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### ENGINEERING BOREHOLE LOG

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

BOREHOLE No	BHP43
SHEET	_ <u>1</u> _ of _ <u>3</u> _
REFERENCE No	H9909

grained sand, frequent parity decomposed shell fragments throughout, occasional sitly clay seams.  Becoming more sitly with depth.  ESTUARIE SILTY CLAY  Dark grey, moist, soft to mainly wet, very soft.  High organic content and high plasticity; slighly sandy and shelly at some places.  (CH)  Different F.4.3 Herston of the plant		JECT ATION				BHWAY BRIDGE DUPLICATION - HOUGHT IM EASTN PILE OF PIER 43 OF EXIST BRID						9379.0 E; 52997.2 N	. <b></b> .
ROD													
MATERIAL DESCRIPTION  DESCRIPTION  STUARINE SILTY CLAY Both of the main planticity. slightly lateritic and concreted zones.  ALLUVIAL SILTY CLAY Grey grean to modified orange brownized, most, silf to very silf.  E Madlum to high plasticity, slightly lateritic and concreted zones.  ALLUVIAL SILTY CLAY Grey grean to modified orange brownized, most, silf to very silf.  E Madlum to high plasticity, slightly lateritic and concreted zones.  ALLUVIAL SILTY CLAY Grey grean to modified orange brownized, most, silf to very silf.  E Madlum to high plasticity, slightly lateritic and concreted zones.  ALLUVIAL SILTY CLAY Grey grean to modified orange brownized, most, silf to very silf.  E Madlum to high plasticity, slightly lateritic and concreted zones.	)B I	No 	_165/	122/35_		HEIGHT DATUM <u>AHD</u> BEARING			DATE COMPLETED _	18/05	<u>5/06</u> DRIL	LER <u>CAIRNS DRI</u>	<u>LLIN</u> 0
SIUARINE SILTY CLAY   Dark grey, moist, very soft to soft.   (Childre's record only.)	DEP In (III)	(m)	등장꾼	( )%	APLE		HOLOGY	ATHERING	STRENGTH SPACING (mm)		م	ND	IPLES
Dark gray, moist, very soft to soft.  (Criller's record only.)  ESTUARINE SILTY SAND  Dark gray, well, very loose to loose.  A Sightly organic throughout, fine to medium grained sand, frequent parkly decomposed shell fragments throughout occasional silty claboratory clay seams.  Becoming more silty with depth.  ESTUARINE SILTY CLAY  Dark grey, moist, soft to mainly wet, very soft.  High organic content and high plasticity; slightly sandy and shelly at some places.  DH; = 8.26  DH; = 8.25  DH; = 8.25  DH; = 8.35  DH; = 8.35  DH; = 8.73  ASS Sands slowed at a priv, = 6.73  Geotechnical Laboratory  ASS Sands slowed at Dr; = 6.73  Celectrical Laboratory  DARK grey moist, soft organic content and high plasticity; slightly sandy and shelly at some places.  DH; = 8.25  DH; = 8.25  DH; = 8.25  DH; = 8.25  DH; = 8.35  DH; = 8.35  DH; = 8.43  D	5	-1.66	ŠŠŠ.		SA.		Ė	SS &	┬┼┌┐╷╎ <u>┐╷</u> ╨२┸≊¬⊰┉ 88888	98	16811	RESULIS	SAN
ESTUARINE SILTY SAND  Dark gray, well, very loose to loose.  A Sighty organic throughout; fine to medium grained sand; frequent partly decomposed shell fragments throughout; occasional silty lay seams.  Becoming more sity with depth.  ESTUARINE SILTY CLAY  Dark gray, moist, soft to mainly wet, very soft.  High organic content and high plasticity; slighty sandy and shelly at some places.  C   ALLUVIAL SILTY CLAY  Grey green to motified organge brown/red, moist, stiff to very stiff.  Medium to high plasticity, slightly lateritic and concreted zones.  ALLUVIAL SILTY CLAY  Grey green to motified organge brown/red, moist, stiff to very stiff.  Medium to high plasticity, slightly lateritic and concreted zones.							***************************************	(OH)	‡				
ESTUARINE SILTY CLAY   Composed to lose to los lose to lose		-2.41	М			(Driller's record only.)			Ŧ				
Slightly organic throughout, fine to medium grained sand, frequent partly decomposed shell fragments throughout, occasional silty clay seams.  Becoming more silty with depth.  ESTUARINE SILTY CLAY Dark grey, moist, soft to mainly wet, very soft.  High organic content and high plasticity; slightly sandy and shelly at some places.  CC  ALLUVIAL SILTY CLAY Grey green to motited orange brown/red, moist, stiff to very sulff.  Medium to high plasticity; slightly lateritic and concreted zones.  CCI- CCI- CCI- CCI- CCI- CCI- CCI- CC									<del>-</del>		† <del>-</del> · · · · · · · · · · · · ·	N=2	
ESTUARINE SILTY CLAY Dark grey, moist, soft to mainly wet, very soft.  High organic content and high plasticity; slightly sandy and shelly at some places.  Co  ALLUVIAL SILTY CLAY Grey green to mottled orange brown/red, moist, stiff to very stiff.  Medium to high plasticity; slightly lateritic and concreted zones.  Co  Co  ALLUVIAL SILTY CLAY Grey green to mottled orange brown/red, moist, stiff to very stiff.  Medium to high plasticity; slightly lateritic and concreted zones.  Co  Co  Co  Co  Co  Co  Co  Co  Co  C					А	grained sand; frequent partly decomposed shell fragments throughout; occasional silty		(SM)	† † † †			stored at Herston Geotechnical	5
BSTUARINE SILTY CLAY Bargery, moist, soft to mainly wet, very soft.  Bighty sandy and shelly at some places.  Co  Display and shelly at some places.  ASS Sample stored at places.  Display and shelly at some places.  Co  Display and shelly at some places.  ASS Sample stored at places.  ASS Sample stored at places.  ASS Sample stored at places.  Display and shelly at some places.  ASS Sample stored at places.  ASS Sample stored at places.  Display and shelly at some places.  ASS Sample stored at places.  ASS Sample stored at places.  Display and shelly at some places.  ASS Sample stored at places.  ASS Sample stored at places.  Display and shell stored at places.  Display and shelly at some places.  ASS Sample stored at places.  ASS Sample stored a		-3.91				Becoming more silty with depth.			士				
Laboratory  RW ASS Sample pH <sub>res</sub> = 6.73 shored at therston decembers and pH <sub>res</sub> = 4.38 shored at therston decembers and pH <sub>res</sub> = 4.38 shored at the shored at pH <sub>res</sub> = 4.38 shored at the shored at pH <sub>res</sub> = 4.38 shored at the shored at the shored at pH <sub>res</sub> = 4.38 shored at the shored at the shored at pH <sub>res</sub> = 4.38 shored at the shored at pH <sub>res</sub> = 7.57 shored at the shor					В	Dark grey, moist, soft to mainly wet, very soft.  High organic content and high plasticity;				<b></b> -		N<1 ASS Sample stored at Herston	47
ALLUVIAL SILTY CLAY Grey green to mottled orange brown/red, moist, stiff to very stiff.  E Medium to high plasticity; slightly lateritic and concreted zones.  (Cl-CH)  ALLUVIAL SILTY CLAY Grey green to mottled orange brown/red, moist, stiff to very stiff.  ASS Sample stored at ASS Sample phi-rex = 7.94 stored at ASS Sample					C	-					$pH_F = 8.03$ $pH_{Fox} = 6.73$	RW N<1 ASS Sample stored at Herston Geotechnical	
ALLUVIAL SILTY CLAY  Grey green to mottled orange brown/red, moist, stiff to very stiff.  Medium to high plasticity; slightly lateritic and concreted zones.  (CI-CH)  -11.66					D			(OH)			pH <sub>F</sub> = 7.82 pH <sub>Fox</sub> = 4.38	N<1 ASS Sample stored at Herston Geotechnical	
W.E.		-9.66			Е	Grey green to mottled orange brown/red, moist, stiff to very stiff.  Medium to high plasticity; slightly lateritic		(CI- CH)			pH <sub>F</sub> = 7.94 pH <sub>Fox</sub> = 7.57	N=11 ASS Sample stored at Herston Geotechnical	8
	,	-11.66							Ţ				<u>_</u>



A\_ENGINEERING BOREHOLE LOG W LITHOLOGY FG5423 HIGHWAY BRIDGE.GPJ MRD\_LIB\_V1.2.GLB 25/10/06

### ENGINEERING BOREHOLE LOG

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

BOREHOLE No \_\_BHP43\_\_

SHEET \_\_2\_ of \_\_3\_\_

REFERENCE No \_\_H9909\_\_\_

PRO.	ECT	HQU	IGHTON	<u>H</u> IQ	SHWAY BRIDGE DUPLICATION - HOUGHT	ои н	<u>IGH</u>	WAY UPGRADE PE	<u> SOJE</u>	DI			
.OC/	NOITA	24m	RIGHT	F <u>R</u> C	<u>IM EASTN PILE OF PIER 43 OF EXIST BRID</u>	OGE_			CC	ORDINATE	S 39379.0 E; 52	997.2 N	
PRO.	JECT N	• <u>FG</u> 5	<u>423</u>		SURFACE R.L1,66 PLUNGE			DATE STARTED	18/05	<u>6/06</u> GF	RID DATUM _PRO	JE <u>CT DA</u>	TUM
JOB	No	<u> 165/</u>	122/35		HEIGHT DATUMAHD BEARING			DATE COMPLETED	18/05	6/06	DRILLER CAIR	NS DRIL	LING
DEPTH (m)	R.L. (m)	CASING WASH BORING CORE DRILLING	RQD ()% CORE REC%	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USC	INTACT DEFECT SPACING (mm)	GRAPHIC LOG		DDITIONAL DATA AND TEST RESULTS		SAMPLES TESTS
10 -	-11.6	1	REC 76	"	ALLUVIAL SILTY CLAY		<u> ۱</u> ۲	+	+				σ ⊢
12	-16.16			'F	(As above.)  Becoming clayey sand with depth.		(CI- CH)	<del>*** **** **** **** **** **** **** ***</del>				5,8,12 N=20	SPT
-	-10.10			G	ALLUVIAL CLAYEY SAND			<del>-</del>	<del> </del>	<b>-</b>		7,10,12	SPT
-15 16 17 18				н	Pale green grey to mottled orange brown, moist, medium dense.  Fine to medium grained sand.		(SC)					7,10,12 N=22 5,8,11 N=19	SPT
-	-21.16				ALLUVIAL SAND & GRAVEL			<u></u>	┧				-
	24.00				(Refer next page.)		(GP- GM)	‡					_
20 RE	-21.66 MARKS		<u> </u>			ואאו				l	LOGG	ED BV	
, , ,	***** W W	<del>_</del>									BW / A		



### ENGINEERING BOREHOLE LOG

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

BOREHOLE No	BHP43
SHEET	_3_ of _3_
REFERENCE No	H9909

	ATION JECT No	24m FG54	RIGHT 423	FRC	SHWAY BRIDGE DUPLICATION - HOUGHTOM  M EASTN PILE OF PIER 43 OF EXIST BRID  SURFACE R.L1.66 PLUNGE  HEIGHT DATUMAHD BEARING	GE_		DATE STARTED	CC 18/05	OORDINATE	S 39379.0 E; 52997.2 M SID DATUM PROJECT D DRILLER CAIRNS DR	ATUM_
DEPTH (m)	R.L. (m)	CASING WASH BORING CORE DRILLING	RQD ()% CORE REC%	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USC	INTACT DEFECT SPACING (mm)	GRAPHIC LOG		ODITIONAL DATA AND FEST RESULTS	SAMPLES
-21				J	ALLUVIAL SAND & GRAVEL Grey white to orange brown, wet, medium dense to dense.  Coarse fraction - Subangular to subrounded quartz and sandstone particles sizing up to 50mm.  Fine fraction - Angular to subangular medium to coarse grained quartzo sand.			*			9,15,15 N=30	
23	-26,76			К	-		(GP- GM)				13,13,16 N=29	
	-27.71		(88)	L	SANDSTONE FINE TO MAINLY MEDIUM GRAINED SLIGHTLY LAMINATED TO MAINLY MASSIVE, POORLY CEMENTED SEDIMENTARY ROCK HW: Grey to dark grey, mainly dry, very	,4N	нw				20,10/10 N>5(	SPI
27			(66)		dense silty sand abruptly grading into very low to low strength rock.  SW: Pale grey to grey white, mainly massive, fine to medium grained, mainly medium strength rock becoming high strength with depth.  Some erodable bands in the upper area; occasional mudstone rip up clasts.  Defects: Generally rare.		sw				Is(50)=0.23 MPa Is(50)=0.14 MPa Is(50)=0.34 MPa Is(50)=0.33 MPa Is(50)=0.52 MPa Is(50)=0.59 MPa	X O
28 29 29 29 29 29 29 29 29 29 29 29 29 29	-30.66		100	X	Some drilling-induced lamination partings <20° (1-2/m).     Drilling-induced breaks @ 70° (1/3m).  Borehole terminated at 29m					Core left the borel		
1 30	EMARKS										LOGGED BY BW / ADISS	

Project: Houghton Highway Bridge Duplication

Borehole No: BHP43
Start Depth: 26.00m
Finish Depth: 29.00m
Project No: FG5423
H No: 9909





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

# Point Load Strength Index - Test Report

Project: Houghton Highway Bridge Investigation

Project No: FG5423

Date Sampled 17/05/06

Feature: N/A

Sample Type: NMLC Core

Report No. FG5423/GS06-425/AS4133.4.1

Date Tested 06/06/06

Sample	Sample	Depth	Test Type	ls (145)	ls50	Strength	Lithology
Number	Location	(m)	D,A,B,1*	(MPa)	(MPa)	Descriptor	^ ^
GS06/425.A	BHP 43	26.10	D	0.23	0.23	ı	Sandstone
G300/423.F4	DHF 43	20.10	U	0.23	0.23	L	Sandstone
GS06/425.B	BHP 43	26.13	Α	0.14	0.14	L	Sandstone
GS06/425.C	BHP 43	26.60	D	0.35	0.34	M	Sandstone
GS06/425.D	BHP 43	26.68	Α	0.35	0.33	M	Sandstone
GS06/425.E	BHP 43	27.42	D	0.52	0.52	M	Sandstone
GS06/425.F	BHP 43	27.44	Α	0.64	0.59	М	Sandstone
GS06/425.G	BHP 43	27.85	D	0.66	0.66	M	Sandstone
GS06/425.H	BHP 43	27.90	Α	0.76	0.74	M	Sandstone
GS06/425.J	BHP 43	28.18	D	0.96	0.96	M	Sandstone
GS06/425.K	BHP 43	28.20	Α	0.90	0.90	M	Sandstone

Sample Remarks

\* D - Diametral; A - Axial; 8 - Block; I - Irregular;

\*\* EL - Extremely Low; VL - Very Low; L - Low; M - Medium; H - High; VH - Very High; EH - Extremely High ( laken from AS1726 Table 8A )

Remarks / Variations to Test Procedures:

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

( MR P. REYNOLDS )

Accredite dfor compliance with ISOMEC 17025

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

## Point Load Strength Index - Test Report

Project: Houghton Highway Bridge Investigation

Project No: FG5423

Date Sampled 17/05/06

Feature: N/A

Sample Type: NMLC Core

Report No. FG5423/GS06-425/AS4133.4.1

Date Tested 06/06/06

			1				
Sample Number	Sample Location	Depth (m)	Test Type D,A,B,I*	ls (MPa)	Is50 (MPa)	Strength Descriptor	Lithology
GS06/425.L	BHP 43	28.32	D	1.18	1.16	Н	Sandstone
GS06/425.M	BHP 43	28.35	Α	1.02	1.02	Н	Sandstone
GS06/425.N	BHP 43	28.68	D	0.95	0.95	M	Sandstone
GS06/425.P	BHP 43	28.73	Α	0.93	0.86	M	Sandstone

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 ( laken from AS1726 Table 8A )

Remarks / Variations to Test Procedures:

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

(MR P. REYNOLDS)

Accreditation Number: 2302 Accredited for compliance with ISO/IEC 17025

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