Appendix B  Engineering logs for test pits
## Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN

<table>
<thead>
<tr>
<th>equipment type and model: BACKHOE 300mm BUCKET</th>
<th>Pit Orientation:</th>
<th>excavation dimensions: 4m long, 0.4m wide</th>
<th>Easting: 281453.11 m</th>
<th>R.L.: Surface: 9.46 m</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>method</th>
<th>penetration</th>
<th>notes, samples, tests</th>
<th>classification</th>
<th>soil type: plasticity or particle characteristics, colour, secondary and minor components.</th>
<th>material</th>
<th>moisture condition</th>
<th>consistency/density index</th>
<th>additional observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td></td>
<td></td>
<td>TOPSOIL: Silty Clay: low plasticity, brown, roots and leaf litter</td>
<td>M</td>
<td>F</td>
<td>TOPSOIL</td>
<td>Traces of sedimentary rock fragments approx 2mm in diameter at 1.7m, black in colour</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TOPSOIL: Silty Clay: Med plasticity, brown</td>
<td>M</td>
<td>S</td>
<td></td>
<td>Walls collapsing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CLAY: high plasticity, dark brown</td>
<td>M</td>
<td>VST</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Silty CLAY: medium plasticity, grey, mottled orange and brown</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inflow at 1.6m</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refusal</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sketch**  
Test pit CTP1 terminated at 2.5m
**Engineering Log - Excavation**

Client: MAUNSELL AECOM  
Principal: RTA  
Project: GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
Test pit location: REFER SITE PLAN  
Logged by: KM  
Checked by:  

**Equipment and Model:** BACKHOE 600mm BUCKET  
**Pit Orientation:**  
- Easting: 280725.32m  
- Northing: 6143711.92m  
- Datum: 17.81  
- R.L. Surface:  

**Excavation Information:**  
- Excavation Dimensions: 3m long, 0.7m wide  

<table>
<thead>
<tr>
<th>Method</th>
<th>Support</th>
<th>Notes, Samples, Tests</th>
<th>Classification Symbols</th>
<th>Material</th>
<th>Moisture</th>
<th>Density/Consistency Index</th>
<th>Additional Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td>Gravelly CLAY: medium plasticity, grey brown, with gravel, fine to coarse grained, angular</td>
<td>M</td>
<td>F</td>
<td>FILL / mixed organic material</td>
</tr>
</tbody>
</table>
|        |         |                        |                        | CLAY: high plasticity, brown grey with some orange and grey mottling | M |  | ALUVIAL?
|        |         |                        |                        | Gravelly CLAY: high plasticity, brown grey, gravel fine grained, angular | H |  | RESIDUAL |
|        |         |                        |                        | 1.8m black orange and grey mottling |  |  | 2m: clay appears to show weathered rock structure, breaks down to clay in water  
|        |         |                        |                        | 2.1m: very hard clay  

**Sketch**  
Slow Progress  
Test pit CTP2 terminated at 2.3m  
Full weight on teeth of bucket results in 45mm penetration  

---

**Legend:**  
- N: natural exposure  
- X: existing excavation  
- BH: backhoe bucket  
- R: ripper  
- E: excavator  

**Support:**  
- S: shoring  
- NI: no indication  

**Notes, Samples, Tests:**  
- Uds: undisturbed sample 60mm diameter  
- Ud: disturbed sample 63mm diameter  
- V: very hard (Vf/Vs)  
- Bs: bulk sample  
- E: environmental sample  
- R: refusal  

**Classification Symbols and Soil Description:**  
- System: based on unified classification  
- Moisture: dry (D), moist (M), wet (W)  
- Wp: plastic limit  
- Wl: liquid limit  

**Consistency/Density Index:**  
- Very soft (VS), soft (S), firm (F), stiff (st), very stiff (VS), hard (H), very hard (VH)  
- Medium dense (MD), dense (D), very dense (VD)  

---

**Diagram:**  
- Water level  
- Water inflow  
- Water outflow  
- Water level on date shown  

---
### Excavation Log - Excavation

**Client:** MAUNSELL AECOM

**Principal:** RTA

**Project:** GERRINGONG TO BOMADERY, PRINCES HWY UPGRADE

**Test pit location:** REFER SITE PLAN

**Equipment type and model:** BACKHOE 600mm BUCKET

**Pit Orientation:**
- **Easting:** 290714.41 m
- **Northing:** 6144805 m
- **Datum:** 45.12

**Excavation dimensions:**
- **Length:** 3m
- **Width:** 0.7m

**Excavation Information**

<table>
<thead>
<tr>
<th>Method</th>
<th>Support</th>
<th>Notes, Samples, Tests</th>
<th>Classification</th>
<th>Material</th>
<th>Soil Type</th>
<th>Consistency/Density Index</th>
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<tbody>
<tr>
<td>1</td>
<td>Water</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
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</tr>
<tr>
<td>3</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Material Substance**

- *Silty CLAY: low plasticity, brown, roots / root fibres*
- *CLAY: high plasticity, orange brown, and grey*
- *Gravelly CLAY: high plasticity, brown, mottled orange, white, purple, gravel is surrounded to angular, fine to coarse grained, (not break down to clay in water)*

**Structure and Additional Observations**

- ALLUVIAL
- ALLUVIAL/RESIDUAL
- Rounded boulders within clay between 0.8m and 1.1m, charcoal also present, burnt pieces, 20mm diameter

**Sketch**

- Very Slow Progress
- Test pit CTP3 terminated at 2.4m
## Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN  
**Logged by:** KM

### Excavation Information

<table>
<thead>
<tr>
<th>equipment type and model: BACKHOE 600mm BUCKET</th>
<th>Pit Orientation:</th>
<th>Easting: 960118 13 m</th>
<th>Northing: 6142305.03 m</th>
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</thead>
<tbody>
<tr>
<td>excavation dimensions: 3m long 0.7m wide</td>
<td>datnum:</td>
<td></td>
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### Support, water, notes, samples, tests

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<tr>
<th>method</th>
<th>support</th>
<th>notes samples, tests</th>
<th>water</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
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</table>

### Material Substances

<table>
<thead>
<tr>
<th>classification</th>
<th>symbol</th>
<th>material</th>
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</thead>
<tbody>
<tr>
<td>TOPSOIL FILL</td>
<td>Clayey Gravel: fine to coarse grained, angular, gravel (blue brown)</td>
<td></td>
</tr>
<tr>
<td>CLAY</td>
<td>high plasticity, brown, with black mottling, some fine to coarse grained gravel, angular</td>
<td></td>
</tr>
<tr>
<td>CLAY</td>
<td>high plasticity, orange mottled red, (increasing mottle with depth) some fine to coarse grained, subangular to subrounded gravel</td>
<td></td>
</tr>
<tr>
<td>Clayey GRAVEL</td>
<td>high plasticity, red orange with grey mottle, gravel is fine to coarse grained, subangular to angular</td>
<td></td>
</tr>
</tbody>
</table>

### Structure and Additional Observations

<table>
<thead>
<tr>
<th>consistency/density index</th>
<th>classification/symbols and soil description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VS</td>
<td>based on unified classification system</td>
</tr>
<tr>
<td>VS</td>
<td>moisture</td>
</tr>
<tr>
<td>Vs</td>
<td>D dry</td>
</tr>
<tr>
<td>S</td>
<td>M moist</td>
</tr>
<tr>
<td>F</td>
<td>W wet</td>
</tr>
<tr>
<td>St</td>
<td>Wp plastic limit</td>
</tr>
<tr>
<td>Sf</td>
<td>W, liquid limit</td>
</tr>
</tbody>
</table>

### Sketch

Test pit CTP4 terminated at 2.5m
## Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN  

**Excavation No.:** CTP4  
**Sheet:** 2 of 2  
**Project No.:** GEOTUNAN02580-AA  
**Date started:** 20.3.2007  
**Date completed:** 20.3.2007  
**Logged by:** KM  
**Checked by:**  

### Equipment and Model
- **Equipment type and model:** BACKHOE 600mm BUCKET
- **Pit Orientation:**
  - Easting: 280118.13 m
  - Northing: 6142305.03 m
  - R.L. Surface: 43.90

### Excavation Dimensions
- **Excavation dimensions:** 3m long, 0.7m wide

### Excavation Information

<table>
<thead>
<tr>
<th>method</th>
<th>penetration</th>
<th>notes</th>
<th>support</th>
<th>water</th>
<th>notes, samples, tests</th>
<th>classification symbol</th>
<th>material</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>soil type: plasticity or particle characteristics, colour, secondary and minor components.</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Sketch

**Support Symbols**
- **S:** Shoring
- **N:** Nail
- **B:** Excavator

**Penetration Symbols**
- **H:** Hard
- **F:** Firm

**Water Levels**
- **W:** Water level
- **W:** Water inflow
- **W:** Water outflow

**Classification Symbols and Soil Description**
- **VS:** Very soft
- **S:** Soft
- **F:** Firm
- **St:** Stiff
- **VS:** Very stiff
- **H:** Hard
- **Fl:** Fruible
- **VL:** Very loose
- **L:** Loose
- **MD:** Medium dense
- **D:** Dense
- **VD:** Very dense

**Notes, Samples, Tests**
- **Ud:** Undisturbed sample diameter
- **Ue:** Undisturbed sample diameter
- **D:** Disturbed sample
- **V:** Vane shear (kPa)
- **Rs:** Bulk sample
- **E:** Environmental sample
- **R:** Refusal

**Additional Observations**
- **Additional Data**

---

*Form: GEO 5.2 Issue 8 Rev 2*
### Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
**Logged by:** KM  
**Checked by:**

---

**Excavation No.:** CTP5  
**Sheet:** 1 of 1  
**Project No.:** GEOTUNA02580-AA  
**Date started:** 20.3.2007  
**Date completed:** 20.3.2007  
**Test pit location:** REFER SITE PLAN

---

### Excavation Information

<table>
<thead>
<tr>
<th>method</th>
<th>support</th>
<th>water</th>
<th>notes, samples, tests</th>
<th>material</th>
<th>structure and additional observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>soil type: plasticity or particle characteristics, colour, secondary and minor components.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>clayey gravel: fine to coarse grained, subangular, grey brown, medium plasticity</td>
<td>FILL</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>clayey gravel: coarse grained, angular, grey with red orange/black mottles/staining</td>
<td>ALLUVIAL</td>
</tr>
</tbody>
</table>

**Notes:**  
- Very Slow Progress in Rock  
- Test pit CTP5 terminated at 2m

---

### Sketch

- Sketch indicating no resistance ranging to refusal

---

### Equipment
- Type: Ditch Witch  
- Model: 800mm Ditch Witch  
- Orientation: Northing: 6144628.68 m  
- Datum: 2007

---

### Classification Symbols and Soil Description

<table>
<thead>
<tr>
<th>moisture</th>
<th>consistency/density index</th>
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</thead>
<tbody>
<tr>
<td>V</td>
<td>very soft</td>
</tr>
<tr>
<td>S</td>
<td>soft</td>
</tr>
<tr>
<td>D</td>
<td>stiff</td>
</tr>
<tr>
<td>VSS</td>
<td>very stiff</td>
</tr>
<tr>
<td>H</td>
<td>hard</td>
</tr>
<tr>
<td>Ps</td>
<td>fissile</td>
</tr>
<tr>
<td>VL</td>
<td>very loose</td>
</tr>
<tr>
<td>L</td>
<td>loose</td>
</tr>
<tr>
<td>MD</td>
<td>medium dense</td>
</tr>
<tr>
<td>D</td>
<td>dense</td>
</tr>
<tr>
<td>VD</td>
<td>very dense</td>
</tr>
</tbody>
</table>

---

### Notes

- U<sub>90</sub>: undisturbed sample 90mm diameter  
- U<sub>60</sub>: undisturbed sample 60mm diameter  
- V<sub>dry</sub>: vane shear (kPa)  
- Bs: bulk sample  
- E: environmental sample  
- R: refusal

---

### Support

- S1: shoring  
- N: nailing  
- B: backhoe bucket  
- R: ripper  
- E: excavator

---

### Water Levels

- Water level on date shown  
- Water inflow  
- Water outflow

---

### Additional Information

- Geotechnics Report  
- Report Date: 20.3.2007  
- Project: GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
- Client: MAUNSELL AECOM  
- Principal: RTA
### Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN  
**Logged by:** KM  
**Checked by:**

**Excavation No.:** CTP6  
**Sheet:** 2 of 2  
**Project No.:** GEOTUNAN02580-AA  
**Date started:** 20.3.2007  
**Date completed:** 20.3.2007

**Equipment type and model:** RACKHOF 600mm RUCKET  
**Pit Orientation:**  
- **Easting:** 281931.62 m  
- **R.L. Surface:** 20  
**Excavation dimensions:** 4m long, 0.7m wide  
- **Northing:** 6145476.17 m  
**Datum:**

<table>
<thead>
<tr>
<th>excavation information</th>
<th>material substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>method</td>
<td>penetration</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>N</td>
<td>natural exposure</td>
</tr>
</tbody>
</table>
X | backhoe bucket |  
D | bulkhead blade |  
E | ripper |  
R | excavator |  
| | | S | shoring | N | nil |  
| | | U | disturbed sample | 09mm diameter |  
| | | D | disturbed sample | 03mm diameter |  
| | | V | vane shear (kPa) |  
| | | Bs | bulk sample |  
| | | E | environmental sample |  
| | | R | refusal |  
| | | | |  

**Slow Progress**  
Test pit CTP6 terminated at 2.65m

**Sketch**

<table>
<thead>
<tr>
<th>method</th>
<th>support</th>
<th>notes, samples, tests</th>
<th>classification symbols and soil description</th>
<th>consistency/density index</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>natural exposure</td>
<td>existing excavation</td>
<td>based on unified classification system</td>
<td>very soft</td>
</tr>
<tr>
<td>X</td>
<td>backhoe bucket</td>
<td></td>
<td></td>
<td>soft</td>
</tr>
<tr>
<td>B</td>
<td>bulkhead blade</td>
<td></td>
<td></td>
<td>firm</td>
</tr>
<tr>
<td>R</td>
<td>ripper</td>
<td></td>
<td></td>
<td>stiff</td>
</tr>
<tr>
<td>E</td>
<td>excavator</td>
<td></td>
<td></td>
<td>VS</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>S</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
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<td>H</td>
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<td></td>
<td>D</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>VD</td>
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Engineering Log - Excavation

Client: MAUNSELL AECOM
Principal: RTA
Project: GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE
Test pit location: REFER SITE PLAN

Excavation No. CTP7
Sheet 1 of 1
Project No: GEOTUNAN02580-AA
Date started: 21.3.2007
Date completed: 21.3.2007
Logged by: KM
Checked by: 

Excavation information

<table>
<thead>
<tr>
<th>method</th>
<th>penetration</th>
<th>support</th>
<th>water</th>
<th>notes samples, tests, etc</th>
<th>depth (m)</th>
<th>graphic symbol</th>
<th>material</th>
<th>soil type: plasticity or particle characteristics, colour, secondary and minor components.</th>
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<tbody>
<tr>
<td>E</td>
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<td></td>
<td></td>
<td>29.5</td>
<td>TOPSOIL: Gravelly Clay; low plasticity, brown</td>
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<td>F/SI</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>29.0</td>
<td>GRAVEL: fine to coarse grained, subrounded and angular, brown</td>
<td>M</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>29.0</td>
<td>CLAY: high plasticity, dark red and brown mottled</td>
<td>M</td>
<td>VS/H</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>29.0</td>
<td>CLAY: high plasticity, grey and red mottled</td>
<td>M</td>
<td>H</td>
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<td></td>
<td>28.5</td>
<td></td>
<td>M</td>
<td>RESIDUAL</td>
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</table>

Sketch

Test pit CTP7 terminated at 2.4m

Notes, samples, tests

<table>
<thead>
<tr>
<th>method</th>
<th>penetration</th>
<th>support</th>
<th>water</th>
<th>notes, samples, tests</th>
<th>classification symbols and soil description</th>
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<tbody>
<tr>
<td>N</td>
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<td>based on unified classification system</td>
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<td>moisture</td>
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<td></td>
<td></td>
<td>D dry</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>M moist</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>W wet</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Wp plastic limit</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>W, liquid limit</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>classification index</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>VS very soft</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>S soft</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F firm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Gt stiff</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>VSB very stiff</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>H hard</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>PH very hard</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>VC very loose</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>L loose</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>MD medium dense</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>D dense</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>VD very dense</td>
</tr>
</tbody>
</table>

Legend

- Water level
- Water inflow
- Water outflow
Engineering Log - Excavation

Client: MAUNSELL AECOM
Principal: RTA
Project: GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE
Test pit location: REFER SITE PLAN

Excavation No. CTP8
Sheet 1 of 2
Project No: GEOTUNAN02580-AA
Date started: 21.3.2007
Date completed: 21.3.2007
Logged by: KM
Checked by: 

equipment type and model: RACKHOFF 600mm RICKFT
Pit Orientation: 
excavation dimensions: 4m long, 0.7m wide
Northing: 6147782.88 m
datum: 

excavation information

<table>
<thead>
<tr>
<th>method</th>
<th>support</th>
<th>notes, samples, tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

material

material classification symbol

TOPSOIL: Clay: low plasticity, dark brown, roots, root
clumps
FILL: Clayey Gravel: fine to coarse grained, angular;
some cobbles up to 150mm
Clayey Sandy GRAVEL: low plasticity, sand and gravel is fine to coarse grained, gravel is angular
CLAY: high plasticity, dark grey, medium gravel sized
charcoal fragments present, (faint orange mottle)

structure and additional observations

Sketch

method

N natural exposure
X existing excavation
BH backhoe bucket
D bulk cutter blade
E excavator

consistency/density index

classification symbols and soil description

consistency/density index

based on unified classification system

moisture

D dry
M moist
W wet
Wp plastic limit
Wt liquid limit

VS very soft
S soft
F firm
St stiff
VB soft
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

Notes: All sample testing performed in accordance with IS 1726:1993

SCEC 600mm RICKFT
### Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN  
**Excavation No.:** CTP8  
**Logged by:** KM  
**Checked by:**  
**Date started:** 21.3.2007  
**Date completed:** 21.3.2007

| equipment type and model: | RACKOFF 800mm RUCKFET  
|--------------------------|----------------------  
| Pit Orientation: |  
| Fading: | 287659.64 m  
| R.L. Surface: | 5.2  
| excavation dimensions: | 4m long, 0.7m wide  
| Northing: | 6147782.98 m  
| datum: |  

### Excavation Information

<table>
<thead>
<tr>
<th>method</th>
<th>penetration</th>
<th>support</th>
<th>notes, samples, tests</th>
<th>material</th>
<th>additional observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td></td>
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<td></td>
</tr>
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<td>2</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Notes:** Test pit CTP8 terminated at 2.6m

### Sketch

- **Method:**
  - W natural exposure
  - X existing excavation
  - BH backhoe bucket
  - B bulker loader
  - R ripper
  - E excavator

- **Support:**
  - S shoring
  - N nil

- **Penetration:**
  - 1.5 no resistance
  - 2.0 no resistance

- **Water:**
  - Water level
  - Water inflow
  - Water outflow

- **Notes, Samples, Tests:**
  - Undisturbed sample
  - Disturbed sample

- **Material:**
  - Soil type: plasticity or particle characteristics, colour, secondary and minor components

- **Consistency/Density Index:**
  - VS very soft
  - S soft
  - F firm
  - Sk stiff
  - VSt very stiff
  - H hard
  - Ps plastic
  - Wt very loose
  - L loose
  - MD medium dense
  - D dense
  - VD very dense
# Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN  
**Excavation No.:** CTP9  
**Project No.:** GEOTUNAN02580-AA  
**Date started:** 22.3.2007  
**Date completed:** 22.3.2007  
**Logged by:** KM  
**Checked by:**  

### Excavation Information

<table>
<thead>
<tr>
<th>method</th>
<th>support</th>
<th>notes, samples, tests</th>
<th>material</th>
<th>soil type: plasticity or particle characteristics, colour, secondary and minor components.</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td></td>
<td></td>
<td>TOPSOIL</td>
<td>Silty Clay: low plasticity, black / brown, roots, root fibres</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ClAY:</td>
<td>dark red brown, low to medium plasticity</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CClAY:</td>
<td>medium to high plasticity, dark red brown, mottled grey</td>
</tr>
</tbody>
</table>

### Sketch

- TOPSOIL
- ALLUVIAL
- RESIDUAL?

### Classification Symbols and Soil Description

- **Vegetation:**
  - Vs: very soft
  - S: soft
  - F: firm
  - St: stiff
  - VSt: very stiff
  - H: hard
  - Ph: firm
  - VL: very loose
  - L: loose
  - MD: medium dense
  - D: dense
  - VD: very dense

- **Consistency/Density Index**

- **Moisture:**
  - D: dry
  - M: moist
  - W: wet

- **W/p Limit:**
  - W: liquid limit

- **Classification:**
  - Based on unified classification system

- **Consistency/Density Index:**

- **Moisture:**
  - D: dry
  - M: moist
  - W: wet

- **W/p Limit:**
  - W: liquid limit
## Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN  
**Logged by:** KM  
**Checked by:**

### Excavation Details
- **Excavation No.:** CTP9  
- **Sheet:** 2 of 2  
- **Project No.:** GEOTUNAN02580-AA  
- **Date started:** 22.3.2007  
- **Date completed:** 22.3.2007  
- **Equipment type and model:** BACKHOE 600mm BUCKET  
- **Pit Orientation:** Easting: 287623.52 m  
  Northing: 8148700.33 m  
- **Datum:** R.L. Surface: 11.48 m  
- **Excavation dimensions:** 4m long, 0.7m wide

### Excavation Information

<table>
<thead>
<tr>
<th>Method</th>
<th>Penetration</th>
<th>Support</th>
<th>Notes, Samples, Tests</th>
<th>Classification</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes
- **Soil Type:** Plasticity or Particle Characteristics, Colour, Secondary and Minor Components.
- **Material:** CLAY: medium to high plasticity, dark red brown, mottled grey (continued)
- **Test pit CTP9 terminated at 2.7m**

### Sketch

- **Method:** Natural Exposure  
- **Support:** S: snoing  
- **Penetration:** 3: no resistance

### CONSISTENCY/TEXTURE
- **Classification symbols and soil description**: Based on unified classification system
- **Moisture:**
  - D: dry
  - M: moist
  - W: wet
- **Consistency/Density index:**
  - LS: very loose
  - SL: slight
  - VS: very stiff
  - HS: hard
  - Ps: plastic
  - PI: plasticity index
  - WL: plastic limit
  - Lo: liquid limit
  - MD: medium dense
  - D: dense
  - LD: very dense
  - LS: very loose
Engineering Log - Excavation

Client: MAUNSELL AECOM
Principal: RTA
Project: GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE
Test pit location: REFER SITE PLAN

Excavation No. CTP10
Sheet 1 of 2
Project No: GEOTUNAN02580-AA
Date started: 21.3.2007
Date completed: 21.3.2007
Logged by: KM
Checked by:

equipment type and model: BACKHOE 600mm BUCKET
Pit Orientation: Easting: 289413.76 m
excavation dimensions: 4m long, 0.7m wide
Northing: 6148445.21 m
datum: R.L. Surface: 4.69

material substance

<table>
<thead>
<tr>
<th>method</th>
<th>penetration</th>
<th>support samples, tests, etc</th>
<th>notes, samples, tests</th>
<th>classification symbol</th>
<th>material</th>
<th>soil type: plasticity or particle characteristics, colour, secondary and minor components.</th>
<th>moisture condition</th>
<th>semi-solid/liquid limit</th>
<th>effective kPa</th>
<th>structure and additional observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TOPSOIL: Clay: low plasticity, brown, roots, root fibres</td>
<td>M</td>
<td>P/FSt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CLAY: high plasticity, grey/brown, mottled orange/brown</td>
<td>M</td>
<td>St</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Colour change: grey, mottled dark orange and red</td>
<td></td>
<td></td>
<td></td>
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</table>

Sketch

method
N natural exposure
X existing excavation
BH backhoe bucket
D bulldozer blade
R ripper
E excavator

support
N natural exposure
S stnning
M mtald

penetration
L shear box no resistance ranging to refusal

notes, samples, tests
Uu undisturbed sample comm diameter
Us undisturbed sample 63mm diameter
D disturbed sample
V vane shear (kPa)
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description

moisture
D dry
M moister
W wet
Wp plastic limit
Wi liquid limit

system
Vs very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb brittle
VL very loose
L loose
MD medium dense
D dense
VD very dense
**Engineering Log - Excavation**

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN  
**Excavation No.:** CTP10  
**Date started:** 21.3.2007  
**Date completed:** 21.3.2007  
**Logged by:** KM  
**Checked by:**

<table>
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<tr>
<th>equipment type and model</th>
<th>RACKHOF 800mm RUCKFET</th>
<th>Pit Orientation:</th>
<th>Easting: 289413.76 m</th>
<th>R.L. Surface: 4.69</th>
</tr>
</thead>
<tbody>
<tr>
<td>excavation dimensions:</td>
<td>4m long, 0.7m wide</td>
<td>Noth: 6148445.21 m</td>
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<table>
<thead>
<tr>
<th>excavation information</th>
<th>material substance</th>
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<td>method</td>
<td>penetration</td>
</tr>
<tr>
<td>1</td>
<td>support</td>
</tr>
<tr>
<td>N</td>
<td>natural exposure</td>
</tr>
<tr>
<td>X</td>
<td>existing excavation</td>
</tr>
<tr>
<td>B</td>
<td>backhoe bucket</td>
</tr>
<tr>
<td>S</td>
<td>bulldozer blade</td>
</tr>
<tr>
<td>E</td>
<td>excavator</td>
</tr>
<tr>
<td>2</td>
<td>Bs</td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Test pit CTP10 terminated at 2.7m

---

**Sketch**

---

**Method:**
- N: natural exposure
- X: existing excavation
- B: backhoe bucket
- S: bulldozer blade
- E: excavator

**Support:**
- S: shoring
- N: nil

**Penetration:**
- No resistance ranging to refusal

**Notes, Samples, Tests:**
- U<sub>d</sub>: undisturbed sample 50mm diameter
- U<sub>p</sub>: undisturbed sample 63mm diameter
- D: disturbed sample
- V: vane shear (kPa)
- B: bulk sample
- E: environmental sample
- R: refusal

**Classification Symbols and Soil Description:**
- Based onUnified Classification System

<table>
<thead>
<tr>
<th>Moisture</th>
<th>Dr</th>
<th>M</th>
<th>W</th>
<th>W&lt;sub&gt;p&lt;/sub&gt;</th>
<th>W&lt;sub&gt;l&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>D: dry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M: medium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W: wet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W&lt;sub&gt;p&lt;/sub&gt;: plastic limit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W&lt;sub&gt;l&lt;/sub&gt;: liquid limit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Consistency/Density Index:**
- VS: very soft
- S: soft
- F: firm
- Sk: stiff
- VSH: very stiff
- H: hard
- Fh: hard
- Tp: fragile
- VL: very loose
- L: loose
- MD: medium dense
- D: dense
- D: very dense

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From: GEO 5 Issue 5 Rev 2

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**Date:** GEO 5 Issue 5 Rev 2
Engineering Log - Excavation

Client: MAUNSELL AECOM
Principal: RTA
Project: GERRINGONG TO BOMADERGY, PRINCES HWY UPGRADE
Test pit location: REFER SITE PLAN

| equipment type and model: BACKHOE 600mm RUCKET | Pit Orientation: | Fastig: 288637.26 m | R.L. Surface: 71.64 |
| excavation dimensions: 4m long, 0.7m wide | Northing: 6150263.91 m | datum: |

<table>
<thead>
<tr>
<th>method</th>
<th>penetration</th>
<th>support</th>
<th>notes, samples, tests</th>
<th>depth (m)</th>
<th>graphic log</th>
<th>classification symbol</th>
<th>material</th>
<th>moisture</th>
<th>consistency/density index</th>
<th>structure and additional observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TOPSOIL: Silty Clay: low plasticity, dark brown</td>
<td>M</td>
<td>FI(2)</td>
<td></td>
<td>ALLUVAL</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Silty CLAY: low to medium plasticity, dark brown</td>
<td>VST</td>
<td>X</td>
<td></td>
<td>ALLUVAL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>ALLUVAL</td>
</tr>
</tbody>
</table>

Sketch

notes, samples, tests:
- Undisturbed sample 50mm diameter
- Undisturbed sample 63mm diameter
- Vane shear (kPa)
- Bulk sample
- Environmental sample

classification symbols and soil description:
- Based on unified classification system

moisture:
- D: dry
- M: moist
- W: wet

Wp: plastic limit
Wc: liquid limit

VS: very soft
S: soft
F: firm
D: stiff
VS: very stiff
H: hard
Ph: flaky
L: loose
MD: medium dense
D: dense
VD: very dense
### Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERGY, PRINCES HWY UPGRADE  
**Logged by:** KM  
**Date started:** 22.3.2007  
**Date completed:** 22.3.2007

**Test pit location:** REFER SITE PLAN  
**Checked by:**

<table>
<thead>
<tr>
<th>equipment type and model</th>
<th>Pit Orientation</th>
<th>Excavation dimensions:</th>
<th>Datum:</th>
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<tbody>
<tr>
<td>RACKHOF 600mm</td>
<td>988637 76m</td>
<td>4m long 0.7m wide</td>
<td>6150263.91m</td>
</tr>
<tr>
<td>RL: Surface 91fd</td>
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</table>

<table>
<thead>
<tr>
<th>excavation information</th>
<th>material substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>method</td>
<td>penetration</td>
</tr>
<tr>
<td>1</td>
<td>W</td>
</tr>
</tbody>
</table>
| 2 | ... | ... | ... | ... | Very Slow Progress  
Test pit CTP11 terminated at 2.7m |
| 3 | ... | ... | ... | ... | |
| 4 | ... | ... | ... | ... | |
| 5 | ... | ... | ... | ... | |

**Sketch**

**Notes:**
- Water level on date shown
- Water inflow
- Water outflow

**Support:**
- Shoring N 8m
- Backhoe bucket 8m
- Bullhoe ladder 8m

**Classification Symbols and Soil Description:**
- Moisture: D dry, M moist, W wet
- Plastic limit: Wp, LIQ limit: W, soil system: S soft, F firm, Dt stiff, VST very stiff, H hard, Ph tractive, VL very loose, L loose, MD medium dense, D dense, VD very dense
## Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN

### Excavation Information

- **Equipment type and model:** BACKHOE 600mm BUCKET  
- **Pit Orientation:**  
- **Excavation dimensions:** 4m long, 0.7m wide  
- **Datum:**  
- **Easting:** 291522.21 m  
- **Northing:** 6149469.39 m  
- **R.L. Surface:** 10.21  
- **Project No:** GEOTUNAN02580-AA  
- **Excavation No:** CTP12  
- **Date started:** 22.3.2007  
- **Logged by:** KM  
- **Date completed:** 22.3.2007  
- **Checked by:**

### Material Substance

<table>
<thead>
<tr>
<th>Method</th>
<th>Support</th>
<th>Water</th>
<th>Notes, Samples, Tests</th>
<th>Classification Symbol</th>
<th>Material</th>
<th>Moisture</th>
<th>Consistency/Density Index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TOPSOIL: Silty Clay: low plasticity, dark brown, roots, root fibres</td>
<td>M</td>
<td>F/SIT</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CLAY: low plasticity, dark red, root fibres</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CLAY: high plasticity, grey, mottled orange</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Rock structure visible within clay
- Gradual colour change to grey mottled orange-red

### Sketch

-Gradient

### Notes

- Water levels shown on site
- Water inflow
- Water outflow

### Symbol Key

- N: Natural exposure
- X: Existing excavation
- BH: Backhoe bucket
- D: Bulldozer blade
- R: Ripper
- E: Excavator

### Classification Symbols and Soil Description

- $U_{ds}$: Undisturbed sample 63mm diameter
- $U_{ds}$: Undisturbed sample 63mm diameter
- $V$: Vane shear (kPa)
- $B_{s}$: Bulk sample
- $E$: Environmental sample
- $R$: Refusal

### Consistency/Density Index

- VS: Very soft
- S: Soft
- F: Firm
- D: Stiff
- VS: Very stiff
- H: Hard
- FH: Failure
- VL: Very loose
- L: Loose
- MD: Medium dense
- D: Dense
- VB: Very dense
## Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN  
**Sheet:** 2 of 2  
**Project No.:** GEOTUNAN02580-AA  
**Excavation No.:** CTP12  
**Date started:** 22.3.2007  
**Date completed:** 22.3.2007  
**Logged by:** KM  
**Checked by:** 

### Equipment Type and Model
- **Type:** BACKHOE 600mm BUCKET  
- **Pit Orientation:** 
- **Easting:** 291522.21 m  
- **Northing:** 8149469.39 m  
- **Datum:** 10.21

### Excavation Dimensions
- **4m long, 0.7m wide**

### Excavation Information

<table>
<thead>
<tr>
<th>method</th>
<th>penetration</th>
<th>support</th>
<th>water</th>
<th>notes samples, tests, etc</th>
<th>depth (m)</th>
<th>classification symbol</th>
<th>material</th>
<th>structure and additional observations</th>
</tr>
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<tbody>
<tr>
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<tr>
<td>2</td>
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<td></td>
<td>0.75</td>
<td>BS</td>
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<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
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<td>5.0</td>
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</tr>
</tbody>
</table>

**Test pit CTP12 terminated at 2.60m**

### Sketch

---

**Classification Symbols and Soil Description**
- **System:** based on unified classification
- **Moisture:**
  - D: dry
  - M: moist
  - W: wet
- **Consistency/Density Index:**
  - VS: very soft
  - S: soft
  - F: firm
  - Gh: stiff
  - VSt: very stiff
  - H: hard
  - Pe: plastic
  - VL: very loose
  - L: loose
  - MD: medium dense
  - D: dense
  - VD: very dense

---

**Notes:**
- **water level:** on date shown
- **water inflow:**
- **water outflow:**
### Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN

**Excavation No.:** CTP13  
**Project No.:** GEOTUNAN02580-AA  
**Date started:** 22.3.2007  
**Date completed:** 22.3.2007  
**Logged by:** KM  
**Checked by:**

#### Excavation Information

<table>
<thead>
<tr>
<th>Material Substance</th>
<th>Soil Type</th>
<th>Plasticity or Particle Characteristics, Colour, Secondary and Minor Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOPSOIL</td>
<td>Silty Clay</td>
<td>low plasticity, black/brown, root fibres</td>
</tr>
<tr>
<td>CLAY</td>
<td>medium to high plasticity, red and orange mottled, traces of fine to medium grained gravel, (break down to clay in water)</td>
<td></td>
</tr>
<tr>
<td>CLAY</td>
<td>medium plasticity, orange/red, some grey motting</td>
<td></td>
</tr>
<tr>
<td>CLAY</td>
<td>high plasticity, red and grey mottled</td>
<td></td>
</tr>
</tbody>
</table>

#### Sketch

**Sketch**

**Method:**
- N: natural exposure  
- X: existing excavation  
- BH: backhoe bucket  
- a: bullbarbed blade  
- R: ripper  
- E: excavator

**Support:**
- S: straining  
- N: nil

**Notes, Samples, Tests:**
- U<sub>50</sub>: undisturbed sample 50mm diameter  
- U<sub>d</sub>: undisturbed sample 65mm diameter  
- D: disturbed sample  
- V: vane shear (kPa)  
- Bs: bulk sample  
- E: environmental sample  
- R: refusal

**Classification Symbols and Soil Description:**
- Based on unified classification system

**Consistency/Density Index:**
- V3: very loose  
- S: soft  
- F: firm  
- St: stiff  
- VS: very stiff  
- H: hard  
- Ms: moist  
- Fb: friable  
- VL: very loose  
- L: loose  
- Md: medium dense  
- D: dense  
- VD: very dense

**Moisture:**
- D: dry  
- Wp: plastic limit  
- W<sub>i</sub>: liquid limit
**Engineering Log - Excavation**

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN  

**Excavation No.:** CTP13  
**Sheet:** 2 of 2  
**Project No.:** GEOTUNAN02580-AA  
**Date started:** 22.3.2007  
**Date completed:** 22.3.2007  
**Logged by:** KM  
**Checked by:**  

---

**Excavation Information**

<table>
<thead>
<tr>
<th>method</th>
<th>penetration</th>
<th>support</th>
<th>water</th>
<th>notes, samples, tests</th>
<th>material</th>
<th>material substance</th>
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</thead>
<tbody>
<tr>
<td>1</td>
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<td></td>
<td></td>
<td></td>
<td>soil type: plasticity or particle characteristics, colour, secondary and minor components.</td>
</tr>
<tr>
<td>2</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>moisture condition</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>consistency/density index</td>
</tr>
</tbody>
</table>

---

**Material:** CLAY: high plasticity, red, grey mottled (continued)

**Notes:** Test pit CTP13 terminated at 2.6m

---

**Sketch**

---

**Method and Penetration**

- N: natural exposure
- X: existing excavation
- BH: backhoe bucket
- B: bulldozer blade
- R: ripper
- E: excavator

**Support**

- S: shoring
- N: nil

**Notes, Samples, Tests**

- U<sub>50</sub>: undisturbed sample 50mm diameter
- U<sub>60</sub>: undisturbed sample 60mm diameter
- D: disturbed sample
- V: vane shear (kPa)
- Bs: bulk sample
- E: environmental sample
- R: refusal

---

**Classification Symbols and Soil Description**

- Vs: very soft
- S: soft
- F: firm
- Gt: stiff
- VSI: very stiff
- H: hard
- Ph: firm
- VL: very loose
- Wp: plastic limit
- W: liquid limit

---

**Consistency/Density Index**

- Lo: loose
- MD: medium dense
- D: dense
- VD: very dense
# Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN  
**Logged by:** KM  
**Checked by:** 

## Excavation Information

<table>
<thead>
<tr>
<th>method</th>
<th>penetration</th>
<th>notes, samples, tests</th>
<th>material symbol</th>
<th>material</th>
<th>moisture content</th>
<th>shear strength</th>
<th>structure and additional observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>NONE OBSERVED</td>
<td>Bulk sample</td>
<td>TOPSOIL: Clay: low to medium plasticity, dark brown</td>
<td>M</td>
<td>P/S1</td>
<td>TOPSOIL</td>
<td>RESIDUAL?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CLAY: high plasticity, dark red</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CLAY: high plasticity, orange and grey mottled</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SILTSTONE: highly to moderately weathered, grey-brown, stained orange</td>
<td></td>
<td></td>
<td></td>
<td>HW/MW Rock</td>
</tr>
</tbody>
</table>

**Excavation dimensions:** 4m long, 0.7m wide  
**Easting:** 293020.26 m  
**Northing:** 6149838.89 m  
**Datum:** 

## Sketch

**Method:**  
N: natural exposure  
X: existing excavation  
BH: backhoe bucket  
B: bulldozer blade  
R: ripper  
E: excavator  

**Support:**  
S: shoring  
N: nil  

**Penetration:**  
1-2-3: no resistance ranging to refusal  
W: water level on date shown  

**Notes, Samples, Tests:**  
U<sub>n</sub>: undisturbed sample 30mm diameter  
U<sub>d</sub>: undisturbed sample 63mm diameter  
D: disturbed sample  
V: vane shear (kPa)  
Bs: bulk sample  
E: environmental sample  
R: refusal  

**Classification Symbols and Soil Description:**  
Based on unified classification system

<table>
<thead>
<tr>
<th>moisture</th>
<th>consistency/density index</th>
</tr>
</thead>
<tbody>
<tr>
<td>D: dry</td>
<td>VS: very soft</td>
</tr>
<tr>
<td>M: moist</td>
<td>S: soft</td>
</tr>
<tr>
<td>W: wet</td>
<td>F: firm</td>
</tr>
<tr>
<td>Wp: plastic limit</td>
<td>St: soft</td>
</tr>
<tr>
<td>Wl: liquid limit</td>
<td>VS: very stiff</td>
</tr>
<tr>
<td>L: loose</td>
<td>H: hard</td>
</tr>
<tr>
<td>VL: very loose</td>
<td>Fb: friable</td>
</tr>
<tr>
<td>MD: medium dense</td>
<td>L: loose</td>
</tr>
<tr>
<td>D: dense</td>
<td>VD: very dense</td>
</tr>
</tbody>
</table>

**Classification of Material:**  
TOPSOIL  
CLAY  
SILTSTONE  
RESIDUAL  
HW/MW Rock
## Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN  
**Excavation No.:** CTP16  
**Sheet:** 1 of 1  
**Project No.:** GEOTUNAN02580-AA  
**Date started:** 23.3.2007  
**Date completed:** 23.3.2007  
**Logged by:** KM  
**Checked by:**

<table>
<thead>
<tr>
<th>equipment type and model:</th>
<th>BACKHOE 600mm BUCKET</th>
<th>Pit Orientation:</th>
<th>Easting: 292243.06 m</th>
<th>R.L. Surface: 24.08</th>
</tr>
</thead>
<tbody>
<tr>
<td>excavation dimensions:</td>
<td>4m long 0.7m wide</td>
<td>Northing: 6150893.76 m</td>
<td>datum:</td>
<td></td>
</tr>
</tbody>
</table>

### Excavation Information

<table>
<thead>
<tr>
<th>Method</th>
<th>Support</th>
<th>Water</th>
<th>Notes, Samples, Tests</th>
<th>Material</th>
<th>Classification Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td>SILT: low plasticity, dark brown</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Clayey SILT: low plasticity, grey, medium gravel sized charcoal fragments</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Silty CLAY: medium to high plasticity, grey mottled orange</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SILTSTONE: grey with orange staining</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Very Slow Progress in Weathered Rock</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Test pit CTP16 terminated at 1.6m</td>
<td></td>
</tr>
</tbody>
</table>

### Sketch

**Sketch:**

- **Method:** N (natural exposure), X (existing excavation), BH (backhoe bucket), B (bulldozer blade), R (ripper), E (excavator)
- **Support:** S (shoring), N (nil)
- **Penetration:** 1-3.5 mm (no resistance ranging to refusal)
- **Water:** 
  - Water level: on date shown
  - Water inflow
  - Water outflow
- **Notes, Samples, Tests:**
  - Undisturbed Sample: U<sub>d</sub>
  - Undisturbed Sample: U<sub>e</sub>
  - Disturbed Sample: D
  - Vane Shear (kPa):
  - Vane sample: V
  - Vane sample: V<sub>e</sub>
  - Bulk Sample: B
  - Environmental Sample: E
- **Classification Symbols and Soil Description:**
  - Based on Unified Classification System
  - Moisture:
    - D (dry)
    - M (moist)
    - W (wet)
    - Wp (plastic limit)
    - Wl (liquid limit)
  - Consistency/Density Index:
    - VS (very soft)
    - S (soft)
    - F (firm)
    - St (stiff)
    - VSf (very stiff)
    - H (hard)
    - Fb (brittle)
    - VL (very loose)
    - L (loose)
    - MD (medium dense)
    - D (dense)
    - VD (very dense)
EXCAVATION NO. CTP17

CLIENT: MAUNSELL AECOM
PRINCIPAL: RTA
PROJECT: GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE

TEST PIT LOCATION: REFER SITE PLAN

EQUIPMENT TYPE AND MODEL: BACKHOE 300mm BUCKET
PIT ORIENTATION:

EASTING: 294317.61 m
NORTHING: 6152810.23 m

EXCAVATION DIMENSIONS:
- 3m long
- 0.4m wide

MATERIAL SUBSTANCE:
- TOPSOIL: Silty Clay; low plasticity, brown
- Gravelly CLAY: medium to high plasticity, orange brown and grey mottled, gravel fine to coarse grained, angular to sub-rounded
- Clayey GRAVEL: fine to coarse grained, angular to sub-rounded, medium to high plasticity, orange brown and grey mottled
- Refusal Very Slow Progress on Rock

TEST PIT CTP17 terminated at 1.45m

SKETCH

METHOD
- N: Natural Exposure
- X: Existing Excavation
- BH: Backhoe Bucket
- B: Bulkyizer Blade
- E: Excavator

SUPPORT
- S: Shoring
- N: N-Rail

PENETRATION
- 1: No resistance
- 2: Ranging to refusal

NOTES, SAMPLES, TESTS
- U<sub>50</sub>: Undisturbed Sample 50mm Diameter
- U<sub>63</sub>: Undisturbed Sample 63mm Diameter
- D: Disturbed Sample
- V: Vane Shear (kPa)
- Bs: Bulk Sample
- E: Environmental Sample
- R: Refusal

CONSISTENCY/DENSITY INDEX
- VS: Very Soft
- S: Soft
- D: Stiff
- VSB: Very Stiff
- H: Hard
- F: Fissile
- L: Very Loose
- MD: Medium Dense
- D: Dense
- VD: Very Dense

MOISTURE
- D: Dry
- M: Moist
- W: Wet
- Wp: Plastic Limit
- W<sub>i</sub>: Liquid Limit

CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION
- BASED ON UNIFIED CLASSIFICATION SYSTEM

S: SOIL
F: CLAY
B: SAND
G: Silt

595x842.png

Geotechnics

Sheet 1 of 1
Project No: GEOTUNAN02580-AA
Date started: 19.3.2007
Date completed: 19.3.2007
Logged by: KM
Checked by: 

Form GEO 3.2 Issue 3 Rev 2
Excavation No. CTP18

Sheet 1 of 1
Project No. GEOTUNAN02580-AA

Client: MAUNSELL AECOM
Date started: 19.3.2007
Principal: RTA
Date completed: 19.3.2007
Project: GERRINGONG TO BOMADERY, PRINCES HWY UPGRADE
Logged by: KM
Test pit location: REFER SITE PLAN
Checked by: 

Excavation dimensions:
- 4m long
- 0.4m wide

Datum:
- Northing: 6150528.94 m
- Easting: 295861.61 m
- R.L. Surface: 6.52

Material:
- Soil type: plasticity or particle characteristics, colour, secondary and minor components
- Moisture content:
  - Undisturbed sample 50mm diameter
  - Disturbed sample
- Bulk sample:
  - Water
  - Water level
  - Water inflow
  - Water outflow

Classification symbols and soil description:
- Based on unified classification system
- Moisture:
  - Dry
  - Moist
  - Wet
- Limit:
  - Plastic
  - Liquid
- Classification:
  - VS
  - S
  - Soil
  - Firn
  - Silty
  - Very stiff
  - Hard
  - Fm
  - Loose
  - Medium dense
  - Dense
  - Very dense
### Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN

**Excavation No.** CTP19  
**Sheet:** 1 of 1  
**Project No.:** GEOTUNAN02580-AA  
**Date started:** 23.3.2007  
**Date completed:** 23.3.2007  
**Logged by:** KM  
**Checked by:**

---

**Excavation Information**

<table>
<thead>
<tr>
<th>Method</th>
<th>Support</th>
<th>Notes, Samples, Tests</th>
<th>Classification Symbols</th>
<th>Material</th>
<th>Structure and Additional Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S sining</td>
<td>N nil</td>
<td>TOPSOIL</td>
<td>M</td>
<td>TOPSOIL</td>
</tr>
<tr>
<td>2</td>
<td>backhoe bucket</td>
<td>existing excavation</td>
<td>CLAY: medium plasticity, dark brown, root fibres</td>
<td>VSWH</td>
<td>ALLUVIAL?</td>
</tr>
<tr>
<td>3</td>
<td>Lithocore drill</td>
<td>disturbance</td>
<td>CLAY: high plasticity, grey motled orange/brown, root fibres</td>
<td>VS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ripper</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>excavator</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Excavation Dimensions:** 4m long, 0.7m wide  
**Northings:** 6151782.43m  
**datum:**

---

**Sketch**

Test pit CTP19 terminated at 2.4m

---

**Method**

- N: natural exposure  
- X: existing excavation  
- BH: backhoe bucket  
- L: Lithocore drill  
- E: excavator

**Support**

- S: sining  
- N: nil  
- L: Lithocore drill  
- E: excavator

**Notes, Samples, Tests**

- U1p: undisturbed sample 50mm diameter  
- U1d: undisturbed sample 63mm diameter  
- D: disturbed sample  
- V: vane shear (kPa)  
- B: bulk sample  
- E: environmental sample  
- R: refusal

**Consistency/Density Index**

- VS: very soft  
- S: soft  
- F: firm  
- Dr: stiff  
- VSWH: very stiff  
- H: hard  
- Ph: plastic  
- VL: very loose  
- L: loose  
- MD: medium dense  
- D: dense  
- VD: very dense
## Engineering Log - Excavation

### Client:
**MAUNSELL AECOM**

### Principal:
**RTA**

### Project:
**GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE**

### Test pit location:
**REFER SITE PLAN**

### Equipment type and model:
**BACKHOE 600mm BUCKET**

### Excavation dimensions:
- **5m** long
- **0.7m** wide

### Datum:
- **Easting:** 296691.88 m
- **Northing:** 6153624.54 m
- **R.L. Surface:** 85.68

### Additional observations:
- **Colluvium**

### Sketch

---

**Notes:**
- Inflow at 2.2m
- Very Slow Progress
- Test pit CTP20 terminated at 2.9m
Engineering Log - Excavation

Client: MAUNSELL AECOM
Principal: RTA
Project: GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE
Test pit location: REFER SITE PLAN

Excavation No. CTP21
Sheet 1 of 2
Project No. GEOTUNA02580-AA
Date started: 22.3.2007
Date completed: 22.3.2007
Logged by: KM
Checked by:

equipment type and model: BACKHOE 600mm BUCKET
Pit Orientation:
Easting: 203897.76 m
Northing: 6149367.44 m
datum:

excavation dimensions: 4m long 0.7m wide

material substance

<table>
<thead>
<tr>
<th>material</th>
<th>moisture content (%)</th>
<th>density / compaction index</th>
<th>Penetration resistance (kPa)</th>
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</thead>
<tbody>
<tr>
<td>Clayey SILT: low to medium plasticity, grey</td>
<td>M</td>
<td>ALLUVIAL</td>
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<tr>
<td>CLAY: high plasticity, grey / brown mottled</td>
<td>SVVSI</td>
<td></td>
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<tr>
<td>Colour change: grey and orange brown mottled</td>
<td></td>
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<tr>
<td>Silty CLAY: high plasticity, grey, mottled orange and red</td>
<td>M H</td>
<td></td>
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</tr>
<tr>
<td>RESIDUAL?</td>
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</tbody>
</table>

Sketch

method penetration support notes, samples, tests classification soil type: plasticity or particle characteristics, colour, secondary and minor components.

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<thead>
<tr>
<th>method</th>
<th>penetration</th>
<th>support</th>
<th>notes, samples, tests</th>
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<tbody>
<tr>
<td>N</td>
<td>X</td>
<td>S</td>
<td>Shoring N nil</td>
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<tr>
<td>BH</td>
<td>U</td>
<td>B</td>
<td>bulldozer blade</td>
</tr>
<tr>
<td>R</td>
<td>E</td>
<td>R</td>
<td>Ripper</td>
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classification symbols and soil description

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<td>Uw</td>
<td>undisturbed sample 50mm diameter</td>
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<tr>
<td>Ua</td>
<td>undisturbed sample 30mm diameter</td>
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<tr>
<td>D</td>
<td>disturbed sample</td>
</tr>
<tr>
<td>V</td>
<td>vane shear (kPa)</td>
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<tr>
<td>Bs</td>
<td>bulk sample</td>
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<tr>
<td>E</td>
<td>environmental sample</td>
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<td>R</td>
<td>refusal</td>
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moisture
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<th>D</th>
<th>M</th>
<th>W</th>
<th>Wp</th>
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<tr>
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<tr>
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consistency/density index
<table>
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<tr>
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<tr>
<td>VS</td>
</tr>
<tr>
<td>S</td>
</tr>
<tr>
<td>F</td>
</tr>
<tr>
<td>Sh</td>
</tr>
<tr>
<td>VBS</td>
</tr>
<tr>
<td>H</td>
</tr>
<tr>
<td>FD</td>
</tr>
<tr>
<td>L</td>
</tr>
<tr>
<td>M'</td>
</tr>
<tr>
<td>D</td>
</tr>
<tr>
<td>VD</td>
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**Engineering Log - Excavation**

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN  
**Logged by:** KM  
**Date started:** 22.3.2007  
**Date completed:** 22.3.2007  
**Equipment type and model:** BACKHOE 600mm BUCKET  
**Excavation dimensions:** 4m long, 0.7m wide  
**Easting:** 203807.76 m  
**Northing:** 6149367.44 m  
**RL Surface:** 8.24  
**datum:**

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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>VS: very soft</td>
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<td>S: soft</td>
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<td>F: firm</td>
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<td></td>
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<td>BI: stiff</td>
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<td>VS: very stiff</td>
</tr>
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<td>H: hard</td>
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<td>FB: friable</td>
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<td>VL: very loose</td>
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<td></td>
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<td>VD: very dense</td>
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**Excavation Information**

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<tr>
<td>E</td>
<td></td>
<td>0.0</td>
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**Notes:**  
Test pit CTP21 terminated at 9 m.
Excavation No. CTP22

Client: MAUNSELL AECOM
Principal: RTA
Project: GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE
Test pit location: REFER SITE PLAN

---

**Equipment and Excavation Data**
- **Equipment type and model:** BACKHOE 600mm BUCKET
- **Pit Orientation:**
  - Easting: 298457.89 m
  - Northing: 6152607.64 m
  - Datum: 38.02
- **Excavation dimensions:** 4m long, 0.7m wide

**Material and Soil Description**
- **Material:**
  - **Classification:**
    - FILL: Clayey Gravel: low plasticity, black brown, road and road base.
    - Clayey GRAVEL: medium to high plasticity, grey brown, mottled black red orange, weathered rock
  - **Soil Type:**
    - Plasticity or particle characteristics, colour, secondary and minor components.
- **Support and Classifications:**
  - **Support:**
    - **Notes:**
      - S strong, N nil
      - **Penetration:**
        - BS bulk sample
        - Vs environmental sample
      - **Ripper:**
        - no resistance ranging to refusal
      - **Water:**
        - water level on date shown
      - **Water Inflow:**
        - water inflow
      - **Water Outflow:**
        - water outflow
  - **Classification Symbols and Soil Description:**
    - **System:**
      - Vs very soft
      - S soft
      - F firm
      - Dr stiff
      - VsL very stiff
      - H hard
      - Ph soluble
      - W very loose
      - L very loose
      - MD medium dense
      - D dense
      - VD very dense

---

**Excavation Details**
- **Terminated due to rock, fine grained sandstone**
- **Test pit CTP22 terminated at 0.7m**

---

**Sketch**

---

**Support and Consistency/Density Index**
- **Support:**
  - S strong, N nil
- **Consistency/Density Index:**
  - Vs very soft
  - S soft
  - F firm
  - Dr stiff
  - VsL very stiff
  - H hard
  - Ph soluble
  - W very loose
  - L very loose
  - MD medium dense
  - D dense
  - VD very dense
# Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN

## Excavation Information

<table>
<thead>
<tr>
<th>method</th>
<th>support</th>
<th>notes, samples, tests</th>
<th>material description</th>
<th>moisture condition</th>
<th>consistency/ density index</th>
<th>additional observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>1</td>
<td></td>
<td>Gravelly Silty CLAY: low plasticity, brown, fine to medium gravel, angular to rounded, roots / root fibres</td>
<td>M</td>
<td>VS</td>
<td>TOPSOIL FILL</td>
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<tr>
<td>E</td>
<td>2</td>
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<td>Gravelly CLAY: low plasticity, orangishbrown, fine to medium grained gravel subrounded</td>
<td>V8</td>
<td>X</td>
<td>ALLUVIAL F</td>
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<tr>
<td>E</td>
<td>3</td>
<td></td>
<td>CLAY: medium plasticity, brown orange</td>
<td>V8H</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>3</td>
<td></td>
<td>CLAY: high plasticity, brown orange</td>
<td>X</td>
<td></td>
<td>RESIDUAL</td>
</tr>
<tr>
<td>E</td>
<td>3</td>
<td></td>
<td>CLAY: high plasticity orange/ brown, mottled red/grey/black</td>
<td>H</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Slow Progress  
Test pit CTP23 terminated at 2.2m

---

**Sketch**

---

**Equipment**  
Type and model: BACKHOE 300mm BUCKET  
Pit Orientation: \( 29.6683' \)  
R.I. Surface: 38.94°  
Excavation dimensions: 4m long, 0.4m wide  
Noting: 8153748.01 m  
Datum:  

---

**Legend**

- **N:** Natural exposure  
- **BH:** Backhoe bucket  
- **S:** Showing  
- **N:** Nil  
- **R:** Ripper  
- **E:** Excavator  
- **water level:** Measured on site  
- **water inflow:** Measured on site  
- **water outflow:** Measured on site  
- **VS:** Very Soft  
- **VS:** Very stiff  
- **V:** Very hard  
- **F:** Firm  
- **S:** Soft  
- **MG:** Medium dense  
- **D:** Dense  
- **VL:** Very loose  
- **L:** Loose  
- **M:** Medium dense  
- **D:** Dense  
- **V:** Very dense
Engineering Log - Excavation

Client: MAUNSELL AECOM
Principal: RTA
Project: GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE

Test pit location: REFER SITE PLAN

Excavation No. CTP24
Sheet 1 of 1
Project No. GEOTUNAN02580-AA
Date started: 19.3.2007
Data completed: 19.3.2007
Logged by: KM
Checked by: 

equipment type and model: RACKHOB 300mm BUCKET  Pit Orientation:
excavation dimensions: 3.5m long 0.4m wide
Northing: 6153791.93 m
Easting: 3004440.01 m
R.L. Surface: 30.92
datum: 

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<th>notes, samples, tests</th>
<th>soil type: plasticity or particle characteristics, colour, secondary and minor components.</th>
<th>classification symbol</th>
<th>material</th>
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<tbody>
<tr>
<td>E</td>
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<td>Gravely CLAY: low plasticity, brown, gravel, angular</td>
<td>Gravely CLAY: low plasticity, brown, gravel, angular</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td>CLAY: medium plasticity, brown mottled red, black</td>
<td>CLAY: medium plasticity, brown mottled red, black</td>
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<tr>
<td></td>
<td></td>
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<td></td>
<td>oranges with traces of gravel fine to coarse grained, sub rounded</td>
<td>oranges with traces of gravel fine to coarse grained, sub rounded</td>
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<tr>
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<td></td>
<td>CLAY: high plasticity, grey mottled orange, traces of</td>
<td>CLAY: high plasticity, grey mottled orange, traces of</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>fine to coarse grained gravel, sub rounded</td>
<td>fine to coarse grained gravel, sub rounded</td>
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<tr>
<td></td>
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<td>Gravely CLAY: high plasticity, pale yellow grey</td>
<td>Gravely CLAY: high plasticity, pale yellow grey</td>
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<tr>
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<td></td>
<td></td>
<td>mottled purple, gravel fine to coarse grained, angular</td>
<td>mottled purple, gravel fine to coarse grained, angular</td>
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</tr>
</tbody>
</table>

Very Slow Progress / Refusal on Weathered Rock

Sketch
Test pit CTP24 terminated at 2.4m

method |
-------|
N      | natural exposure |
X      | existing excavation |
BH     | backhoe bucket |
B      | Bullrake blade |
R      | Ripper |
E      | Excavator |

test pit location: REFER SITE PLAN

Notes:
- Support: S - Shoring, N - nil
- Penetration: no resistance ranging to refusal
- Water level: on date shown
- Water inflow
- Water outflow
## Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
**Logged by:** KM  
**Test pit location:** REFER SITE PLAN

### Excavation Information

<table>
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<tr>
<th>method</th>
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<th>notes, samples, tests</th>
<th>material</th>
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<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### Material Description

- **TOPSOIL:** Silty Clay; low plasticity, dark brown, roots, root fibres
- **CLAY:** medium plasticity, dark brown
- **CLAY:** high plasticity, brown mottled and grey mottled

### Observations

- Colour change gradual at 1.2m, grey, orange and red mottled
- Colour change at 2m, pale grey, orange mottled

---

**Sketch**

---

**Legend**

- **N** natural exposure
- **X** existing excavation
- **BH** backhoe bucket
- **D** bulldozer blade
- **E** excavator

- **S** shoring
- **N** nil

- **penetration**
  - 1.5 = no resistance ranging to refusal

- **water**
  - **water level** on date shown
  - **water inflow**
  - **water outflow**

- **classification symbols and soil description**
  - **moisture**
    - D: dry
    - M: moist
    - W: wet
  - **plastic limit**
    - Wp
  - **liquid limit**
    - W

- **consistency/density index**
  - VS: very soft
  - S: soft
  - F: firm
  - D: stiff
  - S: stiff
  - VS: very stiff
  - H: hard
  - F: firm
  - VL: very loose
  - L: loose
  - MD: medium dense
  - D: dense
  - VD: very dense
### Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN  
**Excavation No.:** CTP25  
**Sheet:** 2 of 2  
**Project No.:** GEOUTUNAN02580-AA  
**Date started:** 21.3.2007  
**Date completed:** 21.3.2007  
**Logged by:** KM  
**Checked by:** Y

#### Excavation Information
- **Equipment type and model:** BACKHOE 600mm BUCKET  
- **Pit Orientation:**  
  - **Easting:** 284387.3 m  
  - **Northing:** 6147220.56 m  
  - **Datum:** 51.37  
- **Excavation dimensions:** 3.5m long, 0.7m wide

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**Test pit CTP25 terminated at 2.7m**

### Sketch

---

#### Notes, Samples, Tests
- **U<sub>ts</sub>:** undisturbed sample 50mm diameter  
- **U<sub>ds</sub>:** undisturbed sample 63mm diameter  
- **D:** disturbed sample  
- **V:** vane shear (kPa)  
- **Bs:** bulk sample  
- **E:** environmental sample  
- **R:** refusal

### Classification Symbols and Soil Description
- **Moisture:** D dry  
- **moist:** M  
- **Wet:** W  
- **Wp:** plastic limit  
- **Wl:** liquid limit

### Consistency/Density Index
- **VS:** very soft  
- **S:** soft  
- **F:** firm  
- **Stiff:** Stiff  
- **VSf:** very stiff  
- **H:** hard  
- **FH:** friable  
- **VL:** very loose  
- **L:** loose  
- **MD:** medium dense  
- **D:** dense  
- **VD:** very dense
## Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERY, PRINCES HWY UPGRADE

**Test pit location:** REFER SITE PLAN  
**Logged by:** KM  
**Checked by:**

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<td>datum:</td>
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</tr>
</tbody>
</table>

### Excavation Information

<table>
<thead>
<tr>
<th>method</th>
<th>support</th>
<th>notes, samples, tests, etc</th>
<th>water level</th>
<th>water inflow</th>
<th>water outflow</th>
<th>penetration</th>
<th>soil type: plasticity or particle characteristics, colour, secondary and minor components.</th>
<th>moisture content</th>
<th>consistency/density index</th>
<th>soil erodibility</th>
<th>soil structure</th>
<th>soil strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>natural exposure</td>
<td>N nil</td>
<td></td>
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<td></td>
<td></td>
<td>TOPSOIL: Silty Clay; low plasticity, black/brown</td>
<td>M</td>
<td>F/Si</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BH</td>
<td>backhoe bucket</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CLAY: high plasticity, brown and orange mottled</td>
<td></td>
<td>VS1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>bulldozer blade</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CLAY: high plasticity, blue grey and orange mottled</td>
<td></td>
<td>H</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>excavator</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### Additional Observations

- ALLUVIAL
- VSI
- H

**Sketch**

---

**Excavation No:** CTP26  
**Sheet:** 1 of 2  
**Project No:** GEOTUNAN02580-AA  
**Date started:** 20.3.2007  
**Date completed:** 20.3.2007
### Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN

**Excavation No.:** CTP26  
**Sheet:** 2 of 2  
**Project No.:** GEOTUNAN02580-AA  
**Date started:** 20.3.2007  
**Date completed:** 20.3.2007  
**Logged by:** KM  
**Checked by:**

#### Excavation Information

<table>
<thead>
<tr>
<th>penetration method</th>
<th>notes, samples, tests</th>
<th>material</th>
<th>soil type: plasticity or particle characteristics, colour, secondary and minor components.</th>
<th>moisture condition</th>
<th>classification symbol</th>
<th>notation for additional observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td>CLAY: high plasticity, blue grey and orange mottled (continued)</td>
<td>M</td>
<td>H</td>
<td>ALLUVIAL</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **excavation dimensions:** 4m long, 0.7m wide
- **Northing:** 6145335.47
- **datum:**
- **Structure and additional observations:**
  - Tool pit CTP26 terminated at 2.0m.

#### Sketch

**Notes, Samples, Tests: L, U<sub>n</sub>, U<sub>d</sub>, V, E, B, R**
- **water level:** on date shown
- **water inflow:**
- **water outflow:**

**Support System:**
- S (shoring)  
- N (nil)

**Penetration:**
- BH (backhoe bucket)
- R (ripper)
- E (excavator)

**Consistency/Density Index:**
- VS: very soft
- S: soft
- F: firm
- St: stiff
- VSt: very stiff
- H: hard
- Ph: very loose
- VL: very loose
- L: loose
- MD: medium dense
- D: dense
- VD: very dense

**Soil Description:**
- based on unified classification system

**Classification Symbols:**
- S: soft
- F: firm
- St: stiff
- VSt: very stiff
- H: hard
- Ph: very loose
- VL: very loose
- L: loose
- MD: medium dense
- D: dense
- VD: very dense
## Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN

---

**Excavation No.: CTP27**  
**Sheet:** 1 of 1  
**Project No.:** GEOTUNAN02580-AA  
**Date started:** 21.3.2007  
**Date completed:** 21.3.2007  
**Logged by:** KM  
**Checked by:**

---

### Excavation Information

<table>
<thead>
<tr>
<th>Method</th>
<th>Support</th>
<th>Notes, Samples, Tests</th>
<th>Classification Symbol</th>
<th>Material Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td>TOPSOIL: Silty Clay; low plasticity, dark brown, roots and root fibres</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td>Silty CLAY: medium plasticity, dark orange brown</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td>COBBLES: Fine to coarse grained cobbles, surrounded, brown with fines to coarse grained gravel, boulders up to 400mm in diameter</td>
</tr>
</tbody>
</table>

Terminated due to refusal on rock shelf  
Test pit CTP27 terminated at 1.7m

---

### Sketch

---

### Classification Symbols and Soil Description

- **Soil Description:** Based on unified classification system
- **Moisture:**
  - D: Dry  
  - M: Moist  
  - W: Wet
- **Wp:** Plastic limit  
  - W: Liquid limit
- **Consistency/Density Index:**
  - VS: Very soft  
  - S: Soft  
  - F: Firm  
  - St: Stiff  
  - VS: Very stiff  
  - H: Hard  
  - Fc: Frangible  
  - V: Very loose  
  - L: Loose  
  - MD: Medium dense  
  - D: Dense  
  - VD: Very dense
## Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN

| equipment type and model: | BACKHOE 600mm BUCKET  
| excavation dimensions: | 4m long, 0.7m wide  
| Easting: | 287100.36 m  
| Northing: | 6148863.56 m  
| Datum: | 33.02

### Excavation Information

<table>
<thead>
<tr>
<th>Method</th>
<th>Support</th>
<th>Notes, Samples, Tests</th>
<th>Material</th>
<th>Moisture Condition</th>
<th>Consistency/Density Index</th>
<th>Structure and Additional Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td></td>
<td></td>
<td>TOPSOIL: Clay: low plasticity, dark brown, roots, root fibres</td>
<td>M</td>
<td>P/St</td>
<td>RESIDUAL? COLLUVIUM?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CLAY: medium to high plasticity, dark brown, red brown</td>
<td>M</td>
<td>V/St</td>
<td>RESIDUAL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CLAY: high plasticity, dark red brown</td>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Colour change, dark red orange and grey/brown mottled</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Colour change, orange/red and grey mottled</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sketch:** Test pit CTP28 terminated at 2.5m

**Notes:**
- **method:** 1. natural exposure, 2. existing excavation, 3. ripper, 4. excavator
- **support:** S = shoring, N = nil
- **notes, samples, tests:** Uds = undisturbed sample 50mm diameter, Ud = disturbed sample
- **classification symbols and soil description:** based on unified classification system
- **consistency/density index:** VS = very soft, S = soft, F = firm, St = stiff, VSt = very stiff, H = hard, Fb = friable, L = loose, Md = medium dense, D = dense, VD = very dense
**Engineering Log - Excavation**

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERRY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN

---

### Excavation Information

<table>
<thead>
<tr>
<th>method</th>
<th>support</th>
<th>notes, samples, tests</th>
<th>material</th>
<th>moisture condition</th>
<th>structure and additional observations</th>
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<tr>
<td></td>
<td></td>
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<td>TOPSOIL</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>ST</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>VST X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D VD</td>
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</tbody>
</table>

### Sketch

- Vary Slow Progress on Rock
- Test pit CTP29 terminated at 2m

---

### Soil Type

- **TOPSOIL:** Silty Clay: low plasticity, dark brown
- **CLAY:** medium plasticity, grey / brown
- **CLAY:** high plasticity, orange / brown, grey and red mottled
- **GRAVEL:** fine to coarse grained, angular, grey, brown, weathered staining

### Moisture Condition

- **ST:** stiff
- **VST:** very stiff
- **H:** hard

### Water Level

- **water level on date shown**
- **water inflow and outflow**

---

**Method**

- **N:** natural exposure
- **X:** existing excavation
- **BH:** backhoe bucket
- **B:** bulldozer blade
- **R:** ripper
- **E:** excavator

---

**Date started:** 22.3.2007  
**Date completed:** 22.3.2007  
**Logged by:** KM  
**Checked by:**
## Engineering Log - Excavation

### Equipment and Model
- Equipment type and model: Backhoe 600mm Bucket
- Pit Orientation: Easting: 301030.3 m, R.L. Surface: 2.54
- Excavation dimensions: 4m long, 0.7m wide

### Excavation Information

<table>
<thead>
<tr>
<th>Method</th>
<th>Support</th>
<th>Water</th>
<th>Notes, Samples, Tests</th>
<th>Material</th>
<th>Classification</th>
<th>Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components.</th>
<th>Moisture Condition</th>
<th>Consistency/Density Index</th>
<th>Classification Symbols and Soil Description</th>
<th>Notes, Samples, Tests</th>
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<tbody>
<tr>
<td>E</td>
<td></td>
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<td></td>
<td>TOPSOIL</td>
<td></td>
<td>Clay: low plasticity, black/brown</td>
<td>P/Silt</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CLAY:</td>
<td></td>
<td>High plasticity, black/brown</td>
<td>P/Silt</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CLAY:</td>
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<td>High plasticity, black/brown, mottled orange, red</td>
<td>P</td>
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<td></td>
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<td></td>
<td>Silt CLAY:</td>
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<td>Medium plasticity, orange/black/red, mottled, medium gravel siezed charcol fragments</td>
<td>P</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Sketch

- Natural Exposure: Existing Excavation
- Backhoe Bucket
- Backhoe Excavator
- Bentonite: Bentonite
- Ripper
- Water Level: Water level on data shown
- Water Inflow: Water inflow
- Water Outflow: Water outflow

### Notes
- Soil type: Plasticity or particle characteristics, colour, secondary and minor components.
- Moisture condition: P/Silt, P
- Consistency/density index: Very soft, soft, firm, stiff, very stiff, hard, friable, very loose, loose, medium dense, dense, very dense

### Additional Observations
- TOPSOIL
- ALLUVIAL
- ALLUVIAL
## Engineering Log - Excavation

**Client:** MAUNSELL AECOM  
**Principal:** RTA  
**Project:** GERRINGONG TO BOMADERY, PRINCES HWY UPGRADE  
**Test pit location:** REFER SITE PLAN

### Excavation Information

<table>
<thead>
<tr>
<th>Method</th>
<th>Support</th>
<th>Notes, Samples, Tests</th>
<th>Classification</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>N</td>
<td>Silling</td>
<td>N nil</td>
<td>Soil type: plasticity or particle characteristics, colour, secondary and minor components.</td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>existing excavation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>BH</td>
<td>backhoe bucket</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>bulldozer blade</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>ripper</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>excavator</td>
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<td></td>
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</tbody>
</table>

- **Notes:** Silling, N nil, Soil type: plasticity or particle characteristics, colour, secondary and minor components.

### Material Substance

<table>
<thead>
<tr>
<th>Soil Type</th>
<th>Plasticity</th>
<th>Colour</th>
<th>Secondary</th>
<th>Minor Components</th>
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</thead>
<tbody>
<tr>
<td>Silty clay</td>
<td>Low</td>
<td>Grey</td>
<td>White</td>
<td>Shells</td>
</tr>
</tbody>
</table>

### Additional Observations

- **Test pit CTP30 terminated at 3.1m**

---

**Sketch**

**Legend:**
- **N** natural exposure
- **X** existing excavation
- **BH** backhoe bucket
- **B** bulldozer blade
- **R** ripper
- **E** excavator
- **W** water level
- **W** water inflow
- **W** water outflow

**Consistency/Density Index:**
- **VS** very soft
- **S** soft
- **F** firm
- **St** stiff
- **VSf** very stiff
- **H** hard
- **Ps** friable
- **VL** very loose
- **L** loose
- **MD** medium dense
- **D** dense
- **VD** very dense