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# BOREHOLE ENGINEERING LOG

BOREHOLE NO.

**BH12B**

SHEET 1 OF 4

| | | | |
|---|---|---|---|
| Client: | QUEENSLAND DEPARTNENT OF MAIN ROADS | Date Commenced: | 23/1/02 |
| Project: | TUGUN BYPASS GEOTECHNICAL INVESTIGATION | Date Completed: | 25/1/02 |
| Borehole Location: | TUGUN | Recorded By: | MCM |
| Project Number: | 2134070A | Log Checked By: | DAW |

| | | | | | |
|---|---|---|---|---|---|
| Drill Model/Mounting: | | Hole Angle: | 90° | Surface RL: | 3.94 m AHD |
| Borehole Diameter: | 120 mm | Bearing: | --- | Co-ords: | E 49694 N 87738 PMG |

| Borehole Information | | | | | | Field Material Description | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| METHOD | SUPPORT | WATER | RL(m) AHD / DEPTH(m) | FIELD TEST | SAMPLE | GRAPHIC LOG | USC SYMBOL | SOIL/ROCK MATERIAL FIELD DESCRIPTION | MOISTURE | RELATIVE DENSITY / CONSISTENCY (VS FB, S F, F VL, ST L, VST MD, H D, VH VD) | HAND PENETROMETER (kPa) | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| WB | Nil | | 3 / 1 | 6,6,8 N=14 | SPT | | SP | **SAND:** fine to medium grained, pale grey to white, with a trace of silt. | W | | | ESTUARINE/ FLOODPLAIN/TIDAL DELTA DEPOSITS |
| | | | 3.00 / -3 | 10,17,20 N=37 | SPT | | SM | **Cemented Silty SAND (Coffee Rock):** fine to medium grained, grey-brown to dark grey. | M | | | |
| | | | 0 / 4 | | | | | | | | | |
| | | | -1 / 5 | 10,20,25 N=45 | SPT | | | ... becomes mottled pale and dark brown from 4.5m to 4.95m. | | | | |
| | | | | | | | | ... colour grading to a uniform brown to dark brown. | | | | |
| | | | -2 / 6 | 9,16,20 N=36 | SPT | | | | | | | |
| | | | -3 / 7 | | | | | | | | | |
| | | | -4 / 8 | 6,11,14 N=25 | SPT | | | | | | | |
| | | | -5 / 9 | R | SPT | | | ... colour grades into dark brown. | | | | N=R |
| | | | -6 / 10 | | | | | ... slight colour variations and drilling penetration changes indicate presence of bedding. | | | | |
| | | | -7 / 11.00 | 32,32,33 N=65 | SPT | | | ... minor bioturbation. | | | | |
| | | | | | | | SP | **SAND:** fine to medium grained, yellow-brown. | | | | |
| | | | -8 / 12 | 8,11,8 N=19 | SPT | | | | | | | |
| | | | -9 / 13 | | | | | | | | | |
| | | | -10 / 14 | 10,17,18 N=35 | SPT | | | | | | | |

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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# BOREHOLE ENGINEERING LOG

BOREHOLE NO.

**BH12B**

SHEET 2 OF 4

| | | | |
|---|---|---|---|
| Client: | QUEENSLAND DEPARTNENT OF MAIN ROADS | Date Commenced: | 23/1/02 |
| Project: | TUGUN BYPASS GEOTECHNICAL INVESTIGATION | Date Completed: | 25/1/02 |
| Borehole Location: | TUGUN | Recorded By: | MCM |
| Project Number: | 2134070A | Log Checked By: | JAW |

Drill Model/Mounting:
Borehole Diameter: 120 mm
Hole Angle: 90°
Bearing: ---
Surface RL: 3.94 m AHD
Co-ords: E 49694 N 87738 PMG

| Borehole Information | | | | | | Field Material Description | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| METHOD | SUPPORT | WATER | RL(m) AHD / DEPTH(m) | FIELD TEST | SAMPLE | GRAPHIC LOG | USC SYMBOL | SOIL/ROCK MATERIAL FIELD DESCRIPTION | MOISTURE | RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H; FB VL L MD D VD) | HAND PENETROMETER (kPa) | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| WB | | | 15.00 / 12 / 16 | 8,15,21 N=36 | SPT | | SP | **SAND**: fine to medium grained, greenish grey, trace of clay. | M | | | |
| | | | 13 / 17 | 11,18,25 N=43 | SPT | | | | | | | |
| | | | 14 / 18 | 9,13,24 N=37 | SPT | | | ... becoming dark grey. | | | | |
| | | | 15 / 19 | | | | | | | | | |
| | | | 16 / 20.00 20 | R | SPT | | SM | **Cemented Silty SAND (Coffee Rock)**:fine to medium grained, brown to dark brown, uniform grading, rounded, parallel laminations (0-5°) visible. | | | | N=R |
| | | | 17 / 21 | | | | | | | | | |
| | | | 18 / 22 | R | SPT | | | | | | | N=R |
| | | | 19 / 23 | 10,15,15 N=30 | SPT | | | | | | | |
| | | | 20 / 24.00 24 | | | | SP | **SAND**: fine to medium grained, grey to dark grey, trace of clay. | | | | |
| | | | 21 / 25 | 6,10,9 N=19 | SPT | | | | | | | |
| | | | 22 / 26 | 15,18,28 N=46 | SPT | | | | | | | |
| | | | 25.50 / 23 / 27 | | | | ML | **Clayey SILT**: dark grey. | | | | |
| | | | 24 / 28 | 0 | SPT | | | | | | | |
| | | | 25 / 29 | | U50 | | | | | | | |

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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# BOREHOLE ENGINEERING LOG

BOREHOLE NO.

**BH12B**

SHEET 3 OF 4

| | | | |
|---|---|---|---|
| Client: | QUEENSLAND DEPARTNENT OF MAIN ROADS | Date Commenced: | 23/1/02 |
| Project: | TUGUN BYPASS GEOTECHNICAL INVESTIGATION | Date Completed: | 25/1/02 |
| Borehole Location: | TUGUN | Recorded By: | MCM |
| Project Number: | 2134070A | Log Checked By: | CRW |

| | | | | | |
|---|---|---|---|---|---|
| Drill Model/Mounting: | | Hole Angle: | 90° | Surface RL: | 3.94 m AHD |
| Borehole Diameter: | 120 mm | Bearing: | --- | Co-ords: | E 49694 N 87738 PMG |

| Borehole Information | | | | | | Field Material Description | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| METHOD | SUPPORT | WATER | RL(m) AHD / DEPTH(m) | FIELD TEST | SAMPLE | GRAPHIC LOG | USC SYMBOL | SOIL/ROCK MATERIAL FIELD DESCRIPTION | MOISTURE | RELATIVE DENSITY / CONSISTENCY (VS FB, S VL, F L, ST MD, VST D, H VD) | HAND PENETROMETER (kPa) | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| WB | | | -27 / 31 | | U50 | | SC | **Clayey SAND:** grey. | M | | | |
| | | | -28 / 32 | | | | | | | | | |
| | | | -29 / 33 | | | | | | | | | |
| | | | -30 / 34.00 / 34 | 0 | SPT | | CH | **Silty CLAY:** grey with pale brown mottling, with a trace of sand, contains root/wood fragments. | | | | RESIDUAL SOIL |
| | | | -31 / 35 | | | | | | | | | |
| | | | -32 / 36.00 / 36 | | U50 | | SC | **Clayey SAND:** grey, pale red and yellow. | | | | |
| | | | 36.50 | | | | | **ARGILLITE:** clayey, grey with orange, yellow and red mottling, highly to moderately weathered, very low strength interbedded with **GREYWACKE:** fine grained, pale grey, highly weathered, very low strength. | | | | WEATHERED ROCK |
| | | | -33 / 37 | | | | | | | | | |
| | | | -34 / 38 | | | | | REFER TO CORED BOREHOLE LOG | | | | |
| | | | -35 / 39 | | | | | | | | | |
| | | | -36 / 40 | | | | | | | | | |
| | | | -37 / 41 | | | | | | | | | |
| | | | -38 / 42 | | | | | | | | | |
| | | | -39 / 43 | | | | | | | | | |
| | | | -40 / 44 | | | | | | | | | |

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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# CORED BOREHOLE ENGINEERING LOG

BOREHOLE NO.

**BH12B**

SHEET 4 OF 4

| | | | |
|---|---|---|---|
| Client: | QUEENSLAND DEPARTNENT OF MAIN ROADS | Date Commenced: | 23/1/02 |
| Project: | TUGUN BYPASS GEOTECHNICAL INVESTIGATION | Date Completed: | 25/1/02 |
| Borehole Location: | TUGUN | Recorded By: | MCM |
| Project Number: | 2134070A | Log Checked By: | DAW |

| | | | | | |
|---|---|---|---|---|---|
| Drill Model/Mounting: | | Hole Angle: | 90° | Surface RL: | 3.94 m AHD |
| Borehole Diameter: | 120 mm | Bearing: | --- | Co-ords: | E 49694 N 87738 PMG |

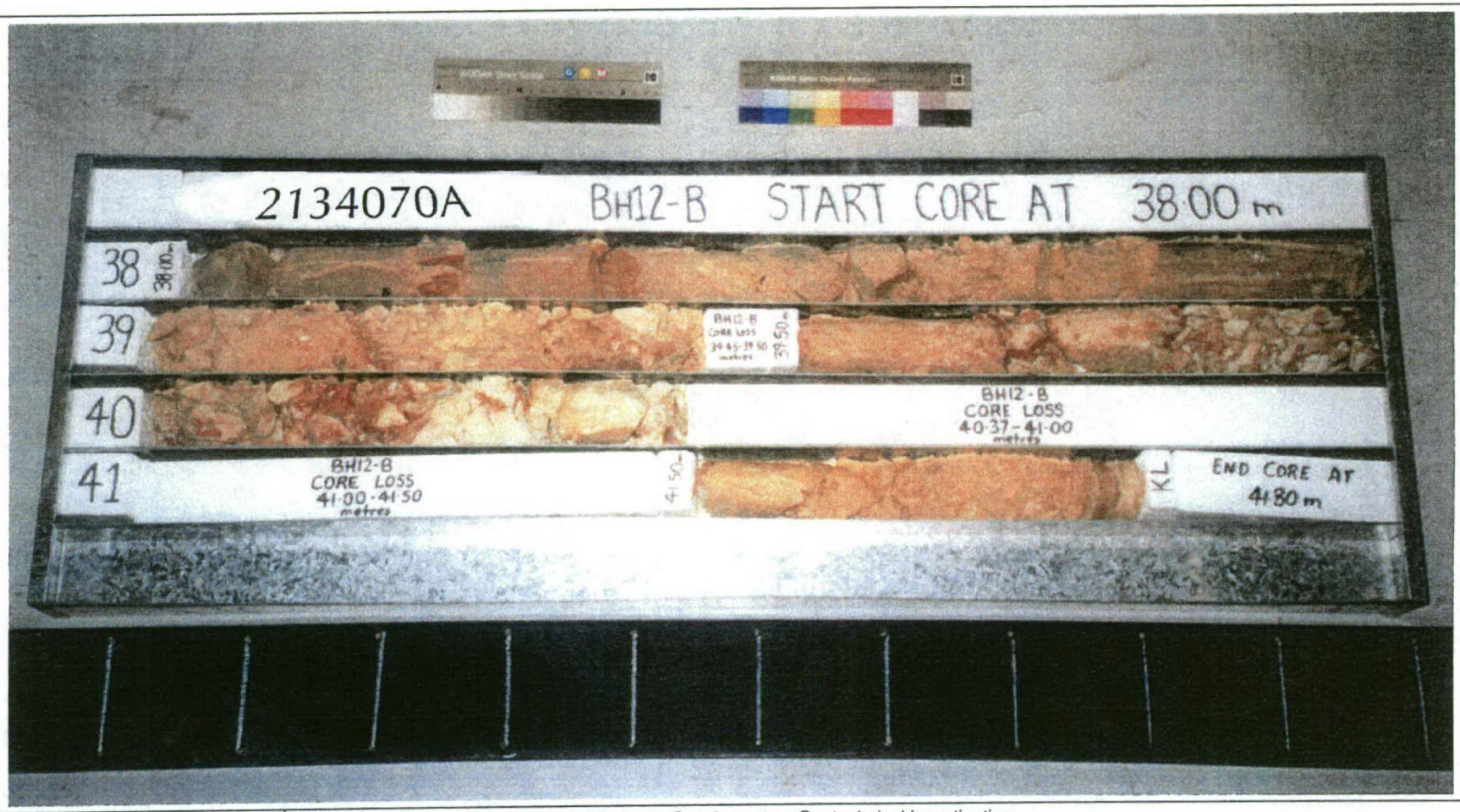
**Borehole Information** | **Field Material Description**

| 1 | 2 | 3 | 4 | 5 | 6 | | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| METHOD | SUPPORT | WATER | CORE RECOVERY | RQD | RL(m) AHD | DEPTH(m) | GRAPHIC LOG | SOIL/ROCK MATERIAL FIELD DESCRIPTION | WEATHERING | INFERRED STRENGTH Is(50) MPa: EL 0.03, VL 0.1, L 0.3, M 1, H 3, VH 10, EH | AVERAGE DEFECT SPACING mm: 10, 30, 100, 300, 1000, 3000 | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| | | | | | 27 | 31 | | | | | | |
| | | | | | 28 | 32 | | | | | | |
| | | | | | 29 | 33 | | | | | | |
| | | | | | 30 | 34 | | | | | | |
| | | | | | 31 | 35 | | | | | | |
| | | | | | 32 | 36 | | | | | | |
| | | | | | 33 | 37 | | | | | | |
| | | | | | 34 | 38 | | COMMENCE CORING AT 38 m | | | | |
| NMLC | Nil | | 97 | 16 | 35 | 39 | | **ARGILLITE**: fine grained, pale grey to brown with orange, yellow and red staining, highly weathered, very low strength, granular, friable. | HW | | | WEATHERED ROCK<br>Joint typically 25°, 45°, planar, iron stained. |
| | | | | | | 39.43 | | | | | | |
| | | | | | | 39.50 | | CORE LOSS | | | | |
| | | | 44 | 8 | 36 | 40 | | **ARGILLITE**: fine grained, pale grey to brown with orange, yellow and red staining, highly weathered, very low strength, granular, friable. | HW | | | |
| | | | | | | 40.37 | | CORE LOSS | | | | |
| | | | | | 37 | 41 | | | | | | |
| | | | 93 | 0 | | 41.50 | | **ARGILLITE**: fine grained, pale grey to brown with orange, yellow and red staining, highly weathered, very low strength, granular, friable. | HW | | | |
| WB | | | | | | 41.80 | | WASH BORED | | | | |
| | | | | | 38 | 42 | | END OF BOREHOLE AT 42.00 m | | | | |
| | | | | | 39 | 43 | | | | | | |
| | | | | | 40 | 44 | | | | | | |

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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PB PARSONS BRINCKERHOFF

| | |
|---|---|
| **Project** | : Tugun Bypass Project – Supplementary Geotechnical Investigation |
| **Job Number** | : 2134070A |
| **Location** | : Borehole 12 - B |
| **Depth** | : 38.00 – 41.80 m |
| **Date Drilled** | : 23 – 25 January 2002 |