

# A6 to Manchester Airport Relief Road

B005 – Mill Hill Hollow Bridge Preliminary Design Report Report No. 1007/704/085

September 2013









## PRELIMINARY DESIGN REPORT

<u>Structure Name</u>: Mill Hill Hollow Bridge

<u>Structure Number</u>: B005

Report No. 1007/704/085

# **Report Control Sheet**

Version	Date	Status	Prepared By	Checked By	Approved By
P1	05/01/2012	Draft	N Afshar	N Sheena / T Kshirsagar	N Sheena
2	09/05/2012	Draft (Final)	N Afshar	T Kshirsagar	N Sheena
3	24/01/2013	Draft (Final)	M Mfandarahwa	N Sheena	N Sheena
4	29/08/2013	Draft	L Fields	M Mfandarahwa	N Sheena
5	13/09/2013	Final	L Fields	N Sheena	N Sheena

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### 1. Description of Site

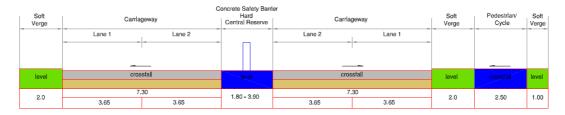
The Mill Hill Hollow Bridge is part of the South East Manchester Multi Modal Strategy (SEMMMS) A6 to Manchester Airport Relief Road (A6MARR) and crosses Norbury Brook approximately 600m North of Poynton Lake at chainage 10300m.

Site location is remote with no direct access from any suitable highway. The nearest road to the proposed structure is Woodford Road located approximately 320m to the Northwest of the farm fields. The alternative access, Macclesfield Road, is approx. 800m north of the proposed structure location. The access would be via the proposed A6MARR route with provision of a temporary bridge structure over Norbury Brook during the construction stage.

There are a few residential houses on Mill Hill Hollow Road to the North of the proposed bridge crossing. The immediate surrounding area is open farm land to the West and to the East. An aerial location plan at 1:1250 scale with the bridge extents delineated in red is included in Appendix A.

### 2. Highway Details

Over Structure – A6MARR with a total width 25.8m as shown in the cross section below:



Under Structure – The bridge spans Norbury brook which will be channelled by new retaining wall structures. The retaining walls are proposed in order to create a footpath at either side of the watercourse.

#### 3. Proposed structure

The proposed structure will be a single span fully integral bridge. The superstructure will be in the form of a pre-cast pre-stressed concrete beams and reinforced concrete slab deck. The bridge superstructure will be supported on full height reinforced concrete abutments on piled foundations. The deck width including stringcourses will be 26.8m.

Footpaths at either side of Norbury Brook are supported by contiguous bored pile walls. A continuation of these walls will be used to support bridge B005A to the east of B005.

A proposed General Arrangement drawing is included in Appendix B.

### 4. Span arrangements

Single span of 18.0m measured between abutment centrelines. The skew angle is approximately 26 degrees. (The square span of the structure is 16.2m)

#### 5. Headroom and Clearances

Norbury Brook is not a navigable watercourse and hence headroom is not critical. A clearance of approximately 7.2m is provided above the footpaths at either side of the watercourse

### 6. Road Restraint system (Bridge Parapets)

Type N2 steel parapet with mesh infill in accordance with Road Restraints Risk Assessment Process (RRRAP) and with TD 19/06. Working width class not to be greater than W4 and will be decided in the final stage of the design. Parapet height is to be 1.4m at the west verge, which contains a cycle route, and 1.0m at the east verge.

Timber post and three rail fencing with pvc mesh infill is to be provided along the retaining walls adjacent to Norbury Brook.

### 7. Preferred Structural Options

### 7.1 Superstructure Options

(Single span, fully integral pre-cast pre-stressed concrete beams and slab deck) refer to Drawing Number 1007/3D/DF7/A6-MA/B005/705:

Fully integral construction is a feasible and considered a cost effective solution. Elimination of movement joints removes a major cause of maintenance problems from penetration of dirt, water and de-icing salts, which corrode substructures. The advantages and disadvantages of using pre-cast concrete beams are given below:

The advantages for using pre-cast concrete beam construction are as follows:

- Low capital & whole-life cost
- Good aesthetics due to symmetrical structure
- Fast and efficient build
- Factory quality with engineered tolerances
- Low maintenance
- Precast beams could be lifted individually
- The beams could be lifted individually
- Permanent formwork provides self supporting system during construction and eliminates false-work
- Reduces site works which is weather dependent

### Disadvantages:

- Precast concrete beams are usually heavier than comparable steel beams. As a result bigger cranes might be required to lift the precast concrete beams.
- Heavier superstructure mentioned above might lead to bigger foundation sizes
- Delivery times are dependent on specialist supplier

### 7.2 Substructure Options

Considering the topography of the site, existing ground level and the feasibility of the work, full height concrete abutment with return wing walls is the best possible option.

Taking the geotechnical information into account, piled foundation would be a suitable foundation method in order to reduce settlements from the embankment and bridge loading, which could affect the track and track bed. Further geotechnical information is addressed in section 8 of this report.

For the contiguous bored pile walls supporting the footpaths 600mm diameter bored piles have been assumed, based on a retained height of 3m. It is envisaged that the walls are constructed prior to the foundations of bridge B005. The length of the piles required would need to be confirmed after a detailed ground investigation has been carried out and the final design undertaken.

### 8. Geotechnical Information

The ground and groundwater conditions for the Mill Hill Hollow Bridge have been assessed using relevant geological maps (Stockport Sheet 98, Solid and Drift Scale 1:50,000) and 8 No. exploratory bore holes logs are provided by a number of phases of GI for the area (refer to Appendix C for further information).

#### 8.1 Groundwater

Groundwater was encountered in two exploratory bore holes, one of which indicated strikes at more than one depth. The overall depths ranged from 2.2mbgl (76.67mAOD) and 6.5mbgl (71.14mAOD). Exploratory bore hole EA\_POYNTON 98\_5 recorded groundwater at 6.5m (71.14mAOD) which rose after 20mins to 1.1mbgl (76.54mAOD), which indicates fast flowing groundwater.

Without any known groundwater monitoring for the site it is important that further investigation/monitoring is carried out in order to assess these groundwater conditions as they could significantly impact on the design and build of the bridge.

### 8.2 Preliminary Geotechnical Assessment

Upon initial assessment, pad foundations founded on full height concrete abutments seemed to provide an appropriate foundation solution for the

B005 - Mill Hill Hollow Bridge Preliminary Design Report

bridge, with consideration needed for de-watering and temporary works such as sheet piles. However, exploratory bore hole EA\_POYNTON 98\_5 identified deep SANDS of up to 15mbgl (62.64mAOD), which could be a possible steep sand channel and therefore due to this feature piled foundations are proposed.

The potential for chemical attack on buried concrete within the ground has not been assessed. This will be the responsibility of the foundation designer.

Given that groundwater has been identified in a number of exploratory bore holes, with some significant changes in level over a short period of time drainage methods will need to be considered in the design. Further investigation into the groundwater levels and changes with seasons, along with flow rates is recommended for the design and drainages methods, along with temporary mitigation measures during construction.

### 9. Environmental Impact Considerations

Refer to Volume 1 (Main Text) of the Environmental Statement.

### 10. Appearance

The proposed superstructure comprises of 0.95m deep pre-cast beams and 0.5m string course with plain concrete finishes spanning across Norbury Brook. In addition, N2 steel parapets (post with 3 rails- open structure) will be mounted on the string courses either sides of the bridge (please refer to the 3D view of the bridge included in Appendix B).

The faces of abutments and wing walls will be a ribbed concrete finish.

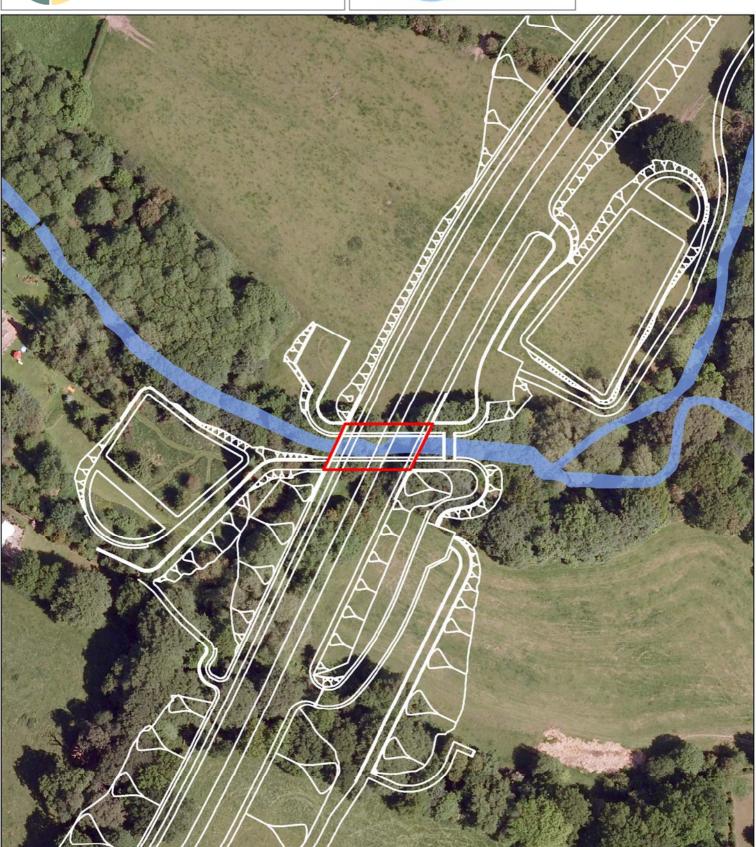
B005 - Mill Hill Hollow Bridge Preliminary Design Report

Stockport Metropolitan Borough Council

Appendix A: Location Plan





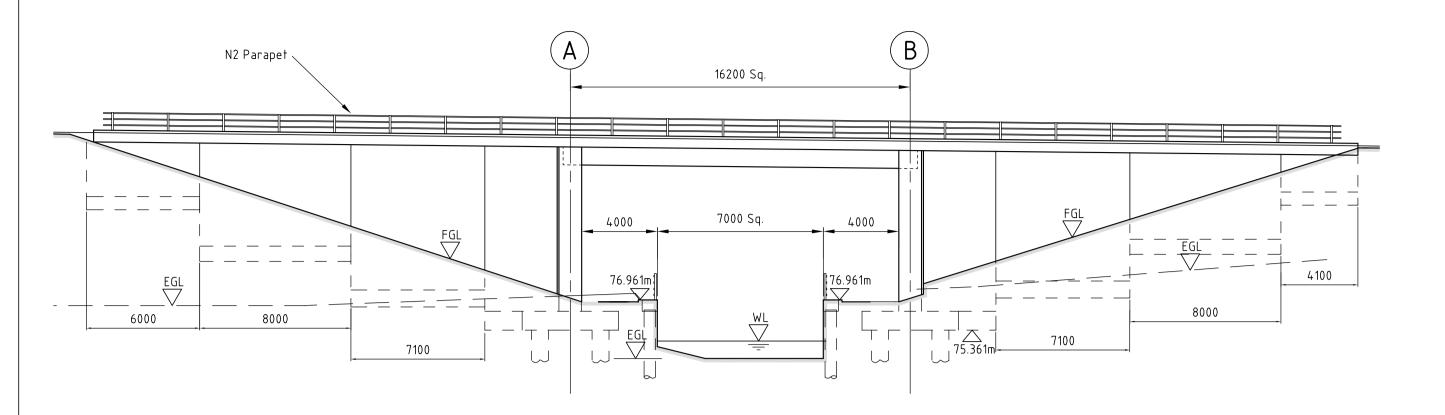


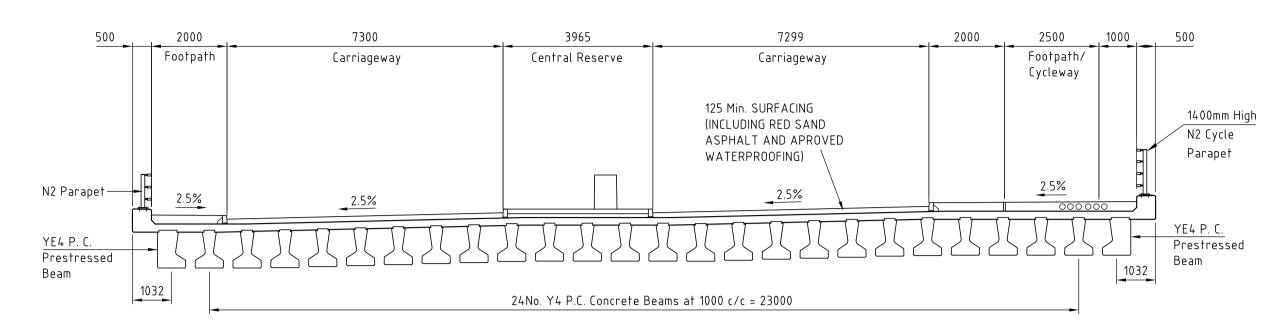
Drawn	CL	Checked	SC	Approved	NH
Date	12/08/2013	Date	12/08/2013	Date	12/08/2013
Size	A4	Scale	1:1,250		
GIS Task	4268	Filename			
Drawing	No. 1007-3D-DE7-Δ6-	ΜΔ_ΒΩΩ5	<u>-ΔΙΡ</u>	Revision	



B005 - Mill Hill Hollow Bridge Preliminary Design Report

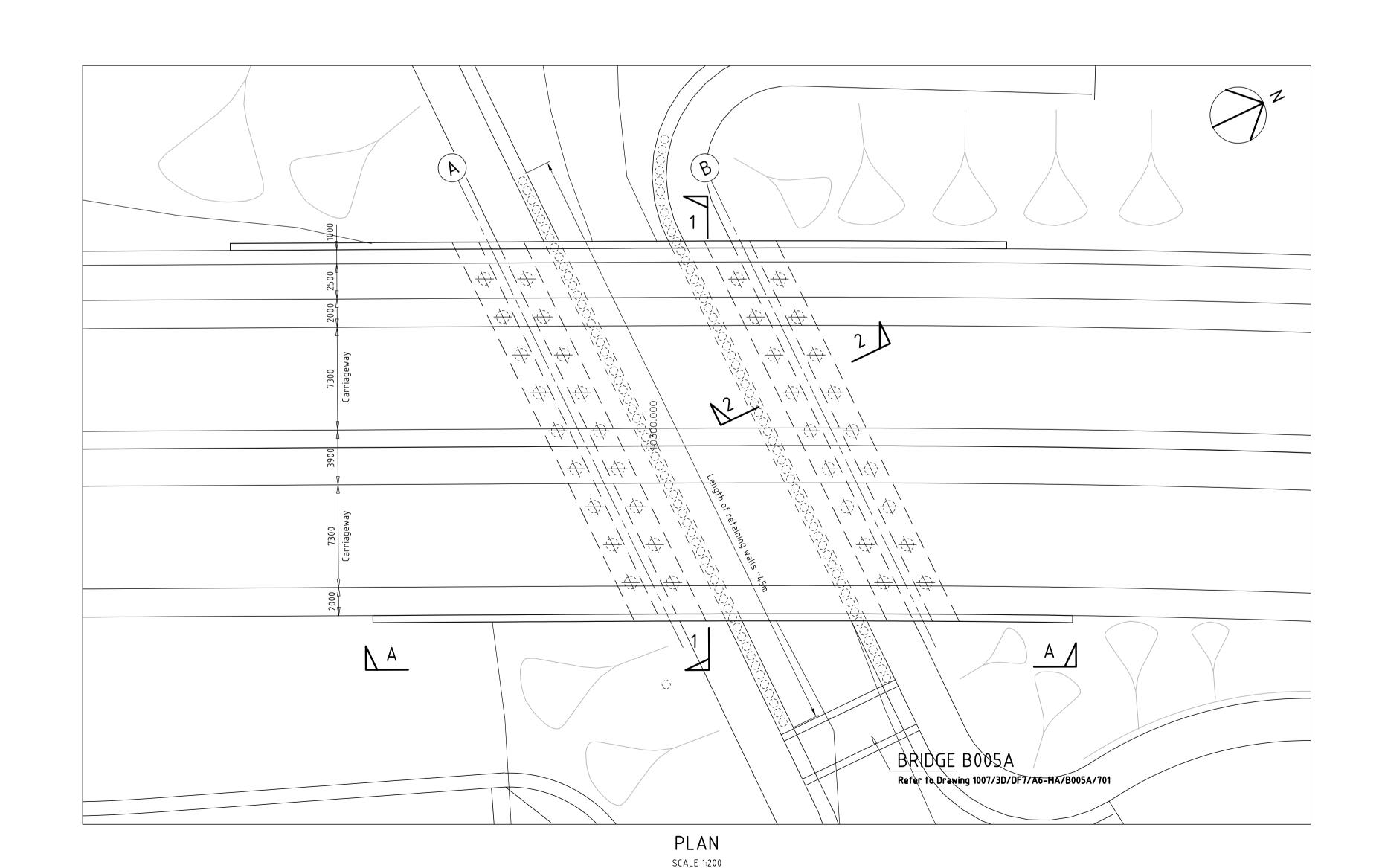
Appendix B: Proposed General Arrangement Drawing 3D Model

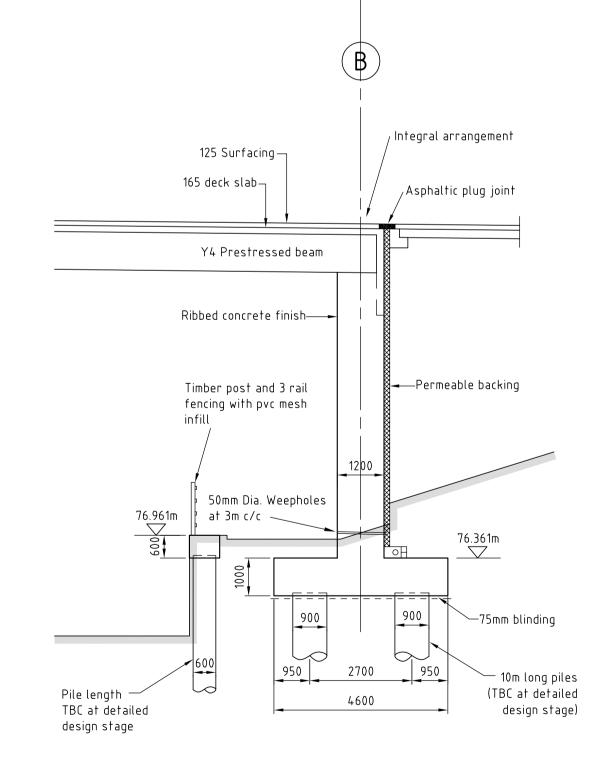




ELEVATION A-A

SECTION 1–1





SECTION 2-2

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# **NOTES**

- This drawing has been produced based on the latest MX highway model - D.F.7, as provided by the client (July 2013).
- This drawing has been produced mainly for the purpose of preliminary design and planning.
- 3. Levels are in metres and above Ordnance Datum.
- 4. All dimensions are in millimetres.
- 5. The option shown in this drawing is not for construction
- 6. The foundation type shown on the drawing is based on the latest available geotechnical information.
- 7. Basic preliminary design has been undertaken to determine the geometry of the section sizes as per client's
- 8. Concrete strengths:-

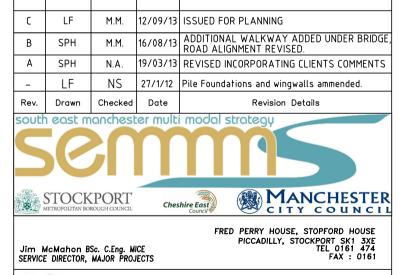
instruction.

Precast panel	C32/ 40
Piles	C32/ 40
Abutment diaphragm	C40/50
Deck slab	C40/50
Parapet edge beams	C40/50
Precast beams	C50/60

# 9. Permanent formwork is required.

# 10. Concrete finishes to be as per MCHW specification series 1700 U.N.O. :-

Burried foundations :	F1, U1.
Abutment columns :	F1.
Buried face of abutment	: F1.
Waterproofing:	F4.
Precast beams :	F5.
Precast concrete panel	F4.
Parapet edge beam :	F3, U3.
Deck slab top surface :	U4.

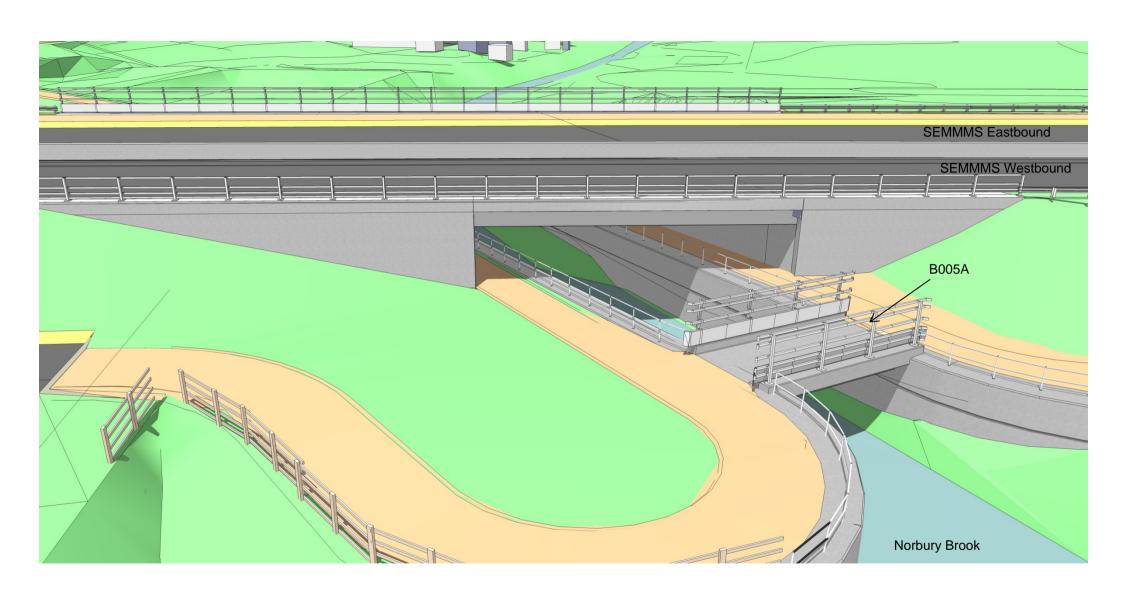


# A6 TO MANCHESTER AIRPORT RELIEF ROAD

Drawing Title

# MILL HILL HOLLOW BRIDGE GENERAL ARRANGEMENT

Drawn	Engineer	Checked	Appro	ved
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B005 - Mill Hill Hollow Bridge B005A - Pedestrian Bridge over Norbury Brook



B005 - Mill Hill Hollow Bridg Preliminary Design Report	ge Stockport Metropolitan Borough Council
Appendix C:	Reviewed Ground Investigation Information



Project: SEMMS Job No: 37732ISG Borehole No. **Co-ordinates:** E 391771.0 N 384987.7 Date: 12-05-1992/12-05-1992 **Ground Level:** 76.51 (m) EA POYNTON 98\_1 Contractor: GEOTECHNICAL ENGINEERING LIMITED Engineer: Faber Maunsell Ltd Sheet: 1 of 1

		& Tests	, .	Water/			Strata	
Depth	Type No	Test Results	TCR SCR RQD	If (Flush Return)	U.D.	Depth (Thickness)	Description	Legend
	110		KgD		76.31		TOPSOIL: Dark brown friable sandy with rootlets.	
					70.31	0.20	Loose brown silty fine, medium and coarse gravelly SAND, in	хо
50 050	D FFO CDT	N - 0(075)					places lightly organic.	×
.50 0.50	D 5811	N = 6(375mm) 0 1/1 1 1 3				(1.00)		×
						(1.00)		-~×
.00	D 5812					ļ.		
.00	0012				75.31	1.20		xo
40 1.40	D ===0 0					-	Red-brown completely weathered fine and medium grained	
.40 1.40	B 559 C D 5813	N = 0(600mm) 16 50/0 0 0 0				-	SANDSTONE, with occasional subrounded and rounded coarse gravel. Recovered as sand with fragments of very	
						-	weak sandstone.	
						-		
2.00	C	N = 0(600mm) 31 50/0 0 0 0				-		
		31 50/0 0 0 0				(2.00)		
						-		
2.60	C	N = 0(525mm)				-		
2.00		N = 0(525mm) 50 0/0 0 0 0				-		
						L		
					73.31	3.20		
.20 3.20	D 5814 C	N = 0(600mm) 31 50/0 0 0 0				-	Red-brown highly to completely weathered SANDSTONE, very weak. (flush returns only)	
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SW BH LOG (CP.								
S3_NEW.GLB								
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l	Method, Equipment and Remarks	
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Project: SEMMS Job No: 37732ISG Borehole No. **Co-ordinates:** E 391809.5 N 384964.6 Date: 08-05-1992/08-05-1992 **Ground Level:** 78.87 (m) EA POYNTON 98\_2 Contractor: GEOTECHNICAL ENGINEERING LIMITED Engineer: Faber Maunsell Ltd Sheet: 1 of 1

			& Tests	I=		Water/			Strata		
Dep	th	Type No	Test Results	TCR SCR RQL	If (mm)	(Flush Return)	O.D. Level	Depth (Thickness)	Description	Legend	
				Ť					TOPSOIL: firm dark-brown peaty		
							78.57		Firm brown and orange mottled very sandy CLAY.	x	
0.50	0.50	B 5815SPT	N = 8(450mm) 1 2/2 2 2 2				78.17	(0.40)		× ×	
			,					_	Loose orange and brown fine and medium SAND with small lenses of peat.	XO X	
1.00		D 5816						- (0.80)	lenses of peat.	×o	
1.20		U 5817								~ ×	
							77.37	1.50	Medium dense brown fine, medium and coarse clayey SAND	0-0	
1.70	1.70		N = 18(450mm)						and subangular and subrounded fine, medium and coarse	<u> </u>	
-		D 5818	6 5/4 5 4 5					(1.10)	GRAVEL.		
								- (1.10)		0 0	₹
	2.30	С	N = 17(450mm) 3 5/3 4 3 7				<b>50.05</b>	[		0 0	
							76.27	2.60	Medium dense brown fine, medium and coarse very silty	XO T	
2.90	2.90	B 561 SPT	N = 16(450mm)					(0.50)	SAND.	_~~	
•			12/3355				75.77	3.10	Firm brown silty slightly sandy CLAY.	<del>-</del>	
3.40		D 5819						-	This storm only ongular outling outling	×	
3.50		U 5820						- (1.00)		× _ ×	2
										x	4
4.00	4.00	D 582 ISPT	N = 15(450mm)				74.77	4.10			
			5 5/5 3 3 4					- -	Medium dense orange-brown fine and medium SAND. Below 4.50m: red-brown	×0	₹
4.50		D 5822						Ē		×	
4.70	4.70	B 562 SPT	N = 41(450mm)							× -	
-			4 5/7 9 11 14					_			
5.20		D 5823						(2.30)		×0	
	5.30	SPT	N = 60(450mm) 5 4/9 13 17 21					[		× ~	
								-		×	
5.80	5.90	D 5824 SPT	N = 114(450mm					-		×	
-			4 5/10 20 34 50					-		~~~	
6.40		D 5825					72.47	6.40		× ,	
0.40		5025						-	End of Borehole		
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Water Strikes												
Strike Depth	Casing Depth	Post Mins	Post Depth	Flow Remarks								
2.20		20	2.20	No rise in 20								
4.30		20	3.70	minutes								

	method, Equipment and Rem	arks
Method: CP		



Project: SEMMS Job No: 37732ISG Borehole No. Date: 11-05-1992/11-05-1992 **Co-ordinates:** E 391792.7 N 385014.2 EA POYNTON 98\_3 Ground Level: 79.07 (m) Contractor: GEOTECHNICAL ENGINEERING LIMITED Engineer: Faber Maunsell Ltd Sheet: 1 of 2

		Samples	& Tests			Water/			Strata	
Dept	h	Type No	Test Results	TCR SCR RQD	If (mm)	(Flush Return)	O.D. Level	Depth (Thickness)	Description	Legend
				RgD				-	TOPSOIL: Firm brown sandy clay with rootlets.	
								-		
0.50	0.50	D 5826SPT	N = 5(450mm)					[ (0.90)		
			1 1/1 1 1 2					[		
00		D 5007					78.17	0.90	Firm friable brown sandy CLAY with sand lenses.	
.00		D 5827 U 5828						(0.60)	,	ļ
.20		0 3626					77.57	- ' '		
							77.07	- 1.00	Medium dense brown fine, medium and coarse SAND and	0 0
.70	1.70	D 5829SPT	N = 35(450mm) 2 2/4 9 10 12					-	subangular sand subrounded fine and medium GRAVEL, occasional rounded coarse gravel.	
			,					-		
.20		D 5830								0 0
.40	2.40	В 563 С	N = 55(450mm) 11 14/13 14 13					[ (1.70)		0 - 0
		U 595	15 14/13 14 13					-		
	2.90	c	N = 74(300mm)							0 0
			8 17/24 50 0 0				75.87	3.20		0_0
									Red-brown highly to completley weathered medium and	
	3.50	С	N = 0(600mm)					ţ	coarse grained SANDSTONE, with occasional rounded gravel. Recovered as sand.	
			31 50/0 0 0 0							
								- (1.40)		
10	4.10	В 564 С	N = 0(600mm) 22 50/0 0 0 0					-		
			22 30/0 0 0 0					-		
	4.60	С	N = 0(525mm)				74.47	4.60	Below 4.60m: very weak friable poorly cemented with very	
			50 0/0 0 0 0					[	closely spaced subhorizontal sandy discontinuities. Rare	
								-	subrounded pebble inclusions.	
								-		
								-		
								-		
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	6.10	С	N = 0(525mm) 50 0/0 0 0 0					[		
			50 0/0 0 0 0					-		
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								[		
								<u> </u>		
	7.60	С						(6.13)		
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	9.10	С								
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Water Strikes Strike Depth Casing Depth Post Depth Flow Remarks

	Method, Equipment and Remarks								
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Project: SEMMS

Date: 11-05-1992/11-05-1992

Co-ordinates: E 391792.7 N 385014.2

Contractor: GEOTECHNICAL ENGINEERING LIMITED

Date: 12-05-1992/11-05-1992

Contractor: GEOTECHNICAL ENGINEERING LIMITED

Date: 13-05-1992/11-05-1992

Contractor: GEOTECHNICAL ENGINEERING LIMITED

Date: 13-05-1992/11-05-1992

Sheet: 2 of 2

		& Tests			Water/	Vater/ Strata				
Depth	Type No	Test Results	TCR SCR	If (mm)	Water/ (Flush Return)	O.D.	Depth (Thickness)	Description	Legend	Backfill/
	110	11054105	KgD			LCVCI	-	Below 4.60m: very weak friable poorly cemented with very		
							-	Below 4.60m: very weak friable poorly cemented with very closely spaced subhorizontal sandy discontinuities. Rare subrounded pebble inclusions. <i>(continued)</i>		
							-	Substituted people inclusions, (continued)		
10.60	С	N = 0(600mm) 31 50/0 0 0 0				68.34	10.73			
		31 30/0 0 0 0					-	End of Borehole		
							-			
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Strike Casing Post Post Depth Depth Mins Depth Flow Remarks

Method: RO

AGS3 NEW.GLB | SW BH LOG (CP/RC) | K:\47060785 - SEMMS\\\\\\\O50301 | 10:26:14

Logged By:

Data Checked By:



Project: SEMMS Job No: 37732ISG Borehole No. **Co-ordinates:** E 391829.2 N 385001.9 Date: 08-05-1992/11-05-1992 **Ground Level:** 77.35 (m) EA POYNTON 98\_4 Engineer: Faber Maunsell Ltd Contractor: GEOTECHNICAL ENGINEERING LIMITED Sheet: 1 of 2

	Samples	& Tests	, ,	Wate			Strata		
Depth	Type No	Test Results	TCR SCR RQD	(Flu	o.D.	Depth (Thickness)	Description	Legend	
	140	Results	RgD		Level	- (1 mckness)	TOPSOIL: Dark brown peaty sandy with rootlets.		
					77.05	0.30			
0.5	D 5001 G	N = 4(450 · · · · )				ţ	Very loose brown grey fine, medium and coarse gravelly SAND with bands of firm brown mottled grey slightly sandy	xo x	
0.50	D 5831 C	N = 4(450mm) 1 1/1 1 1 1				+	clay with much gravel.	\ô	
		,				ļ.	y g		
						(1.20)		× -	
						-		<u>×</u>	
						ļ.		×0 1	
					75.85	1.50			
						+	Loose orange-brown medium and coarse SAND and fine and	0-0	
1.70	B 565 SPT D 5832	N = 9(450mm) 1 1/2 2 2 3				F	medium sub-angular and subrounded GRAVEL.		
	D 3632	1 1/2 2 2 3				- (0.80)			
)	5 5000							0 0	
	D 5833				75.05	2.30	Red-brown highly to completely weathered fine and medium	1	
2.40	SPI	N = 50(225mm) 10 26/50 0 0 0				+	SANDSTONE. Very weak, poorly cemented with rare subrounded pebble inclusions. Below 3.00m: medium and		
						F	subrounded pebble inclusions. Below 3.00m: medium and		
						ţ	coarse. 6.20m: coarse subrounded gravel sized pebbles recovered.		
3.00	) c	N = 0(600mm)				-	1 covered.		
		31 50/0 0 0 0				F		1:::::	
						ţ			
						+			
3.60	C	N = 0(525mm) 50 0/0 0 0 0				F			
		300/0000				ţ			
						-			
4.20	c	N = 0(600mm)				F			
4.2		21 50/0 0 0 0				ţ		1::::::	
						}			
4.70	)	N = 0(525mm)				F		1:::::	
1.7		50 0/0 0 0 0				ţ.			
						F			
						-			
						1		1:::::	
						ţ			
						}			
						Į.			
						<u></u>			
6.20	) c	N = 0(600mm)				+			
		27 50/0 0 0 0				F			
						(8.40)			
						t			
						F			
						F			
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						-			
						‡			
7.70	С					t			
		50 0/0 0 0 0				F			
						F			
						-			
						F			
						ţ			
						Ł			
						E		1:::::	
						F			
9.20	C	N = 0(600mm) 31 50/0 0 0 0				F			
		31 30/0 0 0 0				ţ			
	1	I	1 1	1		L		1	
						-			

JT   23/11/2011   10:26:16	- - - - - - - -	6.20		С	N = 0(600r 27 50/0 0	nm) 0 0			
AGS3_NEW.GLB   SW BH LOG (CP/RC)   KN4.7060785 - SEMMS\05.0 PROJECT INFORMATION\GINT\4.7060785-SEMMS.GP.)   AGS3_NEW.GDT   23/11/2011   10.26.16	- - - - - - - - - - - - - - - - - - -	7.70		С	N = 0(525r 50 0/0 0 0	mm) ) ()			
- SEMMS\05.0 PROJECT INFORMA	- - - - - - - - - - -	9.20		С	N = 0(600r 31 50/0 0	nm) 0 0			
60785				ļ					
K:\470					Strikes				
P/RC)	Strike Depth	Casing Depth	g Po 1 Mi		Post Depth	Flow	Rem	arks	
SW BH LOG (C									
AGS3_NEW.GLB	Casla	1.50 @	24	OI.	A. COTO	OKDO	DYL 3	(IIXIV	
~	Scale:	1:50 @	A4	Cli	ent: STC	CKPO.	KI, M	1ETE	КO

	Method, Equipment and Remarks
	Method: CP
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Project: SEMMS Job No: 37732ISG Borehole No. **Co-ordinates:** E 391829.2 N 385001.9 Date: 08-05-1992/11-05-1992 Ground Level: 77.35 (m) EA POYNTON 98\_4 Contractor: GEOTECHNICAL ENGINEERING LIMITED Engineer: Faber Maunsell Ltd Sheet: 2 of 2

Depth		Туре	Test Resul	t Ite	TCR SCR RQD	If (mm)	Water/ (Flush Return)	O.D.	Depth	Description	Legend
		No	Resu	ııs	RQD	()		Level	(Thickness)		
									- - -	Red-brown highly to completely weathered fine and medium SANDSTONE. Very weak, poorly cemented with rare subrounded pebble inclusions. Below 3.00m: medium and coarse. 6.20m: coarse subrounded gravel sized pebbles recovered. (continued)	
								66.65	10.70	recovered. (continued)	
									-	End of Borehole	
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			Strikes							Method, Equipment and Remarks	
ike (	Casing Depth	Post Mins	Post Depth	Flow	Rem	arks	Metho	od: CP			
$\top$											
- 1		1	1 1								





Project: SEMMS Job No: 37732ISG Borehole No. **Co-ordinates:** E 391805.1 N 385035.9 Date: 21-04-1992/22-04-1992 **Ground Level:** 77.64 (m) EA POYNTON 98\_5

Engineer: Faber Maunsell Ltd Contractor: GEOTECHNICAL ENGINEERING LIMITED Sheet: 1 of 2

		Samples	es & Tests			Water/			Strata	
Dep	th	Type No	Test Results	TCR SCR RQD	If (mm)	(Flush Return)	O.D. Level	Depth (Thickness)	Description	Legend
							77.24	- (0.40) - 0.40	Turf over TOPSOIL	
0.45	0.45	D 5834SPT	N = 23(450mm) 4 4/5 5 6 7						Medium dense brown fine, medium and coarse silty SAND and GRAVEL.	0 0
0.90		D 5835						- -(1.20)		
1.20	1.20	В 566 С	N = 27(450mm) 4 5/5 7 7 8				76.04	1.60		
-	1.80	SPT	N = 22(450mm) 3 4/4 5 5 8				70.01	- - - -	medium dense red-brown fine, medium and coarse slightly silty SAND. Trace fine gravel. Below 3.00m: dense.	×0
2.25 2.40	2.40	D 5836 B 567 SPT D 5837	N = 30(450mm) 4 5/5 6 8 11					-		×
2.85	3.00	D 5838 SPT	N = 36(450mm) 5 8/8 9 9 10					- (2.40) - -		
3.45	3.60	D 5839 SPT	N = 37(450mm) 6 5/8 9 9 11					-		×0
4.00 4.05	4.20	U 596 B 666 D 5846SPT	N = 34(450mm) 6 7/7 8 8 11				73.64	4.00	Dense red-brown medium SAND. Below 7.80m: orange-brown fine, medium and coarse gravelly sand. Below 9.50m: very dense.At 12.00m: dense. Below 13.75: red-brown.	0 X
4.65	4.80	D 5841 SPT	N = 39(450mm) 6 8/8 9 11 11						Tea Stown.	
5.25	5.40	D 5842 SPT	N = 42(450mm) 7 8/9 11 11 11							
5.85 6.00	6.00	D 5843 W 584 <b>5</b> PT	N = 40(450mm) 6 8/8 9 11 12					-		
6.45		D 5845								<u></u>
7.00 7.05	7.20	B 568 U 597 D 5846SPT	N = 44(450mm) 8 8/9 11 11 13					-		
7.65	7.80	D 5847 SPT	N = 44(450mm) 8 9/10 10 11 13							
7.05 7.65 8.25	8.40	D 5848 SPT	N = 49(450mm) 9 10/11 12 12 14							
8.85	9.05	D 5849 SPT	N = 47(450mm) 9 10/10 12 12					- - - -		
9.50	9.55	D 5850 <sub>SPT</sub>	N = 51(450mm) 9 11/11 12 13					- (11.00)		

AGS	Scale:	1:50 @	A4	Cli	ient: STC	OCKPO	RT M	ŒTE	 RC
AGS3_NEW.GLB									
вн соб									
(CP/R(	Depth 6.50	Dept	п	Mins 20	1.10	Fast in			+
- C	Strike	Casir	ıg	Post	Post	Flow	Rem	arks	+
14706			v	Vater	Strikes				$\overline{}$
0785									
- SEM	-				15	-			
MS\05	9.50	9.55	D 58	850 <sub>SPT</sub>	N = 51(450 9 11/11 1				
.0 PR0	-				13				
)ECT	<u>-</u>	9.05		SPT	9 10/10 1				
INFORM	- - 8.85		D 58	349					
A TION\	-				9 10/11 1 14				
4\TNI	- 8.25 -	8.40	D 58	348 SPT	N = 49(450				
706078	<del>-</del> -				0 9/10 10	11 13			
5-SEM	- 7.00 - -	7.80	טט ען	SPT	N = 44(450 8 9/10 10				
MS.GPJ	- - - 7.65		D 58	247					
AGS	_ 7.03 - -	7.20	D 58	346SPT	N = 44(450 8 8/9 11				
SW BH LOG (CP/RC)   K1,4706.0785 - SEMMS\05.0 PROJECT INFORMATION\GINT\4706.0785-SEMMS.GPJ   AGS3_NEW.GDT   23/11/2011   10.26.18	7.00 7.05		B 56 U 59						
T   23/1	- 6.45 - -		D 58	345					
1/2011	- 0.45		D 50	.45	,				
10:26:1	6.00	6.00		34 <b>4</b> 5PT	N = 40(450 6 8/8 9 11				
	- 5.85		D 58	343					

	Method, Equipment and Remarks	
1	Method: CP	

Client: STOCKPORT METROPOLITAN BOROUGH COUNCIL Logged By: Data Checked By:



Project: SEMMS Job No: 37732ISG Borehole No. **Co-ordinates:** E 391805.1 N 385035.9 Date: 21-04-1992/22-04-1992 EA POYNTON 98\_5 Ground Level: 77.64 (m) Contractor: GEOTECHNICAL ENGINEERING LIMITED Engineer: Faber Maunsell Ltd Sheet: 2 of 2

Denth	Туре	Test	TCR	If	(Flush	O.D.	Depth	Description	Lagand	Doot-611/
Depth 10.00	No B 560	Results	RQD	(mm)	Return)		(Thickness)	Description  Dense red-brown medium SAND, Relow 7,80m.	Legend	4
10.15	U 598 SPT	N = 53(450mm) 9 11/11 12 14					-	Dense red-brown medium SAND. Below 7.80m: orange-brown fine, medium and coarse gravelly sand. Below 9.50m: very dense.At 12.00m: dense. Below 13.75:		
		16					-	red-brown. (continued)		
10.60	D 5851						[			
							-			
11.10	D 5852						-			
11.35	SPT	N = 50(450mm) 9 10/11 11 12								
		16					-			
11.80 11.95	D 5853 SPT	N = 48(450mm) 10 10/11 11 12					_			
		10 10/11 11 12 14					-			
12.40	D 5854									
12.55	SPT	N = 56(450mm) 11 12/12 14 14					-			
19.00	D 570	16								
13.00 13.15	B 570 D 5855 <sub>SPT</sub>	N = 55(450mm)					-			
19.50	D ESC	9 11/11 13 14 17					[			
13.50	D 5856	N = 69(450 · · · )					-			
13.75	SPT	N = 63(450mm) 10 12/12 16 17 18					_			
14.20	D 5857	10					- -			
							[			
14.55	SPT	N = 64(450mm) 12 12/13 15 17 19					-			
15.00		19				62.64	15.00			
15.00	D 5858						-	End of Borehole		
							- -			
							-			
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	I.	I			I	I .				
	Water	Strikes					<u> </u>	Method, Equipment and Remarks		
Strike Casin Depth Dept	ng Post th Mins	Post Flow	v Rem	arks	Meth	od: CP				
- + *										

		Water	Strikes	
Strike Depth	Casing Depth	Post Mins	Post Depth	Flow Remarks

Method, Equipment and Remarks	
Method: CP	1
	Method, Equipment and Remarks  Method: CP





Project: SEMMS Job No: 37732ISG Borehole No. **Co-ordinates:** E 391844.6 N 385025.5 Date: 23-04-1992/24-02-1992 **Ground Level:** 78.28 (m) EA POYNTON 99\_1

Engineer: Faber Maunsell Ltd Contractor: GEOTECHNICAL ENGINEERING LIMITED Sheet: 1 of 2

	enth Type   _ Test   SC					Water/		Strata					
		Type No	Test Results	TCR SCR RQD	(mm)	(Flush Return)	O.D. Level	Depth (Thickness)	Description	Legend			
				r/An				-	TOPSOIL: (turfed)				
							77.98	0.30	Loose brown fine and medium slightly clayey SAND.	XO .			
0.45	0.45	B 571 SPT D 5859	N = 9(450mm) 1 2/2 2 3 2					(0.00)		×			
0.00		D 5860						(0.80)		_ ×_			
0.90							77.18	1.10	Dense yellow-brown fine, medium and coarse silty very	X0			
1.20		B 572						[	gravelly SAND with occasional cobbles.	-X			
	1.65	SDT	N = 33(450mm)					-		×			
	1.00	SFI	5 5/6 8 8 11					[ (1.70)		×— <sub>8</sub>			
•								[_(1.70)		Xo-			
	2.25	С	N = 36(450mm) 5 7/8 8 9 11					[		x o			
			,					F		× -			
2.80	2.80	В 573 С	N = 56(450mm)				75.48	2.80	Very dense brown subrounded medium and coarse GRAVEL,	0 - 0			
			8 9/11 11 15 19					F	occasional cobbles.				
3.40	3.40	U 599 C	N = 54(450mm)					(1.20)		0 0			
0.40	0.40	0 333 C	9 14/15 11 14					E		<del>-</del> -			
							74.28	4.00		0-0			
4.00	4.00	В 574 ЅРТ	N = 47(450mm) 5 9/10 11 11 15				71.20	- 1.00	Very dense orange-brown fine, medium and coarse gravelly SAND.	XO X			
4.45		D 5861						-	OAND.	×			
4.40	4.60		N = 58(450mm)					[		×			
			6 9/11 15 15 17					-		  xo			
5.05 5.20		D 5862	N = 50(450mm)					E I		- ×			
5.20	5.20	D 373 SF1	8 8/10 11 15 14					(3.00)		~ ×			
5.65		D 5863						(5.56)		[x			
	5.80	SPT	N = 55(450mm) 9 11/12 12 14					Ė		×0			
0.05		D 5004	17					-		o			
6.25	6.40	D 5864 SPT	N = 68(450mm)					[		× -			
			11 12/14 14 17 23					-		- X-			
6.85	7.00	D 5865	N = 0(600mm)				71.28	7.00		X			
	7.00		28 50/0 0 0 0					Ė	Weak red-brown SANDSTONE.				
								-					
								[					
								-					
								[					
								[					
-								-					
								[					
								(5.30)					
								t					

		Water	Strikes				N	lethod, I	Equipment	and Rema	rks		
Strike Depth	Casing Depth	Post Mins	Post Depth	Flow Rem	arks	Method: CP							
			1	I		11							



 Project: SEMMS
 Job No: 37732ISG
 Borehole No.

 Date: 23-04-1992/24-02-1992
 Co-ordinates: E 391844.6 N 385025.5
 Ground Level: 78.28 (m)
 EA
 POYNTON 99\_1

 Contractor: GEOTECHNICAL ENGINEERING LIMITED
 Engineer: Faber Maunsell Ltd
 Sheet: 2 of 2

Samples & Tests   Test   Test		Samples				Water/	Strata  O.D. Depth Level (Thickness)  Description Legend							
Weak red-brown SANDSTONE. (continued)	Depth	Type	Test Results	TCR SCR	If (mm)	(Flush Return)	O.D.	Depth	Description	Legend	ackfi			
End of Borchaic		110		KgD			Dever	-	Weak red-brown SANDSTONE. (continued)		T #			
End of Borchole								-						
55.98 T2.30 End of Borehole								-						
65.38 12.30 End of Borchole								-						
End of Borchole								-						
End of Borehole								_						
End of Borehole														
End of Borehole								-						
End of Borehole								-						
65.98 12.30 End of Borehole								-						
65.98 12.30 End of Borehole								-						
65.98   12.30   End of Borehole								-						
End of porenoie							65.98	12.30	Park of Danish da					
								-	End of Borenole					
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Strike Casing Depth Post Depth Flow Remarks

Strike Depth Depth Depth Post Depth Flow Remarks

AGS3\_NEW.GLB | SW BH LOG (CP/RC) | KA47060785 - SEMSYOS.0 PROJECT INFORMATION/GINT\47060785-SEMS.GP | AGS3\_NEW.GDT | 23/11/2011 | 10:26:20

	Method, Equipment and Remarks													
	Method: CP													
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Project: SEMMS Job No: 37732ISG Borehole No. **Co-ordinates:** E 391844.2 N 385028.8 Date: 06-05-1992/06-05-1992 **Ground Level:** 78.51 (m) EA POYNTON 99

Contractor: GEOTECHNICAL ENGINEERING LIMITED Engineer: Faber Maunsell Ltd Sheet: 1 of 2

		& Tests	mc-		Water/	_		Strata	
Depth	Type No	Test Results	TCR SCR RQD	If (mm)	(Flush Return)	O.D. Level	Depth (Thickness)	Description	Legend
			Ĭ				- (0.40)	TOPSOIL	
						78.11	0.40)		
							_	Dense brown slightly clayey medium SAND and GRAVEL.	- 0
									<u> </u>
							-		
							_		-
							-		
							(2.10)		<u>-</u>
							-		
							-		
							-		L
							-		0-0
						76.01	2.50	Red-brown medium coarse SAND. Sparse gravel.	×0-
							-	Red-brown medium coarse SAND. Sparse graver.	- ×
							-		×
							-		-×
							-		\\&
							(2.10)		хо
							- (2.10)		,—×
							-		~~×
							-		×
							-		×o-
						73.91	4.60		- x
							-	Red-brown weakly cemented SANDSTONE with sparse	
							-	gravel.	
							-		
							-		
							(2.30)		
							-		
							[		
							_		
						71.61	6.90	Red-brown highly weathered poorly cemented medium and	
							-	coarse SANDSTONE. Very weak with very closely spaced	
							-	sub-horizontal sandy discontinuities. Rare subrounded pebble inclusions, moderately weathered, wea. 8.80m to	
7.50	С	N = 0(525mm) 50 0/0 0 0 0					-	pebble inclusions, moderately weathered, wea. 8.80m to 9.00m, 9.60m to 10.60m. 9.50m. Pebbly bed. Below 10.60m: highly to completely weathered. Very weak. 13.10m to 14.50m: occasional pebbles. Very weak mudstone	
		50 0/0 0 0 0					-	to 14.50m; occasional pebbles. Very weak mudstone	
							-	inclusion.	
							-		
							-		
							-		
							<u> </u>		
							-		
9.00	C	N = 0(525mm) 50 0/0 0 0 0					-		
		,					[		
							[		
							-		
							-		[:::::]
		1					-		1

10:26:21	-								
23/11/2011	- - -								
NEW.GDT	- - -								
PJ AGS3	- - -	7.50		С	N = 0(525r	,,,,,)			
85-SEMMS.C	- - -	7.50			50 0/0 0 0	0 0			
NT\4706078	<del>-</del> - -								
MATION\G	-								
JECT INFOR	- - -	9.00		С	N = 0(525r 50 0/0 0 0	nm) ) ()			
S\05.0 PRC	- - -								
AGS3_NEWGLB   SW BH LOG (CP/RC)   KN47060785 - SEMMS\05.0 PROJECT INFORMATION/GINT\47060785-SEMMS.GP.)   AGS3_NEW.GDT   23/11/2011   10:26:21	- - -								
.047060			Wa	ter	Strikes				7
2/RC)   P	Strike Depth	Casin; Depth		ost ins	Post Depth	Flow	Rem	arks	
H LOG (CF									
B   SW B									
3_NEW.GL									
AGS	Scale:	1:50 @	A4	Cli	ent: STC	OCKPO!	RT M	ÆΤ	20

l	method, Equipment and Remarks	
	Method: RO	1
ı		



Project: SEMMS Job No: 37732ISG Borehole No. **Co-ordinates:** E 391844.2 N 385028.8 Date: 06-05-1992/06-05-1992 **Ground Level:** 78.51 (m) **POYNTON 99** EA

Contractor: GEOTECHNICAL ENGINEERING LIMITED Engineer: Faber Maunsell Ltd Sheet: 2 of 2

	Samples	& Tests			Water/			Strata				
Depth	Type No	Test Results	TCR SCR	If (mm)	(Flush Return)	O.D.	Depth (Thickness)	Description	Legend	Backfill/		
			, KgD				- (8.00)	Red-brown highly weathered poorly cemented medium and coarse SANDSTONE. Very weak with very closely spaced sub-horizontal sandy discontinuities. Rare subrounded pebble inclusions, moderately weathered, wea. 8.80m to 9.00m, 9.60m to 10.60m. 9.50m. Pebbly bed. Below 10.60m: highly to completely weathered. Very weak. 13.10m to 14.50m: occasional pebbles. Very weak mudstone inclusion. (continued)		H		
13.00	С	N = 0(600mm) 27 50/0 0 0 0										
						63.61						
								End of Borehole				
							-					
							- - -					

AGS3_NEW.GLB   SW BH LOG (CP/RC)   KX4.7060785 - SEMMS\OSO PROJECT INFORMATION\GINT\4.7060785-SEMMS.GPJ   AGS3_NEW.GDT   22/11/2011   10:26.21									
- SEMI	-								
060785									
K:\47	Strike	Casing	Wate		Strikes Post				
CP/RC)	Depth	Casing Depth	Min	s	Depth	Flow	Rem	arks	$\parallel$
SW BH LOG (0									
.GS3_NEW.GLB									
⋖	Scale:	1:50 @ A	4 (	Cli	ent: STC	OCKPO!	RT N	ÆTE	30

Method: RO			

Method, Equipment and Remarks



Project: SEMMS Job No: 37732ISG Borehole No. **Co-ordinates:** E 391836.0 N 385065.9 Date: 03-04-1992/03-04-1992 **Ground Level:** 79.19 (m) EA POYNTON 99\_2 Engineer: Faber Maunsell Ltd Contractor: GEOTECHNICAL ENGINEERING LIMITED Sheet: 1 of 1

		Samples & Tests Water/ Strata								
Dept	th	Type No	Test Results	TCR SCR ROD	If (mm)	(Flush Return)	O.D. Level	Depth (Thickness)	Description	Legend
				1.92				-	Turf over TOPSOIL.	
							78.89	0.30	Firm brown silty slightly sandy CLAY.	x
0.50	0.50	D 5866SPT	N = 6(375mm) 1 0/1 1 2 2					(0.70)		<u>×</u>
			10/1122					[ (0.70)		× ×
1.00		D 5867					78.19	1.00		
1.20		U 5868						-	medium dense grey-brown fine, medium and coarse SAND and GRAVEL. At 2.80m: very gravelly with occasional	0 0
1.20		0 3606						-	cobbles.	
1.60		B 576						-		
1.70	1.70	U 600 SPT	N = 15(450mm) 2 2/3 3 5 4					-		
		D 5869	22/3354					(2.10)		0-0
2.20		D 5870						- (2.10)		
2.20	2.30	SPT	N = 23(450mm) 3 4/4 7 5 7					-		F
			34/4737					-		o _ o
2.80		D 5871								- 0 -
	2.90	SPT	N = 50(225mm) 11 21/50 0 0 0				76.09	3.10		- 0 -
3.20	3.20	D 5872SPT	N = 37(450mm)				75.89	3.30	Dense yellow brown fine, medium and coarse gravelly SAND.	хо
3.30		B 577	3 5/7 8 8 14					- 3.30	Dense red-brown fine, medium and coarse SAND with	
								-	occasional thin clayey bands above 3.70m. Becoming darker in colour with depths. (completely weathered sandstone)	
3.70	3.80	D 5873 SPT	N = 47(450mm)					-	,	
			5 7/9 11 12 15					- 1		
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4.30	4.40	D 5874 SPT	N = 61(450mm)					-		
			5 7/11 14 15 21					(2.65)		
4.90	5.00	D 5875 SPT	N = 83(450mm)					_		
			10 15/17 17 22 27							
		D 5050						-		
5.50	5.60	D 5876 SPT	N = 117(425mm)					-		
			5 7/15 21 31 50				73.24	5.95		
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C)   K:\470607	Strike	Casing	Po	st	Post	Flow	Rem	arks	1
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W BH LOG (CP/RC)   K:\470607	Strike Depth	Casing Depth	Po	st	Post	Flow	Rem	arks	
3   SW BH LOG (CP/RC)   K:\470607	Strike Depth	Casing Depth	Po	st	Post	Flow	Rem	arks	
W.GLB   SW BH LOG (CP/RC)   K:\470607	Strike Depth	Casing Depth	Po	st	Post	Flow	Rem	arks	
AGS3_NEW.GLB   SW BH LOG (CP/RC)   KN47060785 - SEMMS\05.0 PROJECT INFORMATION\GINT\47060785-SEMMS.GPJ   AGS3_NEW.GDT   23/11/2011   10.26.23	Strike Depth	Casing Depth	Po	st	Post	Flow	Rem	arks	

	Method, Equipment and Remarks	
Method: CP		