Queensland Government
Department of Main Roads

# ENGINEERING BOREHOLE LOG

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/3-2005

BOREHOLE No BHP78
SHEET 1 of 3
REFERENCE No H9914

PROJECT HOUGHTON HIGHWAY BRIDGE DUPLICATION - HOUGHTON HIGHWAY UPGRADE PROJECT
LOCATION 24m RIGHT,0.7m STH FROM EASTN PILE OF PIER 78 OF EXIST BRIDGE COORDINATES 39791.5 E; 53863.8 N
PROJECT No FG5423 SURFACE R.L. -1.13 PLUNGE DATE STARTED 02/06/06 GRID DATUM PROJECT DATUM
JOB No 165/122/35 HEIGHT DATUM AHD BEARING DATE COMPLETED 02/06/06 DRILLER CAIRNS DRILLING

| DEPTH (m) | R.L. (m) | CASING / WASH BORING / CORE DRILLING | RQD ( )% CORE REC % | SAMPLE | MATERIAL DESCRIPTION | LITHOLOGY | USC | WEATHERING | INTACT STRENGTH (EH VH H M L VL EL) | DEFECT SPACING (mm) (20 60 200 600 2000) | GRAPHIC LOG | ADDITIONAL DATA AND TEST RESULTS | SAMPLES / TESTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | -1.13 | | | | **ESTUARINE SILTY SAND**<br>Dark grey, wet, very loose to loose.<br><br>Some partly decomposed shell fragments; mainly fine grained sand; slightly organic throughout. | | | | | | | | |
| 1 | | | | A | | | | | | | | $pH_F$ = 7.80<br>$pH_{FOX}$ = 6.38 | 1,1,1<br>N=2 SPT |
| 2 | | | | | | | (SM) | | | | | | |
| 3 | | | | B | | | | | | | | $pH_F$ = 7.96<br>$pH_{FOX}$ = 6.05 | RW<br>N<1 SPT |
| 4 | | | | | | | | | | | | Silty clay layer | |
| 5 | | | | C | | | | | | | | $pH_F$ = 8.15<br>$pH_{FOX}$ = 6.55 | 1,1,-<br>N=1 SPT |
| | -6.63 | | | | **ESTUARINE SAND AND SHELL**<br>Dark grey, wet, medium dense. | | | | | | | | |
| 6 | | | | D | | | (SP-SM) | | | | | $pH_F$ = 8.02<br>$pH_{FOX}$ = 6.55 | 2,5,7<br>N=12 SPT |
| | -8.13 | | | | **ESTUARINE SILTY CLAY**<br>Dark grey, moist, very soft. | | | | | | | | |
| 7 | | | | E | High plasticity; high organic content; minor fraction of decomposed shell fragments. | | | | | | | $pH_F$ = 8.11<br>$pH_{FOX}$ = 6.26 | RW<br>N<1 SPT |
| 8 | | | | | | | (OH) | | | | | | |
| 9 | | | | F | | | | | | | | $pH_F$ = 8.30<br>$pH_{FOX}$ = 6.61 | RW<br>N<1 SPT |
| 10 | -11.13 | | | | | | | | | | | | |

A_ENGINEERING BOREHOLE LOG W LITHOLOGY FG5423 HIGHWAY BRIDGE.GPJ MRD_LIB_V1.2.GLB 25/10/06

REMARKS

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Queensland Government
Department of Main Roads

# ENGINEERING BOREHOLE LOG

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/3-2005

BOREHOLE No BHP78
SHEET 2 of 3
REFERENCE No H9914

PROJECT HOUGHTON HIGHWAY BRIDGE DUPLICATION - HOUGHTON HIGHWAY UPGRADE PROJECT
LOCATION 24m RIGHT,0.7m STH FROM EASTN PILE OF PIER 78 OF EXIST BRIDGE COORDINATES 39791.5 E; 53863.8 N
PROJECT No FG5423 SURFACE R.L. -1.13 PLUNGE DATE STARTED 02/06/06 GRID DATUM PROJECT DATUM
JOB No 165/122/35 HEIGHT DATUM AHD BEARING DATE COMPLETED 02/06/06 DRILLER CAIRNS DRILLING

| DEPTH (m) | R.L. (m) | CASING / WASH BORING / CORE DRILLING | RQD ( )% CORE REC % | SAMPLE | MATERIAL DESCRIPTION | LITHOLOGY | USC | WEATHERING | INTACT STRENGTH (EH VH H M L VL EL) | DEFECT SPACING (mm) (20 60 200 600 2000) | GRAPHIC LOG | ADDITIONAL DATA AND TEST RESULTS | SAMPLES / TESTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | -11.13 | | | | **ESTUARINE SILTY CLAY**<br>(As above.) | | | | | | | | |
| | | | | G | | | (OH) | | | | | $pH_F$ = 8.03<br>$pH_{FOX}$ = 6.38<br>RW<br>N<1 | SPT |
| 11 | -12.63 | | | | **ESTUARINE SILTY SAND**<br>Dark grey, wet, mainly very loose. | | | | | | | | |
| 12 | | | | H | Some shell fragments below 16.0m. | | | | | | | $pH_F$ = 7.48<br>$pH_{FOX}$ = 6.18<br>RW<br>N<1 | SPT |
| 13 | | | | J | | | | | | | | $pH_F$ = 8.52<br>$pH_{FOX}$ = 5.81<br>HW<br>N<1 | SPT |
| 14 | | | | | | | (SM) | | | | | | |
| 15 | | | | K | | | | | | | | $pH_F$ = 7.95<br>$pH_{FOX}$ = 5.70<br>1,-,-<br>N<1 | SPT |
| 16 | | | | | | | | | | | | | |
| | | | | L | | | | | | | | $pH_F$ = 7.91<br>$pH_{FOX}$ = 6.54<br>1,1,1<br>N=2 | SPT |
| 17 | -18.63 | | | | **ESTUARINE CLAYEY GRAVEL**<br>Dark grey, mainly wet, medium dense. | | | | | | | | |
| 18 | | | | M | Some shell fragments; subangular quartz particles sizing up to 25mm. | | (GC) | | | | | $pH_F$ = 7.63<br>$pH_{FOX}$ = 4.25<br>6,6,6<br>N=12 | SPT |
| 19 | -20.13 | | | | **ALLUVIAL SANDY GRAVEL**<br>Grey brown to pale grey brown, wet, medium dense. | | | | | | | | |
| | | | | N | | | (GP) | | | | | 4,5,6<br>N=11 | SPT |
| 20 | -21.13 | | | | | | | | | | | | |

REMARKS

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A_ENGINEERING BOREHOLE LOG W LITHOLOGY FG5423 HIGHWAY BRIDGE.GPJ MRD_LIB_V1.2.GLB 25/10/06

Queensland Government
Department of Main Roads

# ENGINEERING BOREHOLE LOG

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/3-2005

BOREHOLE No BHP78
SHEET 3 of 3
REFERENCE No H9914

PROJECT HOUGHTON HIGHWAY BRIDGE DUPLICATION - HOUGHTON HIGHWAY UPGRADE PROJECT
LOCATION 24m RIGHT,0.7m STH FROM EASTN PILE OF PIER 78 OF EXIST BRIDGE COORDINATES 39791.5 E; 53863.8 N
PROJECT No FG5423 SURFACE R.L. -1.13 PLUNGE DATE STARTED 02/06/06 GRID DATUM PROJECT DATUM
JOB No 165/122/35 HEIGHT DATUM AHD BEARING DATE COMPLETED 02/06/06 DRILLER CAIRNS DRILLING

| DEPTH (m) | R.L. (m) | CASING / WASH BORING / CORE DRILLING | RQD ( )% CORE REC % | SAMPLE | MATERIAL DESCRIPTION | LITHOLOGY | USC | WEATHERING | INTACT STRENGTH (EH VH H M L VL EL) | DEFECT SPACING (mm) (20 60 200 600 2000) | GRAPHIC LOG | ADDITIONAL DATA AND TEST RESULTS | SAMPLES | TESTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | -21.13 | | | | **ALLUVIAL SANDY GRAVEL**<br>(As above.)<br><br>(Coarse fraction > Fine fraction)<br><br>Coarse fraction - Angular to subangular quartzo particles sizing up to 50mm.<br><br>Fine fraction - Angular to subangular medium to coarse grained sand with minor silt fraction. | | (GP) | | | | | 8,7,6<br>N=13 | | SPT |
| 21 | | | | P | | | | | | | | High water loss | | |
| 22 | | | | | | | | | | | | | | |
| 23 | | | | Q | | | | | | | | 8,8,9<br>N=17 | | SPT |
| 24 | | | | | | | | | | | | | | |
| | -25.63 | | | | **ALLUVIAL CLAY**<br>Dark grey, moist, firm.<br>(Driller's record only.) | | (OL) | | | | | $pH_F$ = 6.53<br>$pH_{FOX}$ = 1.64 | | |
| 25 | -26.13 | | | | **SANDSTONE**<br>**FINE GRAINED MAINLY MASSIVE POORLY CEMENTED SEDIMENTARY ROCK**<br>**HW**?: (Driller's record only.) | | HW | | | | | | | |
| | -26.83 | | (97) | | **SW**: Pale grey to white, mainly massive, fine grained, medium to mainly high strength.<br><br>Occasional discontinuous carbonaceous laminations / pods with thickness varying up to 20mm.<br><br>Defects: Generally rare.<br>- Occasional drilling induced lamination partings <10° (1/m). | | SW | | | | | Some siltstone rip-up clasts. | Is(50)=1.45 MPa<br>Is(50)=1.58 MPa<br>Is(50)=2.26 MPa<br>Is(50)=1.60 MPa<br>Is(50)=0.43 MPa<br>Is(50)=0.32 MPa | x<br>o<br>o<br>x<br>x<br>o |
| 26 | | | | | | | | | | | | | | |
| 27 | -28.46 | | | | **MUDSTONE**<br>**FINE GRAINED THINLY LAMINATED SEDIMENTARY ROCK**<br>**SW**: Dark grey to black, thinly laminated, fine grained, mainly medium to high strength.<br>Some sandstone laminations.<br>Defects: Generally rare.<br>- Occasional drilling induced lamination partings (1-2/m).<br>- Occasional weathered and altered bands <100 mm. | | SW | | | | | HW and altered clay infilled band. | Is(50)=0.84 MPa<br>Is(50)=1.04 MPa<br>Is(50)=0.80 MPa<br>Is(50)=0.73 MPa<br>Is(50)=0.83 MPa<br>Is(50)=0.76 MPa | x<br>o<br>x<br>o<br>x<br>o |
| 28 | -29.83 | | 100 | | Borehole terminated at 28.7m | | | | | | | | | |
| 29 | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | |

REMARKS

LOGGED BY
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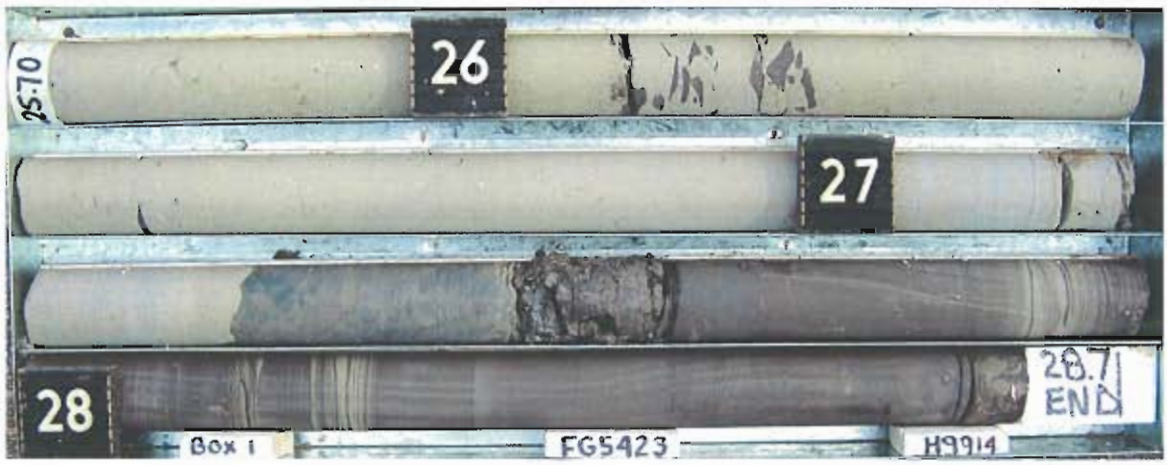
A_ENGINEERING BOREHOLE LOG W LITHOLOGY FG5423 HIGHWAY BRIDGE.GPJ MRD_LIB_V1.2.GLB 25/10/06

Project: **Houghton Highway Bridge Duplication**

Borehole No: **BHP78**

Start Depth: 25.70m
Finish Depth: 28.70m
Project No: FG5423
H No: 9914




0 100 200 300 400 500 600mm

SCALE 1:5

Queensland Government
Department of Main Roads

ROAD SYSTEM & ENGINEERING
GEOTECHNICAL BRANCH
35 Butterfield St
Herston Q 4006

# Point Load Strength Index - Test Report

**Project: Houghton Highway Bridgesite Investigation**
**Project No: FG5423**

**Date Sampled 02/06/06** **Date Tested 15/06/06**
**Feature: N/A**
**Sample Type: NMLC Core**

**Report No. FG5423/GS06-489/AS4133.4.1**

| Sample Number | Sample Location | Depth (m) | Test Type D,A,B,I* | Is (MPa) | Is50 (MPa) | Strength Descriptor** | Lithology |
|---|---|---|---|---|---|---|---|
| GS06/489.A | BHP 78 | 25.77 | D | 1.46 | 1.45 | H | Sandstone |
| GS06/489.B | BHP 78 | 25.79 | A | 1.58 | 1.58 | H | Sandstone |
| GS06/489.C | BHP 78 | 26.30 | A | 2.17 | 2.26 | H | Sandstone |
| GS06/489.D | BHP 78 | 26.40 | D | 1.61 | 1.60 | H | Sandstone |
| GS06/489.E | BHP 78 | 27.09 | D | 0.43 | 0.43 | M | Sandstone |
| GS06/489.F | BHP 78 | 27.11 | A | 0.32 | 0.32 | M | Sandstone |
| GS06/489.G | BHP 78 | 27.50 | D | 0.85 | 0.84 | M | Mudstone |
| GS06/489.H | BHP 78 | 27.64 | A | 1.09 | 1.04 | H | Mudstone |
| GS06/489.J | BHP 78 | 28.06 | D | 0.81 | 0.80 | M | Mudstone |
| GS06/489.K | BHP 78 | 28.08 | A | 0.74 | 0.73 | M | Mudstone |

Sample Remarks

* D - Diametral; A - Axial; B - Block; I - Irregular; ** EL - Extremely Low; VL - Very Low; L - Low; M - Medium; H - High; VH - Very High; EH - Extremely High ( taken from AS1726 Table 8A )

Remarks / Variations to Test Procedures:

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Test Method: AS4133.4.1
Software Version 2.03 April 2005

Client Name: Department of Main Roads
Client Address: PO Box 70, Spring Hill QLD 4004

Signatory ..... 19/6/06
( P.REYNOLDS )

Queensland Government
Department of Main Roads

ROAD SYSTEM & ENGINEERING
GEOTECHNICAL BRANCH
35 Butterfield St
Herston Q 4006

# Point Load Strength Index - Test Report

**Project: Houghton Highway Bridgesite Investigation**
**Project No: FG5423**

**Date Sampled 02/06/06** **Date Tested 15/06/06**
**Feature: N/A**
**Sample Type: NMLC Core**

**Report No. FG5423/GS06-489/AS4133.4.1**

| Sample Number | Sample Location | Depth (m) | Test Type D,A,B,I* | Is (MPa) | Is50 (MPa) | Strength Descriptor** | Lithology |
|---|---|---|---|---|---|---|---|
| GS06/489.L | BHP 78 | 28.53 | D | 0.87 | 0.83 | M | Mudstone |
| GS06/489.M | BHP 78 | 28.55 | A | 0.80 | 0.76 | M | Mudstone |

Sample Remarks

* D - Diametral; A - Axial; B - Block; I - Irregular; ** EL - Extremely Low; VL - Very Low; L - Low; M - Medium; H - High; VH - Very High; EH - Extremely High ( taken from AS1726 Table 8A )

Remarks / Variations to Test Procedures:
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Test Method: AS4133.4.1
Software Version 2.03 April 2005

Client Name: Department of Main Roads
Client Address: PO Box 70, Spring Hill QLD 4004

Signatory ..... 17/6/06

( P.REYNOLDS )

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