

COPYRIGHT NOTICE

This geotechnical log and its associated data (the Document) is licensed by the Queensland Department of Transport and Main Roads under the [Creative Commons Attribution 4.0 Licence](#) (CC BY 4.0). When reusing the Document, in whole or in part, please attribute the Department and author as follows: "*(c) State of Queensland (Department of Transport and Main Roads) 2020, licensed under the CC BY 4.0 Licence, prepared by Jacobs*". This licence does not apply to the Queensland Government logo or trademarks.

LIMITATION OF LIABILITY

The CC BY 4.0 Licence contains a comprehensive Disclaimer of Warranties and Limitation of Liability. In addition, please note that this Document was prepared for Departmental use only. Reuse of the Document by anyone for any other purpose could result in error and/or loss. You should obtain professional advice before making decisions based on the contents of the Document.

When reproducing any part of this Document, you must also reproduce this limitation of liability notice in addition to the italicised attribution statement above.

Retrieved from the Queensland Geotechnical Database <http://ggd.org.au/>

This log has been contributed to the Queensland Geotechnical Database with the permission of Jacobs.



BOREHOLE ENGINEERING LOG

BOREHOLE NO : BH-SKM-24

CLIENT : TMR	POSITION : E: 10525, N: 152794 (56 South East Transit Horizontal Datum)	PAGE : 1 OF 7
PROJECT : GUSBUS	SURFACE ELEVATION : 36.2 (AHD)	DATE DRILLED : 27/8/12 to 27/8/12
JOB NO : QB10312.540	DIP / AZIMUTH : 90°	LOGGED BY : NC
LOCATION : Adjacent to Gateway Mwy (Southbound)	CONTRACTOR : Geodrill	CHECKED BY : DWL

DRILLING				MATERIAL									
PROGRESS	DRILLING & CASING	WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	STRUCTURE & Other Observations
	AS					36.2	0.0			FILL (SILT) (MH): Black and dark grey, high plasticity, trace sand, trace fine sized gravel, organics and rootlets presents.			0.00 - 3.20m FILL
						35.7	0.5		MH		M	S	3.20-3.40m ALLUVIUM
						35.2	1.0		MH	(MH): With coarse sized gravel.			3.40-7.00m RESIDUAL
						34.7	1.5		MH				7.00-14.60m XW ROCK
						34.2	2.0						14.60-TD HW-MW Rock
						33.7	2.5		MH	(MH): Dark grey mottled orange and brown, trace fine sized gravel, trace rootlets and wood.			
						33.2	3.0		SM	SILTY SAND (SM): Dark grey, fine grained sand.	D to M	D	
						32.7	3.5		CI	SANDY CLAY (CI): Pale grey, medium plasticity, fine to coarse grained sand.	M	St	
						32.2	4.0		CI	(CI): Orange grey mottled red.			
						31.7	4.5		SC	CLAYEY SAND (SC): Grey, coarse grained sand, with fine sized, sub-angular, quartz gravel.	M	D	

DRILLING HA Hand Auger RR Rock Rolling AS Auger Screw HQ HQ Coring AD/T Auger Drill TC-bit NQ NQ Coring AD/V Auger Drill V-bit PQ PQ Coring WB Washbore NMLC NMLC Coring DRILLING PENETRATION VE Very Easy F Firm VH Very Hard E Easy H Hard GROUNDWATER SYMBOLS = Water level (static) = Water level (during drilling)				SAMPLES & FIELD TESTS D Disturbed Sample SPT Standard Penetration Test ES Env Soil Sample U Undisturbed Tube Sample EW Env Water Sample W Water Sample HP Hand Penetrometer HV Hand Vane Shear (P: Peak Su R: Residual Su) N SPT blows per 300mm HW SPT penetration by hammer weight RW SPT penetration by rod weight				DENSITY (SPT N-value) VL Very Loose 0 - 4 L Loose 4 - 10 MD Medium Dense 10 - 30 D Dense 30 - 50 VD Very Dense 50 - 100 CO Compact >50/150mm				CONSISTENCY (Su) {N-value} VS Very Soft < 12 kPa {0-2} S Soft 12 - 25 {2-4} F Firm 25 - 50 {4-8} St Stiff 50 - 100 {8-15} VSt Very Stiff 100 - 200 {15-30} H Hard > 200 kPa {>30}			
---	--	--	--	---	--	--	--	---	--	--	--	--	--	--	--



BOREHOLE ENGINEERING LOG

BOREHOLE NO : BH-SKM-24

CLIENT : TMR	POSITION : E: 10525, N: 152794 (56 South East Transit Horizontal Datum)	PAGE : 2 OF 7
PROJECT : GUSBUS	SURFACE ELEVATION : 36.2 (AHD)	DATE DRILLED : 27/8/12 to 27/8/12
JOB NO : QB10312.540	DIP / AZIMUTH : 90°	LOGGED BY : NC
LOCATION : Adjacent to Gateway Mwy (Southbound)	CONTRACTOR : Geodrill	CHECKED BY : DWL

DRILLING				MATERIAL							
DRILLING & CASING	WATER	DRILLING PENETRATION	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	STRUCTURE & Other Observations
				31.2	5.0		SC	CLAYEY SAND (SC): Grey, coarse grained sand, with fine sized, sub-angular, quartz gravel. <i>(continued)</i>			
			5.50m SPT 12, 15, 16 N=31	30.7	5.5		SC	(SC): Fine to coarse, stained orange and red.			
							SC	(SC): Fine to medium, with some thin bands (to 10mm) clay, without orange and red staining.	M	D	
			5.95m	30.2	6.0		SC	(SC): Increased clay content.			
				29.7	6.5		SC				
			7.00m SPT 5, 8, 11 N=19	29.2	7.0		CH	SANDY CLAY (CH): Pale grey, high plasticity, fine grained sand.	D	VSt	
			7.45m	28.7	7.5			CLAYSTONE: Pale grey, with sand lenses (fine grained), extremely weathered, extremely low strength, with orange and red iron staining.			7.00: [Properties of CLAY]
			8.50m SPT 7, 8, 13 N=21	27.7	8.5					VSt	
			8.95m	27.2	9.0						
			10.00m	26.2	10.0						

DRILLING HA Hand Auger RR Rock Rolling AS Auger Screw HQ HQ Coring AD/T Auger Drill TC-bit NQ NQ Coring AD/V Auger Drill V-bit PQ PQ Coring WB Washbore NMLC NMLC Coring DRILLING PENETRATION VE Very Easy F Firm VH Very Hard E Easy H Hard GROUNDWATER SYMBOLS = Water level (static) = Water level (during drilling)			SAMPLES & FIELD TESTS D Disturbed Sample SPT Standard Penetration Test ES Env Soil Sample U Undisturbed Tube Sample EW Env Water Sample W Water Sample HP Hand Penetrometer HV Hand Vane Shear (P: Peak Su R: Residual Su) N SPT blows per 300mm HW SPT penetration by hammer weight RW SPT penetration by rod weight MOISTURE CONDITION D = Dry M = Moist W = Wet			DENSITY (SPT N-value) VL Very Loose 0 - 4 L Loose 4 - 10 MD Medium Dense 10 - 30 D Dense 30 - 50 VD Very Dense 50 - 100 CO Compact >50/150mm		CONSISTENCY (Su) {N-value} VS Very Soft < 12 kPa {0-2} S Soft 12 - 25 {2-4} MD Medium Dense 25 - 50 {4-8} F Firm 50 - 100 {8-15} St Stiff 100 - 200 {15-30} VSt Very Stiff 200 - 300 {30-45} H Hard > 300 kPa {45-60}	
---	--	--	---	--	--	---	--	---	--

BRISBANE_OFFICE_LIBRARY_CURRENT_GLB_Log_BOREHOLE_GUSBUS.GPJ_BH_SKM_24_SOIL_GDW_19/12/2012_07:39

(c) State of Queensland (Department of Transport and Main Roads) 2020, CC BY 4.0. Please note copyright and limitation of liability notices on attached cover page.



BOREHOLE ENGINEERING LOG

BOREHOLE NO : BH-SKM-24

CLIENT : TMR	POSITION : E: 10525, N: 152794 (56 South East Transit Horizontal Datum)	PAGE : 3 OF 7
PROJECT : GUSBUS	SURFACE ELEVATION : 36.2 (AHD)	DATE DRILLED : 27/8/12 to 27/8/12
JOB NO : QB10312.540	DIP / AZIMUTH : 90°	LOGGED BY : NC
LOCATION : Adjacent to Gateway Mwy (Southbound)	CONTRACTOR : Geodrill	CHECKED BY : DWL

DRILLING				MATERIAL								
DRILLING & CASING	WATER	DRILLING PENETRATION	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	STRUCTURE & Other Observations	
			SPT 4, 9, 10 N=19	26.2	10.0			CLAYSTONE: Pale grey, extremely weathered, extremely low strength, with orange and red iron staining.			10.00: [Properties of CLAY]	
			10.45m	25.7	10.5							
			11.50m SPT 9, 16, 22 N=38	24.7	11.5				Purple grey mottled pink and red, some orange iron staining.		VSt	
			11.95m	24.2	12.0							
			13.00m SPT 9, 30/100mm HB N=R 13.25m	23.2	13.0				SANDSTONE: Orange brown, fine to medium grained sand, with medium sized gravel, extremely weathered, extremely low strength.			
			14.50m SPT 10/0mm HB N=R	21.7	14.5							
				21.2	15.0			Continued as Cored Drill Hole				

DRILLING HA Hand Auger RR Rock Rolling AS Auger Screw HQ HQ Coring AD/T Auger Drill TC-bit NQ NQ Coring AD/V Auger Drill V-bit PQ PQ Coring WB Washbore NMLC NMLC Coring DRILLING PENETRATION VE Very Easy F Firm VH Very Hard E Easy H Hard GROUNDWATER SYMBOLS = Water level (static) = Water level (during drilling)			SAMPLES & FIELD TESTS D Disturbed Sample SPT Standard Penetration Test ES Env Soil Sample U Undisturbed Tube Sample EW Env Water Sample W Water Sample HP Hand Penetrometer HV Hand Vane Shear (P: Peak Su R: Residual Su) N SPT blows per 300mm HW SPT penetration by hammer weight RW SPT penetration by rod weight MOISTURE CONDITION D = Dry M = Moist W = Wet			DENSITY (SPT N-value) VL Very Loose 0 - 4 L Loose 4 - 10 MD Medium Dense 10 - 30 D Dense 30 - 50 VD Very Dense 50 - 100 CO Compact >50/150mm		CONSISTENCY (Su) {N-value} VS Very Soft < 12 kPa {0-2} S Soft 12 - 25 {2-4} MD Medium Dense 25 - 50 {4-8} F Firm 50 - 100 {8-15} St Stiff 100 - 200 {15-30} VSt Very Stiff 200 - 300 {30-45} H Hard > 300 kPa {45-60}	
---	--	--	--	--	--	---	--	---	--

BRISBANE_OFFICE_LIBRARY_CURRENT_GLB Log BOREHOLE GUSBUS.GPJ BH_SKM_24_SOIL_GDW_19/12/2012 07:39



CORED BOREHOLE ENGINEERING LOGBOREHOLE NO : BH-SKM-24

CLIENT : TMR POSITION : E: 10525, N: 152794 (56 South East Transit Horizontal Datum) PAGE : 4 OF 7
 PROJECT : GUSBUS SURFACE ELEVATION : 36.2 (AHD) DATE DRILLED : 27/8/12 to 27/8/12
 JOB NO : QB10312.540 DIP / AZIMUTH : 90° LOGGED BY : NC
 LOCATION : Adjacent to Gateway Mwy (Southbound) CONTRACTOR : Geodrill CHECKED BY : DWL

DRILLING			MATERIAL				DEFECTS & COMMENTS		INSTALLATION DETAIL
DRILLING & WATER DETAIL	TCR/RQD DRILL DEPTH	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH ($I_{s(50)}$)	DEFECT SPACING (mm)	
			25.7—10.5						
			25.2—11.0						
			24.7—11.5						
			24.2—12.0						
			23.7—12.5						
			23.2—13.0						
			22.7—13.5						
			22.2—14.0						
			21.7—14.5						
					START CORING AT 14.60m				
	100% TCR				SANDSTONE: Orange brown, fine to medium grained, with dark red black manganese staining of defects	HW			

BRISBANE_OFFICE_LIBRARY_CURRENT_GLB Log CORED BOREHOLE GUSBUS.GPJ BH_SKM_24_CORE.GDW 19/12/2012 08:00

DRILLING NMLC NMLC Coring HQ HQ Coring NQ NQ Coring PQ PQ Coring TCR % core run recovered RQD % core run > 100mm long (rock fraction only measured) GROUNDWATER SYMBOLS = Water level (static) = Water level (during drilling)	SAMPLES & FIELD TESTS D Disturbed Sample ES Env Soil Sample W Water Sample EW Env Water Sample SPT SPT Sample U Undisturbed Tube Sample PHOTOGRAPHS NOTES <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	DEFECT ABBREVIATIONS CS Crushed Seam CN Clean Cu Curved CZ Crushed Zone CT Coating IR Irregular DB Drill Break SN Stain PR Planar FZ Fractured Zone VR Veneer ST Stepped JT Joint Un Undulated IS Infilled Seam POL Polished SZ Shear Zone RF Rough VN Vein S Smooth SL Slickensided	ROCK STRENGTH (I_{s50} MPa) 0-0.03 Extremely Low 0.03-0.1 Very Low 0.1-0.3 Low 0.3-1.0 Medium 1.0-3.0 High 3.0-10 Very High
--	--	--	---



CORED BOREHOLE ENGINEERING LOGBOREHOLE NO : BH-SKM-24

CLIENT : TMR POSITION : E: 10525, N: 152794 (56 South East Transit Horizontal Datum) PAGE : 5 OF 7
 PROJECT : GUSBUS SURFACE ELEVATION : 36.2 (AHD) DATE DRILLED : 27/8/12 to 27/8/12
 JOB NO : QB10312.540 DIP / AZIMUTH : 90° LOGGED BY : NC
 LOCATION : Adjacent to Gateway Mwy (Southbound) CONTRACTOR : Geodrill CHECKED BY : DWL

DRILLING			MATERIAL			DEFECTS & COMMENTS				
DRILLING & WATER DETAIL	TCR/RQD	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	DESCRIPTION	Weathering	ESTIMATED STRENGTH (Is(50))	DEFECT SPACING (mm)	COMMENTS	INSTALLATION DETAIL
Run 1	100% TCR 100% RQD		17.05 - 17.05m		SANDSTONE: Orange brown, fine to medium grained, with dark red black manganese staining of defects (<i>continued</i>) With grey nodules (up to 10mm)	HW	VL -0.03 L -0.1 M -0.3 H -1 VH -3 EH 10	20 60 200 500 2000	— JT 5° SN PR RF Sample - 15.47m to 15.88m UCS = 21.7 MPa; E = 19.5 GPa	
			19.7 - 16.5		Grey with pale orange and pink flecks	MW			— JT 15° CN PR RF — JT 30° CN CU RF — JT 10° CT CU RF	
			19.2 - 17.0						— JT 55° CT PR S	
			18.7 - 17.5							
			18.2 - 18.0			HW			— JT 10° CN PR RF — JT 35° CN CU S	
Run 2	100% TCR 100% RQD		17.7 - 18.5						— JT 15° CN PR RF	
			17.2 - 19.0							
			16.7 - 19.5		CLAYSTONE: Dark grey to black	EW to HW				
			19.70m		With orange brown iron staining along healed defects					

DRILLING	SAMPLES & FIELD TESTS	DEFECT ABBREVIATIONS	ROCK STRENGTH (Is(50) MPa)
NMLC NMLC Coring NQ NQ Coring TCR % core run recovered RQD % core run > 100mm long (rock fraction only measured) GROUNDWATER SYMBOLS ▼ = Water level (static) ▽ = Water level (during drilling)	D Disturbed Sample W Water Sample SPT SPT Sample U Undisturbed Tube Sample ES Env Soil Sample EW Env Water Sample	CS Crushed Seam CZ Crushed Zone DB Drill Break FZ Fractured Zone JT Joint IS Infilled Seam SZ Shear Zone VN Vein CN Clean CT Coating SN Stain VR Veneer ST Stepped Un Undulated POL Polished RF Rough S Smooth SL Slickensided	0-0.03 Extremely Low 0.03-0.1 Very Low 0.1-0.3 Low 0.3-1.0 Medium 1.0-3.0 High 3.0-10 Very High
	PHOTOGRAPHS NOTES <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		



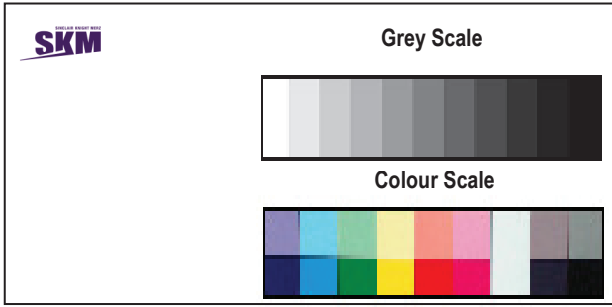
CORED BOREHOLE ENGINEERING LOGBOREHOLE NO : BH-SKM-24

CLIENT : TMR POSITION : E: 10525, N: 152794 (56 South East Transit Horizontal Datum) PAGE : 6 OF 7
 PROJECT : GUSBUS SURFACE ELEVATION : 36.2 (AHD) DATE DRILLED : 27/8/12 to 27/8/12
 JOB NO : QB10312.540 DIP / AZIMUTH : 90° LOGGED BY : NC
 LOCATION : Adjacent to Gateway Mwy (Southbound) CONTRACTOR : Geodrill CHECKED BY : DWL

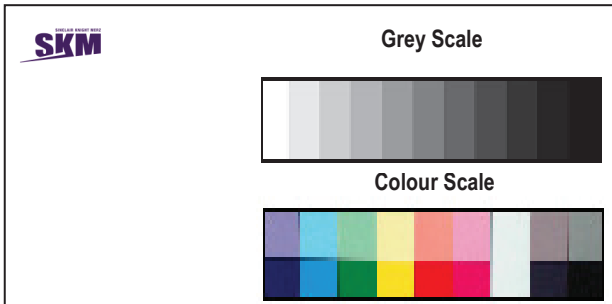
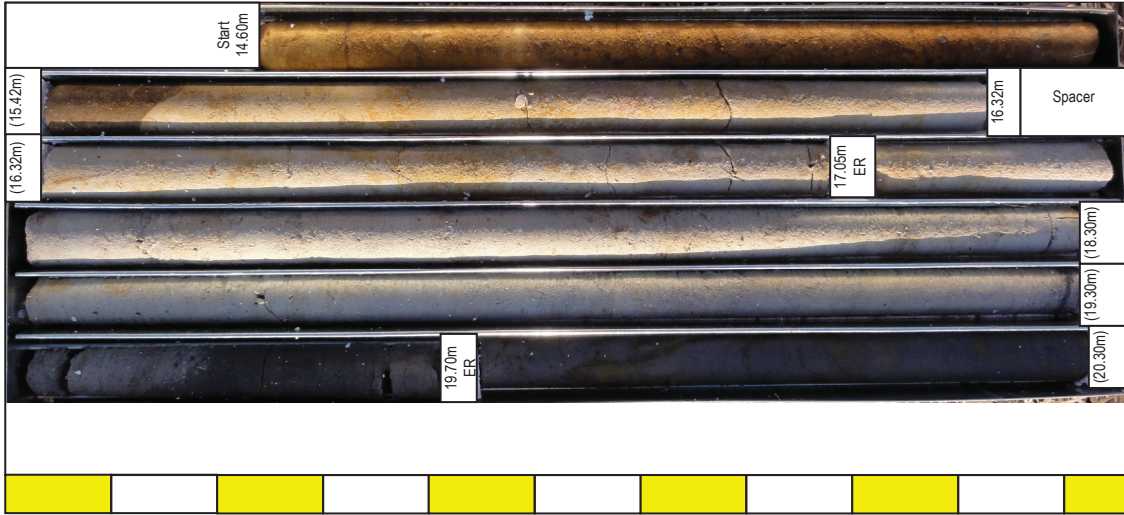
DRILLING			MATERIAL				DEFECTS & COMMENTS		INSTALLATION DETAIL
DRILLING & WATER DETAIL	TCR/RQD	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	DESCRIPTION	Weathering	ESTIMATED STRENGTH (Is(50))	DEFECT SPACING (mm)	
Run 3	100% TCR 100% RQD		15.7-20.5	[Hatched]	CLAYSTONE: Dark grey to black, with orange brown iron staining along heated defects	EW to HW	VL -0.03 L -0.1 M -0.3 H -1 VH -3 EH 10	20-200	
			15.2-21.0	[Hatched]	Grey, with numerous horizontal shrinkage cracks upon drying				— JT 40° CT CU S
			14.7-21.5	[Hatched]					— shrinkage cracks
			14.2-22.0	[Hatched]					
			13.7-22.5	[Dotted]	SANDSTONE: Grey, fine grained, within clay matrix	MW			
			22.70	[Dotted]	CLAY: Grey, (100mm)	EW			— IS Clay (100mm)
			22.70m	[Dotted]	SANDSTONE: Pale grey, fine grained sand within clay matrix	MW			
			13.2-23.0	[Dotted]					
			12.7-23.5	[Hatched]	CLAYSTONE: Brown grey, with some shrinkage cracks	MW			Sample: 23.56m to 24.07m UCS = 1.15 MPa E = 0.1 GPa
			12.2-24.0	[Hatched]					
Run 4	100% TCR 97% RQD		11.7-24.5	[Hatched]					

BRISBANE_OFFICE_LIBRARY_CURRENT_GLB_Log_CORED BOREHOLE_GUSBUS.GPJ_BH_SKM_24_CORE.GDW 19/12/2012 08:00

DRILLING NMLC NMLC Coring HQ HQ Coring NQ NQ Coring PQ PQ Coring TCR % core run recovered RQD % core run > 100mm long (rock fraction only measured) GROUNDWATER SYMBOLS = Water level (static) = Water level (during drilling)	SAMPLES & FIELD TESTS D Disturbed Sample ES Env Soil Sample W Water Sample EW Env Water Sample SPT SPT Sample U Undisturbed Tube Sample PHOTOGRAPHS NOTES <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	DEFECT ABBREVIATIONS CS Crushed Seam CN Clean Cu Curved CZ Crushed Zone CT Coating IR Irregular DB Drill Break SN Stain PR Planar FZ Fractured Zone VR Veneer ST Stepped JT Joint Un Undulated IS Infilled Seam POL Polished SZ Shear Zone RF Rough VN Vein S Smooth SL Slickensided	ROCK STRENGTH (Is(50) MPa) 0-0.03 Extremely Low 0.03-0.1 Very Low 0.1-0.3 Low 0.3-1.0 Medium 1.0-3.0 High 3.0-10 Very High
--	---	---	---



Location		Underpass 1	
Borehole Number		BH-SKM-24	
Box	1	of	2
Depth	14.60m	to	20.30m
Project	GUSBUS		
Number	QB10312.540		
Client	DTMR		



Location		Underpass 1	
Borehole Number		BH-SKM-24	
Box	2	of	2
Depth	20.30m	to	25.60m
Project	GUSBUS		
Number	QB10312.540		
Client	DTMR		

