 45 mm.

3.3 Permanent and temporary batters

The batter slope angles shown in Table 1 are recommended for the design of batters up to 3 m height and above the groundwater table; subject to the following recommendations:

1. The batters shall be protected from erosion.
2. Permanent batters shall be drained.
3. Temporary batters shall not be left unsupported for more than 1 month without further advice, and inspection by a geotechnical engineer should be undertaken following significant rain events.
4. Where loads are imposed or structures/services are located within one batter height of the crest of the batter, further advice should be sought.

TABLE 1
BATTER SLOPE ANGLES

UNIT	TEMPORARY	PERMANENT
SOIL UNITS, eg. ENGINEERED FILL, NATURAL SOIL	2.0H : 1V	2.5H : 1V
BEDROCK	1.0H : 1V	1.5H : 1V

Steeper batters may be possible subject to further advice, probably including inspection during construction.

3.4 Excavation support

Permanent cuts in the ENGINEERED FILL, NATURAL SOIL and BEDROCK units steeper than the recommended permanent batter slopes in Table 1 will need to be supported by some form of retaining structure.

Note that design of retention systems may be based on either K_a or K_o earth pressures. Design using active earth pressures provides the minimum lateral earth pressure that must be supported to avoid failure and requires a wall that can rotate or translate to allow the pressures to reduce to these values (vertical and lateral movements up to 2% of height may occur, typical movements will be much less).

Where the design is based on K_o pressures, construction should be carefully controlled to avoid unwanted effects. It should be noted that designing for K_o pressures does not, of itself, ensure that movement does not occur. Movements are controlled by the construction method, especially sequence.

The designer shall adopt the effective strength parameters in Table 2 when assessing the earth pressure on the retaining structures.

Both surface and sub-surface drainage needs to be designed and constructed properly to prevent pore water pressures from building up behind the retaining walls or appropriate water pressures must be included in the design.

3.5 Foundation

3.5.1 Shallow footings

Pad footings can be proportioned on the basis of an allowable bearing pressure (ABP) for centric vertical loads provided in Table 2. Higher ABPs in soil units may be available, but these depend on the size, depth, loads, etc and would be subject to specific advice.

Settlements in soil units can be estimated using the elastic parameters provided in Table 2.

TABLE 2
ENGINEERING PARAMETERS OF INFERRED GEOTECHNICAL UNITS

INFERRED UNIT	BULK UNIT WEIGHT (kN/m^3)	SOIL EFFECTIVE STRENGTH PARAMETERS		ULTIMATE BEARING PRESSURE UNDER VERTICAL CENTRIC LOADING (kPa)	ALLOWABLE BEARING PRESSURE (ABP) UNDER VERTICAL CENTRIC LOADING (kPa)	ELASTIC PARAMETERS	
		c' (kPa)	ϕ' (deg)			LONG TERM YOUNG MODULUS (MPa)	POISSON'S RATIO
SOIL UNITS, eg. ENGINEERED FILL, NATURAL SOIL	18	0	30	420[1]	150[1]	10	0.3
BEDROCK	22	NA	NA	3,000	700	100	0.3

Note: 1. Pad footings (for ABP of 150 kPa) should have a minimum horizontal dimension of 1.0 m and a minimum embedment depth of 0.5 m.
2. Ultimate values occur at large settlement (>5% of minimum footing dimensions).
3. End bearing pressure to cause settlement of <1% of minimum footing dimensions.

3.6 Slab on ground

The design of slabs on ground on the ENGINEERED FILL and NATURAL SOIL units can be based on a subgrade with a long term Young's Modulus of 10 MPa. The short term Young's modulus can be taken to be 15 MPa.

We note that the environmental effects (eg. drying or wetting up of the finished surface) affecting the land prior to development should be taken into account by the various designers of any development.

We note that the final bulk earthworks subgrade will require proof rolling and plate load testing to confirm the properties provided and may require some boxing out and refilling, etc.

We understand that the structural engineer should be able to design efficient slabs. If assessed deformation and settlement is an issue, our advice can be further refined if required.

The structural designer or builder may wish to employ a surface layer of road base / crushed sandstone / concrete for trafficability or structural purposes. This is not required to achieve the properties provided in this design advice.

3.7 Pavements

A CBR of 2% can be adopted for subgrade and fill formed in bulk earthworks constructed in accordance with the Specification. Higher values, particularly in areas of significant cut, may be provided on completion of testing on the finished bulk earthworks or if, on request, the Specification is varied to obtain such higher value on fill.

We recommend that specific CBR testing be undertaken at subgrade level when pavement layouts are finalised.

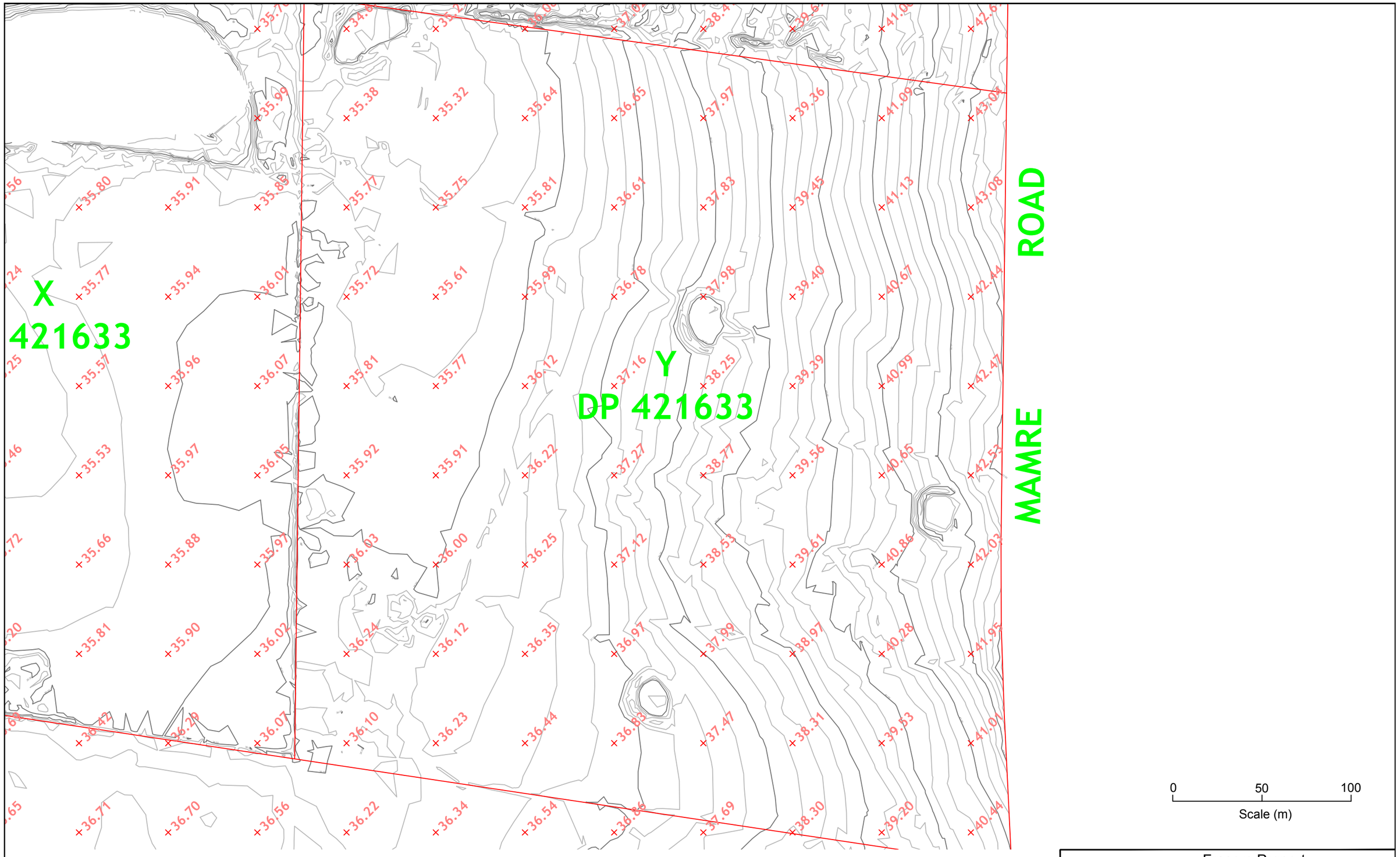
Should there be any queries, do not hesitate to contact the undersigned.

For and on behalf of
PELLS SULLIVAN MEYNINK

AGUSTRIA SALIM
Associate

GARRY MOSTYN
Principal

Encl. Figure 1 Locality Plan



Pells Sullivan Meynink

Frasers Property
713-755 Mame Road
Kemps Creek, NSW

LOCALITY PLAN

PSM3276-101L	Figure 1

ATTACHMENT D

PSM3276-102S REV0
BULK EARTHWORKS SPECIFICATION

Mamre Rd, Kemps Creek

BULK EARTHWORK SPECIFICATION
FILLING, CUTTING AND TESTING

PSM3276-102S REV 0 **APRIL 2018**

CONTENTS

ATTACHMENTS

1 SCOPE

This specification details the requirements for the bulk earthworks to be undertaken at the proposed industrial development at 713-755 Mamre Rd in Kemps Creek, NSW. The area where this specification is applicable is shown in Figure 1. This includes areas where material is filled or cut to bulk earthworks level (BEL) within the site.

Fill placed in accordance with this specification is denoted as Engineered Fill.

This specification does not address any environmental, contamination or erosion issues with respect to the fill material.

There is a **HOLD POINT** on placing fill in Clause 2.4 of this Specification.

2 FILLING WORKS

2.1 Subgrade Preparation

The condition of the subgrade should be assessed immediately prior to filling commencing.

All Engineered Fill is to be placed on one of the following four (4) materials:

1. Bedrock.
2. Natural insitu material of at least stiff consistency.
3. Engineered compacted fill placed in accordance with this or other approved specifications for which the Geotechnical Inspection and Testing Authority (GITA) has a Level 1 certificate certifying compliance with that approved specification.
4. Other materials as approved by PSM.

Proof rolling shall only be undertaken under the direction of PSM. PSM may also direct a bridging layer of Engineered Fill be placed and compacted to a Dry or Hilf Density Ratio (Standard Compaction) of between 95% and 102%. Any such layer shall be a Lot under Clause 5.3.

The GITA should satisfy itself that the subgrade has not been desiccated, affected by rain or disturbed. If the GITA cannot so satisfy itself, then the subgrade should be moisture conditioned and compacted to be in accordance with Clauses 2.5 and 2.6 of this specification.

Engineered Fill shall be placed only on subgrade approved by the GITA as being in accordance with this specification.

2.2 Base Geometry

The slope of any buried batter shall be less than 1H:1V unless otherwise directed by PSM.

The contractor shall remove or flatten any geometrical obstructions (e.g. protrusions or holes) such that subsequent Engineered Fill can be placed to achieve the requirements of this specification.

Engineered Fill shall be placed only on areas where the base geometry has been approved by the GITA.

2.3 Material

2.3.1 Site Won Natural Material

Site won natural material is to conform to the definition of "Virgin excavated natural material" (**VENM**) as defined by the Protection of the Environment Operations Act 1997 No 156, Schedule 1, on Page 209:

> *"Virgin excavated natural material (eg clay, gravel, sand, soil and rock) that is not mixed with any other waste and that:*
>
> *a) has been excavated from areas that are not contaminated, as a result of industrial, commercial, mining or agricultural activities, with manufactured chemicals and that does not contain sulphide ores or soils, or*
>
> *b) consists of excavated natural materials that meet such criteria as may be approved by the EPA".*

2.3.2 Imported Fill

Imported Engineered Fill is to conform to the definition of VENM as defined in Clause 2.3.1 of this Specification or the following:

1. "Excavated natural material" (**ENM**) as defined by the Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A, the excavated natural material exemption 2012:

   "Excavated natural material is naturally occurring rock and soil (including but not limited to materials such as sandstone, shale, clay and soil) that has:

   a) been excavated from the ground, and

   b) contains at least 98% (by weight) natural material, and

   c) does not meet the definition of Virgin Excavated Natural Material in the Act.

   d) Excavated Natural Material does not include material that has been located in a hotspot; that has been processed; or that contains asbestos, Acid Sulphate Soils (ASS), Potential Acid Sulphate soils (PASS) or sulfidic ores."

2.3.3 All Fill

Engineered Fill shall be approved by the GITA as suitable for use in a structural fill.

Engineered Fill shall not comprise unsuitable material as defined by Clause 4.2 of AS3798-2007 “Guidelines on earthworks for commercial and residential developments" as:

e) *“organic soils, such as many topsoils, severely root-affected subsoils and peat;*

f) *materials contaminated through past site usage which may contain toxic substances or soluble compounds harmful to water supply or agriculture;*

g) *materials containing substances which can be dissolved or leached out in the presence of moisture (eg: gypsum), or which undergo volume change or loss of strength when disturbed and exposed to moisture (eg: some shales and sandstones), unless these matters are specifically addressed in the design;*

h) *silts, or materials that have the deleterious engineering properties of silt;*

i) *other materials with properties that are unsuitable for the forming of structural fill; and*

j) *fill that contains wood, metal, plastic, boulders or other deleterious material, in sufficient proportions to affect the required performance of the fill."*

The GITA shall assess that the proportion of deleterious material in each Lot is not greater than 0.25% by weight. Deleterious material is defined by Table 3015.3 of the RTA QA Specification 3051 (Edition 5 June 1998) as:

“Type III: Rubber, Plastic, Bitumen, Paper, Cloth, Paint, Wood and Other Vegetable Matter”

If the GITA is not able to visually assess the above criterion, the GITA shall arrange appropriate testing.

All Engineered Fill particles shall be able to be incorporated within a single layer. Further, less than 30% of particles shall be retained on the 37.5 mm sieve.

Engineered Fill shall be able to be tested in accordance with the Standard Compaction method (AS1289.5.4.1) or Hilf test method (AS1289.5.7.1). These methods require less than 20% retained on the 37.5 mm sieve. Where between 20% and 30% of particles are retained on the 37.5 mm sieve the above test methods shall still be adopted and test reports annotated appropriately.

These requirements should be met by the material after placement and compaction.

Only material approved by the GITA shall be placed as Engineered Fill.

2.4 Fill Zonation and Placement

HOLD POINT

PROCESS HELD	PLACING OF FILL
Submission detail	The Contractor / GITA submit to PSM a Weekly Certificate as defined in Clause 6.2.1 of this specification for the earthworks completed to the previous Saturday no later than 5 pm of the subsequent Wednesday.
Release of Hold Point	PSM to confirm receipt of Weekly Certificate and release Hold Point if initial assessment of the Weekly Certificate indicates it complies with requirements of this specification.

Engineered Fill shall be placed in accordance with the following requirements:

1. In near horizontal, laterally extensive layers of uniform material and thickness, deposited systematically across the work area as determined by the GITA.
2. The compacted thickness of each layer shall be equal to or less than 300 mm.

Engineered Fill shall only be placed on subgrade in accordance with this specification and approved by the GITA.

2.5 Compaction

Engineered Fill shall be placed and compacted to a Dry or Hilf Density Ratios (Standard Compaction) of between 98% and 102%.

The insitu density shall be measured over the full depth of each layer placed.

2.6 Moisture Control

The placement moisture variation or Hilf moisture variation shall be controlled to be between 2% dry of optimum and 2% wet of optimum.

Placement moisture content of the Engineered Fill shall be measured.

3 CUTTING

3.1 Subgrade Condition

The subgrade is to comprise one of the following three (3) materials:

1. Bedrock.
2. Natural insitu material of at least stiff consistency.
3. Other materials as approved by PSM.

Proof rolling shall only be undertaken under the direction of PSM.

The GITA should satisfy itself that the subgrade has not been desiccated, affected by rain or disturbed. If the GITA cannot so satisfy itself, then the subgrade should be excavated and filled to the BEL in accordance with this specification.

4 SURVEY

4.1 Filling Areas

The survey requirements are as follows:

1. Any approved subgrade shall be surveyed prior to first filling such that subgrade levels are established to within ± 0.1 m. The area subject to approval shall be assessed and shown on a plan drawing to an accuracy of at least +/- 5 m in plan.
2. The Lot boundaries shall be surveyed and shown on a plan drawing to an accuracy of at least +/- 5 m in plan.
3. The location of the field density tests shall be surveyed and shown on the Lot boundary plan drawing to an accuracy of at least +/-5 m in plan.
4. The elevation of the field density tests shall be surveyed to an accuracy of +/-0.05 m.

The plan drawing shall show at the boundaries of the site and other identifiable site features, so as to allow the location of the lots and the test to be recoverable.

4.2 Cutting Areas

Any approved subgrade for cut areas shall be surveyed such that subgrade levels are established to within ± 0.1 m.

5 INSPECTION AND TESTING

5.1 Role of the GITA

The Geotechnical Inspection and Testing Authority (GITA) shall be contracted to document and certify that the works undertaken by the contractor has been completed in accordance with the relevant design and specifications.

5.2 Level 1 Control

The GITA shall adopt Level 1 responsibility as described in Section 8.2 of AS 3798-2007 "Guidelines on earthworks for commercial and residential developments":

> *"The primary objective of Level 1 Inspection and Testing is for the geotechnical inspection and testing authority (GITA) to be able to express an opinion on the compliance of the work. The GITA is responsible for ensuring that the inspection and testing are sufficient for this purpose.*
>
> *The geotechnical inspection and testing authority needs to have competent personnel on site at all times while earthwork operations are undertaken. Such operations include:*
>
> - *Completion of removal of top soil*
> - *Placing of imported or cut material*
> - *Compaction and adding/removal of moisture*
> - *Trenching and backfilling*
> - *Test rolling*
> - *Testing*
>
> *The superintendent should agree a suitable inspection and testing plan prior to commencement of the works.*
>
> *On completion of the earthworks, the GITA will usually be required to provide a report setting out the inspections, sampling and testing it has carried out, and the locations and results thereof. Unless very unusual conditions apply, the GITA should also be able to express an opinion that the works (as far as it has been able to determine) comply with the requirements of the specification and drawings."*

For this particular contract, Level 1 responsibility includes:

1. Lot testing as per Clause 5.3 of this specification.
2. A frequency of compaction testing not less than that specified in Clause 5.4 of this specification.
3. The GITA documenting and reporting its activity in the terms required by Clause 6 of this specification.
4. The GITA undertaking adequate inspections and testing to comply with the above requirements and to be able to certify the fill in the terms required by Clause 6 of this specification.

5.3 Lot Testing

This specification requires lot testing to be undertaken.

A Lot is defined as a single layer of Engineered Fill consisting of uniform material which has undergone similar treatment.

Lot testing comprises the following:

1. A Lot shall be identified by the Contractor or the GITA with a Lot Number and presented for testing.
2. A Lot shall be deemed to be in accordance with the specification if all the tests undertaken within the Lot are in accordance with the specification, i.e. "a none to fail basis".
3. If any one test undertaken within a Lot fails, the whole of the Lot shall be reworked and retested.

Any portion of the placed Engineered Fill must be part of a single lot and all Lots will require approval by the GITA.

5.4 Testing Frequency (Compaction Testing)

The frequency of compaction testing for each lot shall not be less than the greater of:

1. For lot less than 50 m^3.
   (a) 1 test per lot
2. For lot between 50 m^3 and 100 m^3.
   (a) 2 tests per lot
3. For lot greater than 100 m^3.
   (a) 1 test per 300 m^3 of material placed as Blended Topsoil as defined in Clause 2.3.2 of this specification.
   (b) 1 test per 500 m^3 of material placed.
   (c) 3 tests per lot.

A laboratory moisture content test shall be undertaken for each field density test.

5.5 Proof Rolling and Plate Load Testing

Proof rolling, together with minor boxing out and refilling, of the upper surface of the bulk earthworks will be undertaken as directed by PSM. The plant to be adopted depends upon the design loads adopted by the structural engineers for each section of the site.

Plate load testing shall be undertaken at the direction of PSM at the final bulk earthworks level (BEL). Expected test frequency is approximately a day of testing for each building pad.

The contractor is to make a suitable reaction (eg 20 tonne excavator) available for the tests.

5.6 Inspection, Testing and Survey

The GITA shall at least undertake the following tasks:

Cut areas

1. For cut areas, identify the subgrade as one of the three (3) subgrade types listed in Clause 3.1 of this specification and assess that the subgrade condition of cut areas is in accordance with the subgrade condition requirements of Clause 3.1 of this specification. If “Other materials” subgrade has been approved by PSM, the GITA will be required to reference the approval in its weekly report.
2. Should Engineered Fill be required to fill overcut areas, assess that filling has been placed in accordance with this specification.

Fill areas

3. For fill areas, identify the subgrade as one of the four (4) subgrade types listed in Clause 2.1 of this specification and assess that the subgrade condition of any area prior to placement of fill material is in accordance with the subgrade preparation requirements of Clause 2.1 of this specification. If “Other materials” subgrade has been approved by PSM, the GITA will be required to reference the approval in its weekly report.
4. Assess that the base geometry of any area prior to placement of fill material is in accordance with the base geometry requirements of Clause 2.2 of this specification.
5. For each Lot, identify the material as defined in Clause 2.3.1, Clause 2.3.2 or Clause 2.3.3 of this specification and assess that the material placed is in accordance with the fill material requirements of Clause 2.3 of this specification.
6. Assess the proportion of deleterious material for each Lot is in accordance with Clause 2.3.3 of this specification.
7. Assess that the Engineered Fill has been placed in accordance with the requirements for fill zonation and placement of Clause 2.4 of this specification.
8. Assess that each Lot as presented for approval by the contractor is in accordance with the requirements for Lot definition of Clause 5.3 of this specification.
9. Ensure that the survey requirements in Clause 4 of this specification have been completed.
10. Estimate the approximate volume of Engineered Fill placed in each Lot presented for approval.
11. Conduct Lot testing in accordance with the construction control testing requirements of Clauses 5.3 and 5.4 of this specification.

12. Assess that the compaction of each Lot is in accordance with the requirements of Clause 2.5 of this specification. The GITA shall select a depth of in situ density testing that allows the density of the full layer to be assessed.

13. Assess that the moisture variation of each Lot is in accordance with the requirements for moisture control in Clause 2.6 of this specification.

14. Conduct material property testing in accordance with the material testing requirements in this specification (eg Deleterious material testing if required).

6 REPORTING AND CERTIFICATION

6.1 Reporting

The GITA shall produce at least the following reports:

1. *Subgrade Approval Reports* (a sample is attached). Such a report shall:
   - Document assessments undertaken for tasks 1 and 3 of Clause 5.6 including reporting the subgrade type.
   - Document the subgrade survey that has been undertaken.
   - Approve or reject the subgrade condition for cut areas based on task 1 of Clause 5.6.
   - Approve or reject the subgrade condition and base geometry for filling, based on tasks 3 and 4 of Clause 5.6.
2. *Lot Approval Reports* (a sample is attached). Such a report shall:
   - Document assessments, testing and survey undertaken for tasks 5 to 14 of Clause 5.6.
   - Report material identification undertaken for task 5 of Clause 5.6.
   - Report proportion of deleterious material for task 6 of Clause 5.6.
   - Report the results of testing undertaken for task 11 of Clause 5.6.
   - Approve or reject lots based on tasks 12 and 13 of Clause 5.6.
3. Material Testing Reports. Such a report shall:
   - Report the results of material property testing undertaken for task 14 of Clause 5.6.
4. *Daily Reports* (a sample is attached). Such a report shall be completed daily and shall:
   - Document time spent on site by the GITA personnel.
   - List subgrade assessments and approvals undertaken each day with reference to relevant Subgrade Approval Report(s).

- List Lots presented, accepted and approved or rejected each day, with reference to relevant Lot Approval Report(s).
- List survey undertaken each day as for task 9 of Clause 5.6 and not already documented in the Subgrade or Lot Approval Reports.
- Document other relevant activities undertaken on site that day (site instructions, breakdowns, compaction equipment used, etc.).

6.2 Certification

6.2.1 Weekly Certificates

The GITA shall produce a Weekly Certificate for any week in which earthworks are undertaken in accordance with this specification. The Weekly Certificate will cover all works from the previous Weekly Certificate until the end of work on a Saturday.

The Weekly Certificate shall transmit the following:

- Copy or reference to the complete specification document(s).
- Subgrade Approval Reports.
- Lot Approval Reports.
- Material Testing Reports.
- Daily Reports.
- Survey of subgrade geometry prior to filling or in cut areas.
- Plan survey drawing showing lot boundaries and location of density tests.
- Survey documenting filling undertaken to date and showing location of testing.

And certify that:

"All the earthworks undertaken and the subgrade condition in the cut areas [in the stated period] are documented in the above reports and have been undertaken in accordance with the Specification (Ref. PSM3276-102S REV 0 dated xxxx)."

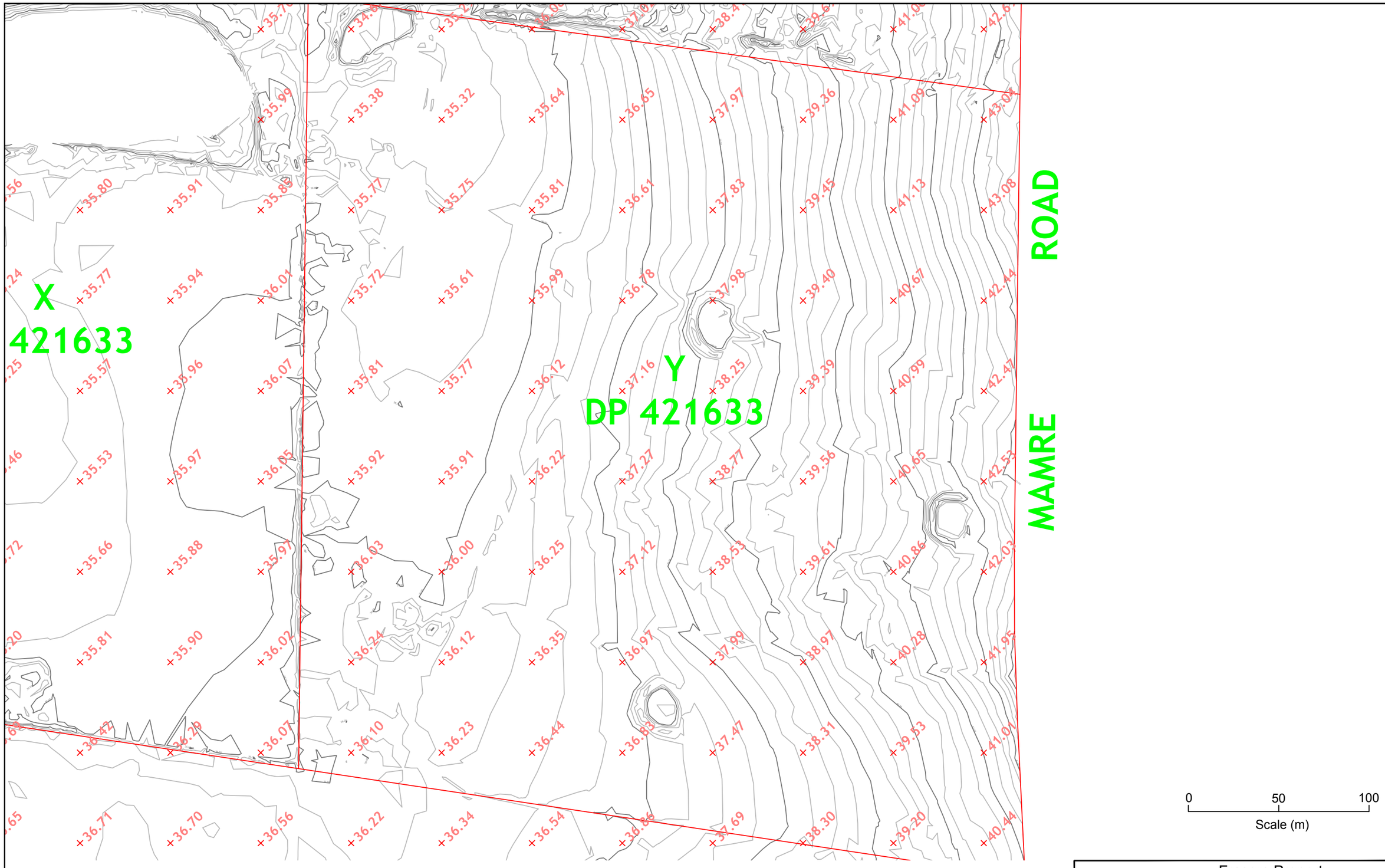
6.2.2 Interim or Final Filling Certificate

At the completion of the bulk earthworks, or as requested by the Client, the GITA shall provide an Interim or Final Filling Certificate which shall:

1. Transmit a reference list of the Weekly Certificates.
2. Provide an Excel spreadsheet presenting the results of all the acceptance testing completed by the GITA.
3. Certify that *"All the earthworks undertaken and the subgrade condition in the cut areas [in the stated period] are documented in the above reports and have been undertaken in accordance with the Specification (Ref. PSM3276-102S REV 0 dated xxxx)."*

ATTACHMENT 1

FIGURE 1



Pells Sullivan Meynink

Frasers Property
713-755 Mame Road
Kemps Creek, NSW

LOCALITY PLAN

PSM3276-102S	Figure 1

ATTACHMENT 2

SUBGRADE APPROVAL REPORT (SAMPLE ONLY)

GEOTECHNICAL INSPECTION AND TESTING AUTHORITY

NATA accreditation number

SUBGRADE APPROVAL REPORT

Client:	Contractor:
Job number:	Report number:
Project:	Technician:

Subgrade areas assessed:

Area ID	Date	Approximate extent	Subgrade description	Geometry summary	Specification reference	Compliance (Pass/Fail)	Survey reference	Approved (Yes/No)

COMMENTS:

Signed: Date:

ATTACHMENT 3

LOT APPROVAL REPORT (SAMPLE ONLY)

GEOTECHNICAL INSPECTION AND TESTING AUTHORITY

NATA accreditation number

LOT APPROVAL REPORT

Client:	Report number:
Job number:	Report date:
Project:	Technician:
Contractor:	Test methods:

LOT ID:

Sheet of

Retest (Yes/No) Original test report number:

Specification reference

Location:

Lot boundary survey reference/location:

Materials description: *(MATERIAL TYPE, colour, minor components, maximum particle size)*

Material identification: *(Identify the material as defined in Clause 2.3.1, Clause 2.3.2, Clause 2.3.3 or Clause 2.3.4 of the Specification)*

Deleterious material assessment: *(Report proportion of deleterious material)*

Layer thickness:

Accepted as Lot: (Yes/No) Date:

Approximate volume (m3) Number of tests required:

Test ID No.				
Test soil description				
Date tested:				
Grid reference				
Surveyed test locations (RL,E,N)				
Test depth (mm)				
Max size (mm)				
% Oversize material (wet)				
Field wet density (t/m^3)				
Field moisture content (%)				
PWCD (t/m^3)				
Compactive effort				
Moisture variation (%)				
HILF density ratio (%)				
TEST (Pass/Fail)				

LOT APPROVAL (Pass/Fail) Signed: Date:

ATTACHMENT 4

DAILY REPORT (SAMPLE ONLY)

GEOTECHNICAL INSPECTION AND TESTING AUTHORITY

NATA accreditation number

DAILY REPORT

Client:	Report number:
Job number:	Report date:
Project:	
Location:	Level of testing: Level 1
Contractor	Technician:

Time on site:
Time off site:

1. Subgrade Approval

Areas ID	Subgrade Approval Report No:	Comments

2. Lot Approval

Lot ID	Lot Approval Report No:	Comments

3. Survey

Type of survey	Survey undertaken by:	Reference

4. Instructions received on site

5. Instructions given on site

COMMENTS:

Signed: Date:

ATTACHMENT 5

CERTIFICATION LETTER (SAMPLE ONLY)

SAMPLE INTERIM (OR FINAL) FILLING CERTIFICATE

Letter Ref:
Date:

Addressed to EARTHWORK CONTRACTOR
ATTENTION: EARTHWORK CONTRACTOR REPRESENTATIVE

Dear Sir

RE: INTERIM (OR FINAL) FILLING CERTIFICATE
INDUSTRIAL DEVELOPMENT, BULK EARTHWORKS
CERTIFICATION OF EARTHWORKS
BETWEEN [DATE OF COMMENCEMENT] AND [DATE OF COMPLETION]

In the period between [date start] and [date finish] the contractor has undertaken earthworks in areas XXX and XXX.

During the above period:

- The GITA has prepared the following Subgrade Approval Reports:
  1. Subgrade Approval Report No 1
  2. ……
- The GITA has prepared the following Lot Approval Reports:
  1. Lot Approval Report No 1
  2. …..
- The GITA has prepared the following Daily Reports:
  1. Daily Report No 1……
  2. ……
- The following subgrade survey was undertaken:
  1. Subgrade Survey reference……
  2. ……
- The following weekly survey was undertaken:
  1. Weekly survey of week ending …….reference……..
  2. ……

Copies of all the above documents are attached.

The GITA certifies that all the earthworks undertaken in the above stated period are documented in the above reports and have been undertaken in accordance with the Specifications (ref. PSM3276-005S, dated March 2017) a copy of which is attached, with the exception of:

1. List outstanding issues (not approved subgrade, lots, unsuitable material, failed tests etc.)
2. ……..

Signed

GITA