

Appendix I. Bearing Piles Information

MILLER PILING LTD

Design Calculations for Bearing Pile Foundations

At
Millington Road,
Hayes

For
Kier Construction Newbury

Issue	Date	Description	By	Checked	Pages	Status
A	04/02/14	First Issue	BT	JH	1-30	APPROVAL
			SIGNED	SIGNED		
B	26/02/2014	Updated based upon full Endeavour Drilling Site Investigation.	BT	JH	1-30	APPROVAL
			SIGNED	SIGNED		
			SIGNED	SIGNED		



Miller Piling Ltd • 4 Elstree Way • Borehamwood • Hertfordshire • WD6 1RN

Tel: 0845 078 0321 • Fax: 020 8953 8747 • Web: www.millerpiling.ltd.uk • Email: info@millerpiling.ltd.uk

Company Registration No. 5392305

TABLE OF CONTENTS

1	DESIGN BRIEF
2	REFERENCED DOCUMENTS
3	GEOLOGICAL PROFILE
4	SOIL PARAMETERS
5	PILE SELECTION
6	PILE BEARING CAPACITY
7	PILE STRUCUTRAL DESIGN
8	WORKING TEST PILES
9	CONSTRUCTION DETAILS
10	ACTION REQUIRED FOR DESIGN REALISATION

APPENDICIES

A	SUBCONTRACTOR DESIGN RESPONSILBILTY MATRIX
B	BOREHOLE AND SOIL DESIGN PROFILE
C	PILE VERTICAL CAPACITY
D	WALLAP RUNS
E	PILE SECTION DESIGN
F	TEST PILE LAYOUT

1 DESIGN BRIEF

Miller Piling has been asked to prepare a design document for the bearing piles at Millington Road, Hayes for Kier Construction Newbury. The design herein has reviewed the piles in accordance with Miller Piling's 'Subcontractor Design Responsibility Matrix' (Appendix A).

The construction issue pile layout identifies the following pile loads these have been assessed within this document.

Pile SWL = 1200-2450kN

Pile Tension = None

Pile Shear = 50kN

The piles will be installed from the proposed basement of 27.50m OD. Boreholes were carried out from existing ground level of circa 32m OD.

2 REFERENCE DOCUMENTS

Specification: In accordance ICE SPREW, 2nd Edition

Site Investigation: By Sinclair Knight Merz

HPH4-6 dated October 2012

By Halcrow

GIB016-GEO-RPT-001 dated 15th March 2013

By Endeavour Drilling

Ref: END12-115, dated: September 2012

Relevant Drawings: By Halcrow Yolles

Pile Layout

110475-HYC-BD5-B2-DR-S-0198_C02

Piling Schedule

110475-HYC-BD5-B2-DR-S-0500_C02

Referenced Docs: BRE Special Digest 1 Concrete in Aggressive Ground - 3rd edition 2005

BS 8004 – Foundations : 1986

BS 8110 - Structural Use of Concrete : Part 1 : 1997

BS 8500 – Concrete : 2002

BS 8666 – Reinforcement for Concrete : 2005

BS EN 206 – Concrete : 2000

BS EN 1536 – Execution of geotechnical work – Bored piles : 1999

ICE Specification for Piling and Embedded Retaining Walls, 2nd Edition : 2007

LDSA Guidance Note for Bored Piles in London Clay 2009

3 GEOLOGICAL PROFILE

The following strata profile will be used within the design this has been based upon the ground profiles identified within the site investigations and soil strength profile (shown within Appendix B). We have assumed the ground conditions detailed within the site investigation are an accurate representation.

Groundwater was generally recorded between 29.6m OD and 14m OD in 4no. Boreholes and as such has been model at 27.0m OD for design purposes.

From (m OD)		Toe (m OD)	Stratum
32.00	-	30.00	Made Ground (Non-Cohesive)
30.00	-	27.50	Gravel (Non-Cohesive)
27.50	-	2.000	Clay (Cohesive)

4 SOIL PARAMETERS

Soil properties have been established from the test data where the relevant tests have been carried out as part of the site investigation works. In the absence of the necessary test data appropriate correlations have been used, a profile of soil strength to depth is shown in Appendix B. Note the parameters for the made ground have not been used in the assessment of the vertical capacity.

Stratum	Commencement Level (m OD)	Bulk Density, kN/m^3	SPT (N)	ϕ	C_u (kN/m^2)
Made Ground	32.00	18	5	28°	n/a
Gravel	30.00	20	40	38°	n/a
Clay	27.50	20	$17 + 1.09z$	24°	$84 + 5.47z$

The made ground and gravel have been ignored for the assessment of vertical and horizontal loading assessment. The start of the vertical load bearing strata has been taken as 24.5m OD ($C_u = 100\text{kN/m}^2$), for the lateral loading effect this has been taken as commencing at 27.00m OD, which is the typical COL.

5 PILE SELECTION

Given the general site and ground conditions present on this project rotary auger (RBA) bearing piles are considered appropriate. Temporary casing will be used to stabilise the bore through to the stable Clay strata. The substructure will need to accommodate for pile installation tolerances of 75mm in plane and 1/75 verticality. As noted previously the piles will be designed to accommodate an eccentric moment due to these requirements.

6 PILE BEARING CAPACITY

The axial capacity of 600mm diameter concrete piles is determined using the following capacity calculation, the design ground profile as presented in Appendix B and the geotechnical design parameters given in Section 4. The capacity output is presented in Appendix C.

The ultimate pile capacity, $Q_u = Q_{su} + Q_{bu} = t_{su} \cdot A_s + \sigma_{bu} \cdot A_b$

Where, t_{su} = Ultimate unit shaft resistance

σ_{bu} = Ultimate unit base resistance

A_s = Area of pile shaft in contact with the resisting ground

A_b = Area of pile base

In calculating the required pile lengths an overall design factor of safety = 2.2, with a minimum FOS = 1.2 on the pile shaft has been adopted. This FOS will require substantiation by the following testing regime which will require approval from the necessary authorities.

- 3no. working pile test to 1.5 x pile SWL

It has been assumed that all piles will be spaced at a minimum of 3.0 x pile diameter, and as such no group analysis is required.

We would recommend that all the bearing piles are integrity tested; this should be done from cut off level.

7 PILE STRUCTURAL DESIGN

7.1 Direct Stress

The maximum compression load has been limited to that which induces a stress in the pile section of $0.25 f_{cu}$, try C32/40 strength concrete

For 600mm diameter piles: 2827kN > Max SWL therefore O.K.

Therefore the minimum 28 day cube strength of pile concrete shall be 40N/mm^2 (C32/40).

7.2 Concrete Aggressivity Assessment

The Halcrow site investigation assessment suggests the design sulphate class for site is DS-2 and the aggressive chemical environment for concrete (ACEC) classification is AC-2. Based upon the BRE Digest (2005) gives a design class of DC-2.

7.3 Minimum Reinforcement

Main bars shall be a minimum of 0.5% A_c (BS EN 1536).

- For 600mm diameter piles 1414mm^2 – provide 6 x H 20 (1885mm^2)

7.4 Shear

The piles have been specified to resist a 50kN horizontal load. We have however assumed that any bending moments generated due to positional tolerances can be accommodated by the substructure in accordance with normal industry practice.

This has been analyzed using the WALLAP computer programme by Geosolve. This calculates the bending moment due to the lateral load, and where the bottom of the reinforcement should be. All piles are to be design to be able to move freely at the head of the pile. Therefore, the model will have a rotational stiffness of zero.

Analysis was carried out for the load cases detailed below this will generate the worst case design loading. The outputs from the lateral analysis are presented in Appendix D, and summarised below.

Load Case	Dia (mm)	Shear Load (kN)	Level of Bottom of reinforcement (m COL)	Unfactored Bending Moment (kNm)
1	600	50	4.0	29

The pile reinforcement has been assessed in accordance with BS8110: Part 1: 1997 using circular column design spreadsheets, moments and shear forces are multiplied by a partial load factor $\gamma_f = 1.4$ (BS 8110 Table 2.1 combination 2) details of the analysis can be found in appendix D and summarised below.

Load Case	Dia (mm)	Vertical Load, kN ($\gamma_f = 1.0$ – Comp)	Ult Shear Force (kN)	Ultimate Moment (kNm) ($\gamma_f = 1.5$)	Reinforcement
1	600	2450	75	44	6H20/H10@300c/c x 6m

7.5 Anchorage

BS8110 Table 3.27 – Longitudinal pile steel shall be carried into the pile cap a minimum distance of 38 bar diameters. For concrete strength class 28/35 and deformed type 2 reinforcement, the following tension anchorage/lap length is required.

- H20 = 760mm

The current engineers sub-structure will need to be reviewed to ensure it has sufficient depth to accommodate the anchorage requirements to satisfy the loading transfer mechanism to the pile.

Lastly, we would suggest the use of de-bonding foam to aid pile trimming.

8 WORKING TEST PILE

In order to substantiate design parameters and overall factors of safety it is required to carry out static load testing to the working piles as identified in section 6 of this document. Use tension pile to form the reaction load for the test, required no. and size of anchors required. Tension forces will be resisted by large diameter centralised steel reinforcements with bars joined using full strength couplers, $A_s = F_v \gamma_f \gamma_m / f_y$, where F_v = -Tensile Force, $\gamma_f = 1.4$, $\gamma_m = 1.15$, $f_y = 950 \text{ N/mm}^2$ (pre-stressing steel threadbar)

Working Load Tests						
Pile SWL (kN)	Pile Test Load, DVL (kN)	Max test Load (kN)	No. of Anchors	Load / Anchor (kN)	Anchor Length (m)	Required Tensile Steel
2450	2450	3675	4	920	16	1D40

From the above all test piles to have 4 anchor piles as reaction, these are to be installed as per NDT Ltd

layout number 4, see appendix D.

9 CONSTRUCTION DETAILS

Construct the piles in accordance with the Pile Construction Schedule, issued separately.

All piles with up to 2450kN compression load and 50kN shear load to be 600mm diameter CFA piles with 6H20/H10@300c/c x 6m

Bore the piles to the depth indicated or practical rig refusal. In the event of rig refusal, contact the pile designers.

Adopt Grade C32/40 concrete to Class DC-2, BRE SD1 (2005).

10 ACTION REQUIRED BY CLIENT FOR DESIGN REALISATION

Acceptance of this design and its associated qualifications

Issue revised construction status piling information, correcting pile COL.



APPENDIX A – SUBCONTRACTOR DESIGN RESPONSILBILTY MATRIX

SUBCONTRACTOR DESIGN RESPONSIBILITY MATRIX

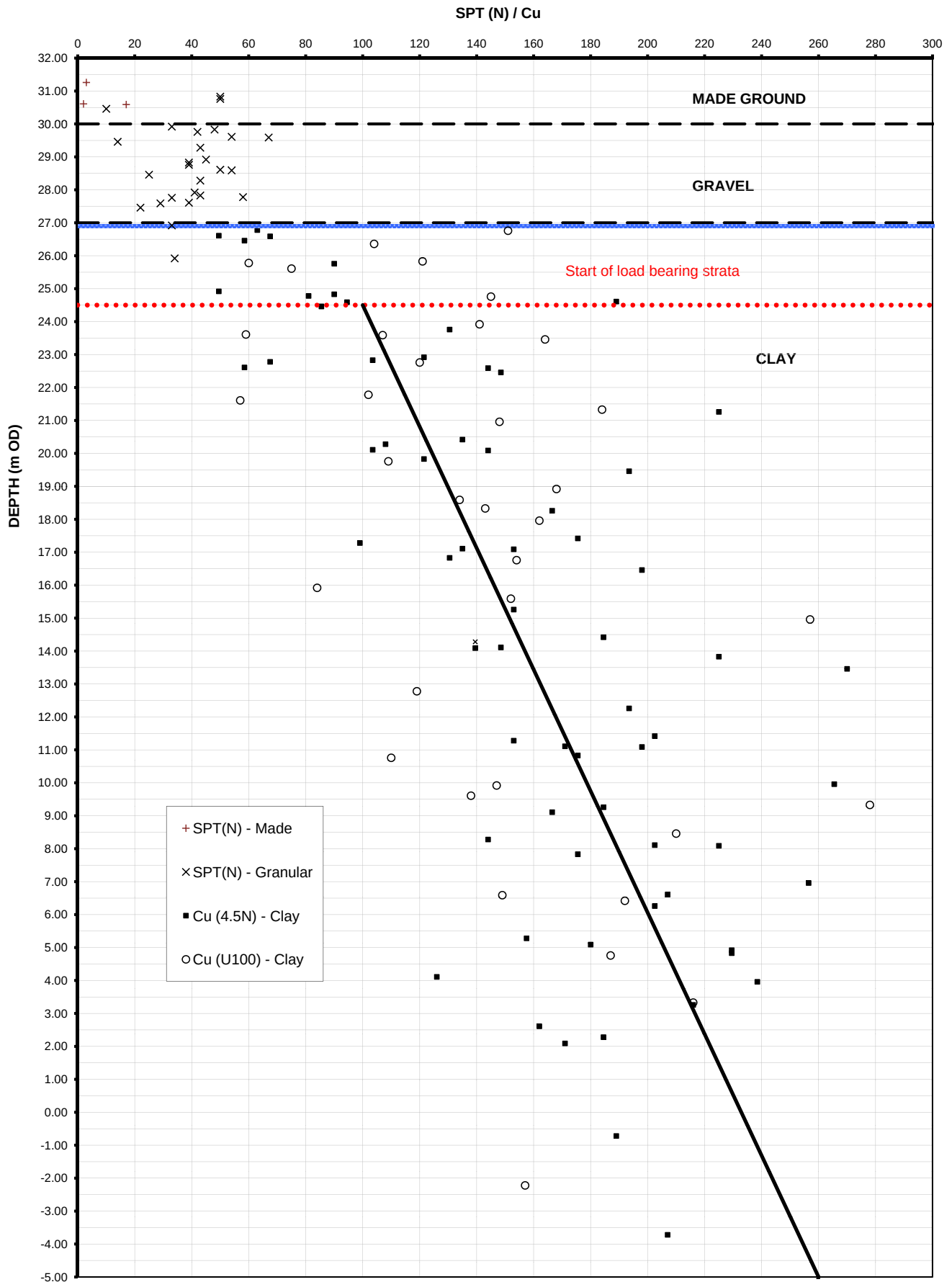
The key responsibilities for the provision and accuracy of information and/or performance criteria in relation to the PILE DESIGN are set out below.

REF	ITEM	COMPONENT	Contractor	Miller Piling Ltd
1	Site Investigation	Site constraints, planning and fire issues.	✓	✗
		Conditions of consents.	✓	✗
		Site information/records.	✓	✗
2	Geotechnical Reports	Design reports/test results/borehole reports	✓	✗
3	Construction Method	Specified Pile Type	✓	✗
4	Material Specification	Materials & Workmanship	✓	✗
5	Pile Location/Setting out	Drawings	✓	✗
		Sketches & Connection details	✓	✗
6	Bearing Piles - Performance Specification (Table B1.2 ICE SPERW 2 nd Edition)	Pile Ref, Location & COL	✓	✗
		Specified Working Loads (Compression, tension, shear and/or bending moments)	✓	✗
		Min Factor of Safety	✗	✓
		Design Verification Load	✗	✓
		Permitted Settlement at DVL	✓	✗
		Permitted Settlement at DVL + 0.5	✓	✗
		Minimum Pile Length	✗	✓
		Minimum Pile Diameter	✗	✓
7	Wall Elements - Performance Specification (Table B1.3 ICE SPERW 2 nd Edition)	Element ref, location & COL	✓	✗
		Maximum Excavation Level	✓	✗
		Temporary & Permanent conditions	✓	✗
		Construction Sequence	✗	✓
		Constraints to Wall	✓	✗
		Permitted Lateral Deflection	✓	✗
8	Installation Tolerances	As Table B1.4 (ICE SPERW 2 nd Edition)	✓	✗
9	Pile Schedule	Pile ref, diameters, length	✗	✓
10	Design Coordination & Management	Information management & timetable	✓	✗
11	Design Approval for Construction	Final design approvals	✓	✗

Table 1 – Design Responsibility

APPENDIX B – BOREHOLE AND SOIL DESIGN PROFILE

Contract Title:	Millington Road Hayes	Contract No:	9282	Sheet No.	
Element:	Bearing Piles	By:	BT	Date:	15/01/14



APPENDIX C – PILE VERTICAL CAPACITY

Contract Title:	Millington Road Hayes	Contract No:	9282	Sheet No:	
Element:	Bearing Piles	By:	BT	Date:	15/01/14

Soil Profile

Depth (m)	Soil Type	Density (kN/m³)	SPT (N)	Ks	Cu (kN/m²)	α	UCS (MN/m²)	Phi (°)	Shaft Limit	Base Limit
27.50	IGNORE	18.00								
24.50	COHESIVE	20.00			100	0.5				
-5.00	COHESIVE	20.00			260	0.5				

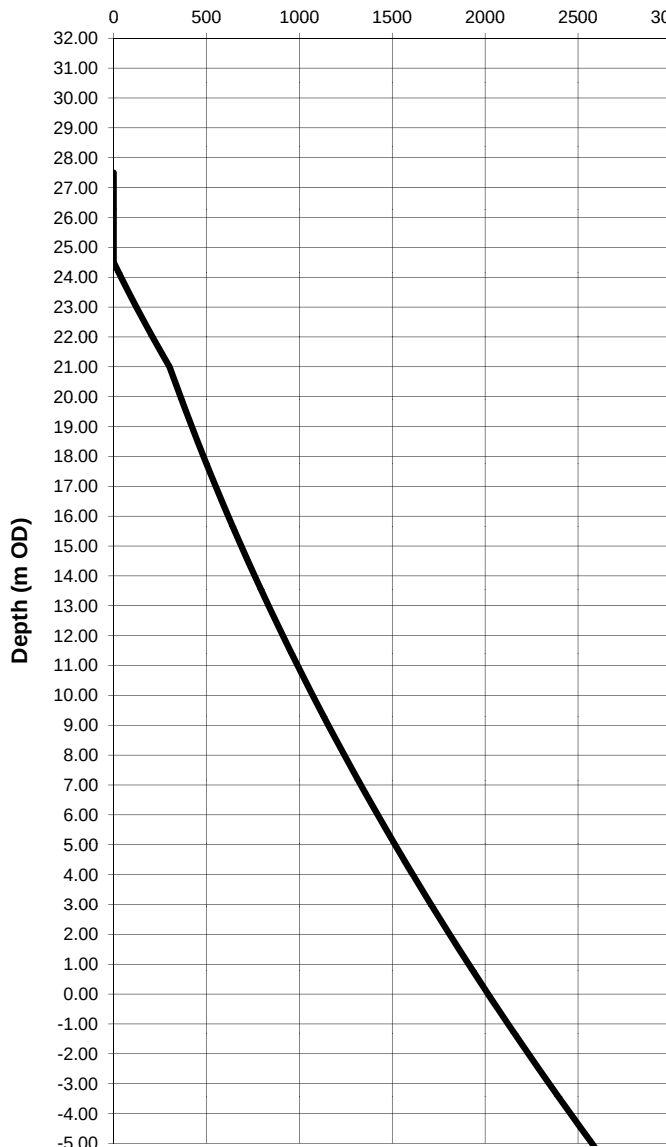
Groundwater **27.00**

Calculation Inc **0.50m**

Concrete **C40**

	DESIGN CASE 1	DESIGN CASE 2	DESIGN CASE 3	DESIGN CASE 4
Pile Diameter	600mm	Type	Type	Type
Pile Length	25.00m	Factor of Safety	Factor of Safety	Factor of Safety
Ult Shaft Capacity	3310kN	Shaft	0kN	Shaft
Ult Base Capacity	558kN	Base	0kN	Base
SWL	1758kN	Total	#DIV/0!	Total
Tension	1103kN	Max SWL	0kN	Max SWL

Load (kN)



Negative Skin Friction

- Negative Skin Friction is Calculated by the following

$$nsf = \bar{\sigma}' \cdot \beta$$

$$NSF = nsf \cdot A_s$$

$$\beta = \frac{0.3}{n/a}$$

$$\text{Depth of NSF occurs} = \frac{0.3}{n/a}$$

Basis Of Analysis

The Ultimate Skin Friction (Qs) is determined for each type of soil through which it the pile passes. The Ultimate End Bearing (Qb) is calculated on the basis of the soil parameters at the appropriate toe depth.

Separate Factors of Safety are applied to the total ultimate friction loads in each type of soil. The overall working load of the pile is the lesser of:

$$\frac{Q_s + Q_B}{F} \text{ or } \frac{Q_s}{F_s} + \frac{Q_B}{F_B} \text{ or } \frac{Q_s}{F_s}$$

Equations Used in the Calculations

- Granular Soils in accordance with Pile Design & Practice by MJ Tomlinson

$$q_s = K_s \cdot \bar{\sigma}' \cdot \tan \delta$$

$$q_B = \sigma' \cdot N_q$$

- Cohesive Soils in accordance with Cast in-situ bored piles in London Clay by Prof A.W. Skempton

$$q_s = \bar{C} \cdot u \cdot \alpha$$

$$q_B = C_u \cdot N_q$$

- Chalk Soils in accordance with CIRIA PR86

$$q_s = \beta \cdot \sigma', \text{ where } N \leq 10, \beta = 0.45, N > 10, \beta = 0.8$$

$$q_B = 200 \cdot N$$

- Rock in accordance with Pile Design & Practice by MJ Tomlinson & Rosenberg & Journeaux design curve.

$$q_s = \alpha_{rock} \cdot \bar{q}_{uc}$$

$$q_B = 2 \cdot N_\phi \cdot q_{uc}, \text{ where } N_\phi = \tan^2 \left(45 + \frac{\phi}{2} \right)$$

600mm

Contract Title:	Millington Road Hayes	Contract No.	9282	Sheet No.	
Element:	Bearing Piles	By	BT	Date	15/01/14

600mm Diameter, Overall FOS = 2.2

LEVEL	Effective Stress	SPT (N)	Phi (°)	Cu (kN/m ²)	Unit Shaft (qs) (kN/m ²)	Ultimate Shaft (Qs) (kN)	Unit End (qb) (kN/m ²)	Ultimate End (Qb) (kN)	SWL Comp (kN)	SWL Tension (kN)	Pile Length (m)
27.50	0.00	0	0	0	0	0	0	0	0	0	0.00
27.00	9.00	0	0	0	0	0	0	0	0	0	0.50
26.50	13.00	0	0	0	0	0	0	0	0	0	1.00
26.00	17.00	0	0	0	0	0	0	0	0	0	1.50
25.50	21.00	0	0	0	0	0	0	0	0	0	2.00
25.00	25.00	0	0	0	0	0	0	0	0	0	2.50
24.50	29.00	0	0	0	0	0	0	0	0	0	3.00
24.50	29.00	0	0	100	50	0	900	254	0	0	3.00
24.00	34.00	0	0	103	51	48	924	261	40	16	3.50
23.50	39.00	0	0	105	53	97	949	268	81	32	4.00
23.00	44.00	0	0	108	54	147	973	275	123	49	4.50
22.50	49.00	0	0	111	55	199	998	282	166	66	5.00
22.00	54.00	0	0	114	57	252	1022	289	210	84	5.50
21.50	59.00	0	0	116	58	306	1046	296	255	102	6.00
21.00	64.00	0	0	119	59	361	1071	303	301	120	6.50
20.50	69.00	0	0	122	61	418	1095	310	331	139	7.00
20.00	74.00	0	0	124	62	476	1120	317	360	159	7.50
19.50	79.00	0	0	127	64	535	1144	323	390	178	8.00
19.00	84.00	0	0	130	65	596	1168	330	421	199	8.50
18.50	89.00	0	0	133	66	657	1193	337	452	219	9.00
18.00	94.00	0	0	135	68	721	1217	344	484	240	9.50
17.50	99.00	0	0	138	69	785	1242	351	516	262	10.00
17.00	104.00	0	0	141	70	851	1266	358	549	284	10.50
16.50	109.00	0	0	143	72	918	1291	365	583	306	11.00
16.00	114.00	0	0	146	73	986	1315	372	617	329	11.50
15.50	119.00	0	0	149	74	1055	1339	379	652	352	12.00
15.00	124.00	0	0	152	76	1126	1364	386	687	375	12.50
14.50	129.00	0	0	154	77	1198	1388	392	723	399	13.00
14.00	134.00	0	0	157	78	1271	1413	399	759	424	13.50
13.50	139.00	0	0	160	80	1346	1437	406	796	449	14.00
13.00	144.00	0	0	162	81	1422	1461	413	834	474	14.50
12.50	149.00	0	0	165	83	1499	1486	420	872	500	15.00
12.00	154.00	0	0	168	84	1577	1510	427	911	526	15.50
11.50	159.00	0	0	171	85	1657	1535	434	950	552	16.00
11.00	164.00	0	0	173	87	1738	1559	441	990	579	16.50
10.50	169.00	0	0	176	88	1820	1583	448	1031	607	17.00
10.00	174.00	0	0	179	89	1904	1608	455	1072	635	17.50
9.50	179.00	0	0	181	91	1989	1632	461	1114	663	18.00
9.00	184.00	0	0	184	92	2075	1657	468	1156	692	18.50
8.50	189.00	0	0	187	93	2162	1681	475	1199	721	19.00
8.00	194.00	0	0	189	95	2251	1705	482	1242	750	19.50
7.50	199.00	0	0	192	96	2341	1730	489	1286	780	20.00
7.00	204.00	0	0	195	97	2432	1754	496	1331	811	20.50
6.50	209.00	0	0	198	99	2525	1779	503	1376	842	21.00
6.00	214.00	0	0	200	100	2618	1803	510	1422	873	21.50
5.50	219.00	0	0	203	102	2713	1827	517	1468	904	22.00
5.00	224.00	0	0	206	103	2810	1852	524	1515	937	22.50
4.50	229.00	0	0	208	104	2907	1876	531	1563	969	23.00
4.00	234.00	0	0	211	106	3006	1901	537	1611	1002	23.50
3.50	239.00	0	0	214	107	3106	1925	544	1659	1035	24.00

Contract Title:	Millington Road Hayes	Contract No.	9282	Sheet No.	
Element:	Bearing Piles	By	BT	Date	15/01/14

600mm Diameter, Overall FOS = 2.2

LEVEL	Effective Stress	SPT (N)	Phi (°)	Cu (kN/m ²)	Unit Shaft (qs) (kN/m ²)	Ultimate Shaft (Qs) (kN)	Unit End (qb) (kN/m ²)	Ultimate End (Qb) (kN)	SWL Comp (kN)	SWL Tension (kN)	Pile Length (m)
3.00	244.00	0	0	217	108	3208	1949	551	1709	1069	24.50
2.50	249.00	0	0	219	110	3310	1974	558	1758	1103	25.00
2.00	254.00	0	0	222	111	3414	1998	565	1809	1138	25.50
1.50	259.00	0	0	225	112	3520	2023	572	1860	1173	26.00
1.00	264.00	0	0	227	114	3626	2047	579	1911	1209	26.50
0.50	269.00	0	0	230	115	3734	2072	586	1964	1245	27.00
0.00	274.00	0	0	233	116	3843	2096	593	2016	1281	27.50
-0.50	279.00	0	0	236	118	3954	2120	600	2070	1318	28.00
-1.00	284.00	0	0	238	119	4065	2145	606	2123	1355	28.50
-1.50	289.00	0	0	241	121	4178	2169	613	2178	1393	29.00
-2.00	294.00	0	0	244	122	4292	2194	620	2233	1431	29.50
-2.50	299.00	0	0	246	123	4408	2218	627	2289	1469	30.00
-3.00	304.00	0	0	249	125	4525	2242	634	2345	1508	30.50
-3.50	309.00	0	0	252	126	4643	2267	641	2402	1548	31.00
-4.00	314.00	0	0	255	127	4762	2291	648	2459	1587	31.50
-4.50	319.00	0	0	257	129	4883	2316	655	2517	1628	32.00
-5.00	324.00	0	0	260	130	5005	2340	662	2576	1668	32.50
-5.00	324.00	0	0	260	130	5005	2340	662	2576	1668	32.50
-5.50	329.00	0	0	260	130	5127	2340	662	2631	1709	33.00
-6.00	334.00	0	0	260	130	5250	2340	662	2687	1750	33.50
-6.50	339.00	0	0	260	130	5372	2340	662	2743	1791	34.00
-7.00	344.00	0	0	260	130	5495	2340	662	2798	1832	34.50
-7.50	349.00	0	0	260	130	5617	2340	662	2827	1872	35.00

APPENDIX D – WALLAP RUNS

MILLER PILING LTD	Sheet No.
Program: WALLAP Version 6.05 Revision A45.B58.R48	Job No. 9283
Licensed from GEOSOLVE	Made by : BT
Data filename/Run ID: SHEAR_CHECK_SLS	
Hyde Park Hayes	Date: 26-02-2014
Shear Check	Checked :

Units: kN,m

INPUT DATA

SOIL PROFILE

Stratum no.	Elevation of top of stratum	Soil types
1	27.00	1 Clay

SOIL PROPERTIES

-- Soil type --	Bulk density	Young's Modulus	At rest coeff.	Consol state.	Active limit	Passive limit	Cohesion
No. Description (Datum elev.)	kN/m3	Eh, kN/m2	Ko	NC/OC	Ka	Kp	kN/m2
1 Clay	20.00	67200	1.000	OC	0.000	2.371	0.0d
(27.50)		(4376)		(0.200)	(0.000)	(3.080)	

Additional soil parameters associated with Ka and Kp

--- parameters for Ka ---			--- parameters for Kp ---		
Soil	Wall	Back-	Soil	Wall	Back-
friction	adhesion	fill	friction	adhesion	fill
angle	coeff.	angle	angle	coeff.	angle
1 Clay	0.00	0.000	0.00	24.00	0.000

GROUND WATER CONDITIONS

Density of water = 10.00 kN/m3

	Active side	Passive side
Initial water table elevation	27.00	27.00

Automatic water pressure balancing at toe of pile : No

PILE PROPERTIES

Type of structure = Single Pile

Pile diameter = 0.60 m

Elevation of toe of pile = 19.50

Maximum finite element length = 0.60 m

Pile diameter = 0.60 m

Youngs modulus of pile E = 1.9600E+07 kN/m2

Moment of inertia of pile I = 6.3617E-03 m4

E.I = 124689 kN.m2

Yield Moment of pile = Not defined

HORIZONTAL and MOMENT LOADS/RESTRAINTS

Load no.	Elevation	Horizontal load	Moment load	Moment restraint	Partial factor/Category
1	27.00	50.00	0	0	1.00 -

SURCHARGE LOADS

Surch-arge	Distance from wall	Length parallel to pile	Width perpend. to pile	Surcharge		Equiv. soil type	Partial factor/Category
no.	Elev.			Near edge	Far edge		
1	27.00	0.00(A)	20.00	20.00	15.00	=	N/A 1.00 -
2	27.00	-0.00(P)	20.00	20.00	15.00	=	N/A 1.00 -

Note: A = Active side, P = Passive side

Limit State Categories P/U = Permanent Unfavourable

P/F = Permanent Favourable

Var = Variable (unfavourable)

CONSTRUCTION STAGES

Construction stage no.	Stage description
1	Apply surcharge no.1 at elevation 27.00 No analysis at this stage
2	Apply surcharge no.2 at elevation 27.00
3	Apply load no.1 at elevation 27.00

FACTORS OF SAFETY and ANALYSIS OPTIONS

Limit State options: Serviceability Limit State
All loads and soil strengths are unfactored

Parameters for undrained strata:

Minimum equivalent fluid density = 5.00 kN/m3
Maximum depth of water filled tension crack = 0.00 m

Bending moment and displacement calculation:

Method - Subgrade reaction model using Influence Coefficients

OUTPUT OPTIONS

Stage no.	Stage description	Displacement	Active, Passive pressures	Graph. output
1	Apply surcharge no.1 at elev. 27.00	No	No	No
2	Apply surcharge no.2 at elev. 27.00	No	No	No
3	Apply load no.1 at elev. 27.00	Yes	Yes	Yes
*	Summary output	Yes	-	Yes

Program WALLAP - Copyright (C) 2013 by DL Borin, distributed by GEOSOLVE
69 Rodenhurst Road, London SW4, UK. Tel: +44 20 8674 7251

MILLER PILING LTD
 Program: WALLAP Version 6.05 Revision A45.B58.R48
 Licensed from GEOSOLVE
 Data filename/Run ID: SHEAR_CHECK_SLS
 Hyde Park Hayes
 Shear Check

Sheet No.
 Job No. 9283
 Made by : BT
 Date: 26-02-2014
 Checked :

Units: kN,m

Stage No. 3 Apply load no.1 at elevation 27.00

BENDING MOMENT and DISPLACEMENT ANALYSIS of Single Pile

Analysis options

Pile diameter = 0.60m

Subgrade reaction model - Boussinesq Influence coefficients

Soil deformations are elastic until the active or passive limit is reached

Rigid boundaries: Active side 20.00 from pile

Passive side 20.00 from pile

Limit State: Serviceability Limit State

Calculated Bending Moments and Strut Forces are to be multiplied by a factor of 1.35 to obtain values for structural design. See summary for factored values.

Node no.	Y coord	Nett pressure kN/m2	Pile disp. m	Pile rotation rad.	Shear force kN	Bending moment kN.m	Strut forces kN
1	27.00	-81.14	0.001	5.43E-04	50.0	-0.0	-50.0
2	26.40	-62.64	0.001	4.92E-04	24.1	21.0	
3	25.80	-45.02	0.000	3.73E-04	4.7	28.5	
4	25.20	-23.46	0.000	2.40E-04	-7.6	27.0	
5	24.60	-1.62	0.000	1.26E-04	-12.1	20.0	
6	24.00	6.49	-0.000	4.88E-05	-11.2	12.5	
7	23.40	8.89	-0.000	3.05E-06	-8.5	6.5	
8	22.80	8.27	-0.000	-1.82E-05	-5.4	2.4	
9	22.20	6.32	-0.000	-2.41E-05	-2.7	0.1	
10	21.60	4.11	-0.000	-2.21E-05	-0.9	-0.9	
11	21.00	2.14	-0.000	-1.75E-05	0.3	-1.0	
12	20.40	0.53	-0.000	-1.38E-05	0.7	-0.6	
13	19.95	-1.23	0.000	-1.23E-05	0.7	-0.2	
14	19.50	-3.59	0.000	-1.19E-05	0.0	0.0	

Node no.	Y coord	----- ACTIVE side -----					Total earth pressure kN/m2	Soil stiffness coeff. kN/m3
		Water press. kN/m2	Vertical kN/m2	Active limit kN/m2	Passive limit kN/m2	Earth pressure kN/m2		
1	27.00	0.00	15.00	0.00	106.70	0.00	0.00a	91085
2	26.40	6.00	21.00	0.00	149.37	0.00	6.00a	94532
3	25.80	12.00	26.99	0.00	191.98	0.00	12.00a	97979
4	25.20	18.00	32.96	0.00	234.48	10.01	28.01	101425
5	24.60	24.00	38.91	0.00	276.81	26.92	50.92	104872
6	24.00	30.00	44.83	0.00	318.93	36.96	66.96	75480
7	23.40	36.00	50.73	0.00	360.84	44.13	80.13	77882
8	22.80	42.00	56.58	0.00	402.52	49.78	91.78	80284
9	22.20	48.00	62.41	0.00	443.97	54.76	102.76	82686
10	21.60	54.00	68.21	0.00	485.21	59.61	113.61	85087
11	21.00	60.00	73.98	0.00	526.25	64.57	124.57	87489
12	20.40	66.00	79.72	0.00	567.11	69.69	135.69	89891
13	19.95	70.50	84.02	0.00	597.67	73.27	143.77	212352
14	19.50	75.00	88.30	0.00	628.15	76.53	151.53	216524

(continued)

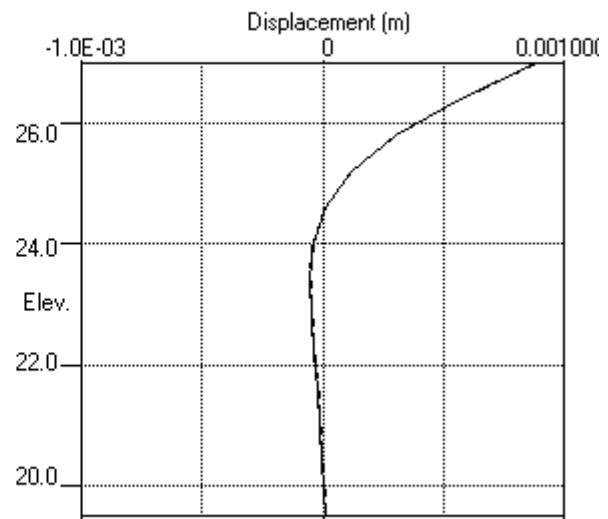
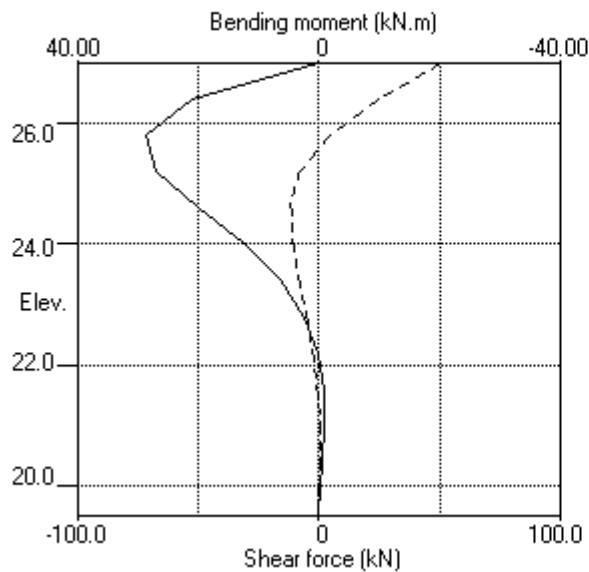
Stage No.3 Apply load no.1 at elevation 27.00

Node no.	Y coord	----- PASSIVE side -----						
		----- Effective stresses -----					Total earth pressure kN/m2	Soil stiffness coeff. kN/m3
		Water press. kN/m2	Vertic -al kN/m2	Active limit kN/m2	Passive limit kN/m2	Earth pressure kN/m2		
1	27.00	0.00	15.00	0.00	106.70	81.14	81.14	91085
2	26.40	6.00	21.00	0.00	149.37	62.64	68.64	94532
3	25.80	12.00	26.99	0.00	191.98	45.02	57.02	97979
4	25.20	18.00	32.96	0.00	234.48	33.47	51.47	101425
5	24.60	24.00	38.91	0.00	276.81	28.54	52.54	104872
6	24.00	30.00	44.83	0.00	318.93	30.46	60.46	75480
7	23.40	36.00	50.73	0.00	360.84	35.24	71.24	77882
8	22.80	42.00	56.58	0.00	402.52	41.51	83.51	80284
9	22.20	48.00	62.41	0.00	443.97	48.44	96.44	82686
10	21.60	54.00	68.21	0.00	485.21	55.50	109.50	85087
11	21.00	60.00	73.98	0.00	526.25	62.42	122.42	87489
12	20.40	66.00	79.72	0.00	567.11	69.17	135.17	89891
13	19.95	70.50	84.02	0.00	597.67	74.49	144.99	212352
14	19.50	75.00	88.30	0.00	628.15	80.12	155.12	216524

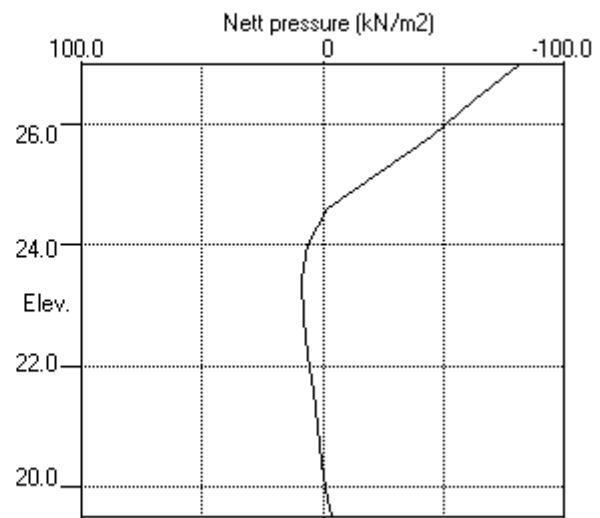
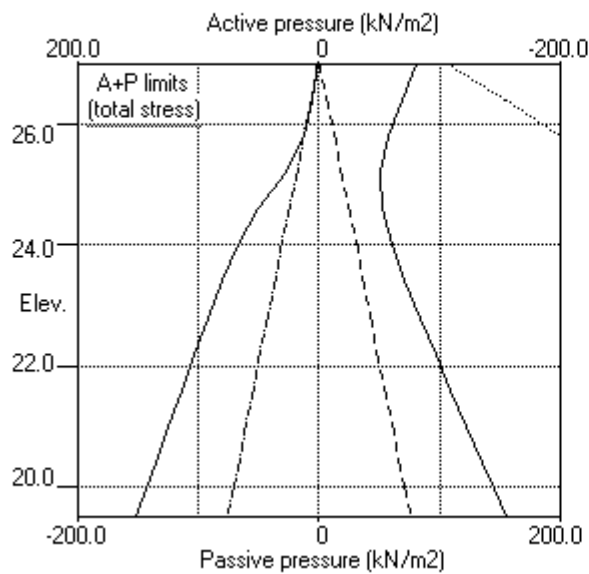
Note: 12.00a Soil pressure at active limit
 123.45p Soil pressure at passive limit

Units: kN,m

Stage No.3 Apply load no.1 at elev. 27.00



Stage No.3 Apply load no.1 at elev. 27.00



MILLER PILING LTD
Program: WALLAP Version 6.05 Revision A45.B58.R48
Licensed from GEOSOLVE
Data filename/Run ID: SHEAR_CHECK_SLS
Hyde Park Hayes
Shear Check

Sheet No.
Job No. 9283
Made by : BT
Date: 26-02-2014
Checked :

Units: kN,m

Summary of results

LIMIT STATE PARAMETERS

Limit State: Serviceability Limit State
All loads and soil strengths are unfactored

BENDING MOMENT and DISPLACEMENT ANALYSIS of Single Pile

Analysis options

Pile diameter = 0.60m

Subgrade reaction model - Boussinesq Influence coefficients

Soil deformations are elastic until the active or passive limit is reached

Rigid boundaries: Active side 20.00 from pile
Passive side 20.00 from pile

Limit State: Serviceability Limit State

Calculated Bending Moments and Strut Forces have been multiplied by a factor of 1.35 to obtain values for structural design.

Bending moment, shear force and displacement envelopes

Node no.	Y coord	Displacement		Bending moment				Shear force			
				Calculated		Factored		Calculated		Factored	
		max. m	min. m	max. kN.m	min. kN.m	max. kN.m	min. kN.m	max. kN	min. kN	max. kN	min. kN
1	27.00	0.001	0.000	0	-0	0	-0	50	0	68	0
2	26.40	0.001	0.000	21	0	28	0	24	0	33	0
3	25.80	0.000	0.000	29	0	38	0	5	0	6	0
4	25.20	0.000	0.000	27	0	37	0	0	-8	0	-10
5	24.60	0.000	0.000	20	0	27	0	0	-12	0	-16
6	24.00	0.000	-0.000	13	0	17	0	0	-11	0	-15
7	23.40	0.000	-0.000	6	0	9	0	0	-8	0	-11
8	22.80	0.000	-0.000	2	0	3	0	0	-5	0	-7
9	22.20	0.000	-0.000	0	0	0	0	0	-3	0	-4
10	21.60	0.000	-0.000	0	-1	0	-1	0	-1	0	-1
11	21.00	0.000	-0.000	0	-1	0	-1	0	-0	0	-0
12	20.40	0.000	-0.000	0	-1	0	-1	1	0	1	0
13	19.95	0.000	0.000	0	-0	0	-0	1	0	1	0
14	19.50	0.000	0.000	0	0	0	0	0	-0	0	-0

Maximum and minimum bending moment and shear force at each stage

Stage no.	Bending moment						Shear force					
	Calculated			Factored			Calculated			Factored		
	max.	elev.	min. elev.	max.	min.		max.	elev.	min. elev.	max.		
min.	kN.m		kN.m		kN.m	kN		kN		kN	kN	
1	0	25.80	-0	20.40	0	-0	0	26.40	-0	24.00	0	
-0												
2	0	25.80	-0	21.00	0	-0	0	26.40	-0	24.00	0	
-0												
3	29	25.80	-1	21.00	38	-1	50	27.00	-12	24.60	68	
-16												

Maximum and minimum displacement at each stage

Stage no.	Displacement				Stage description
	maximum m	elev.	minimum m	elev.	
1	0.000	27.00	0.000	27.00	Apply surcharge no.1 at elev. 27.00
2	0.000	27.00	-0.000	22.80	Apply surcharge no.2 at elev. 27.00
3	0.001	27.00	-0.000	23.40	Apply load no.1 at elev. 27.00

Run ID. SHEAR_CHECK_SLS
Hyde Park Hayes
Shear Check

| Sheet No.
| Date:26-02-2014
Checked :

Summary of results (continued)

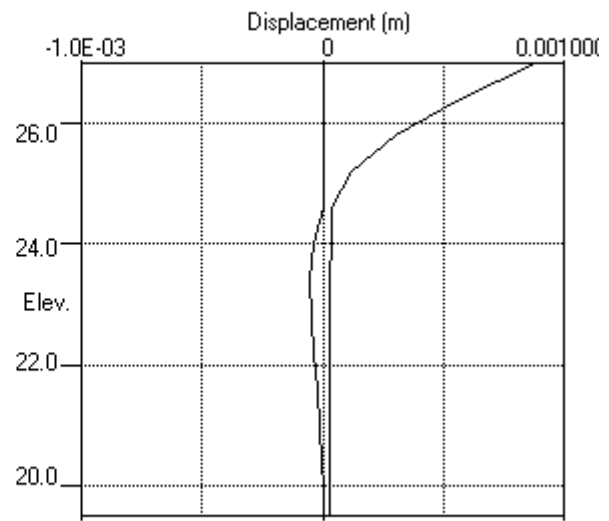
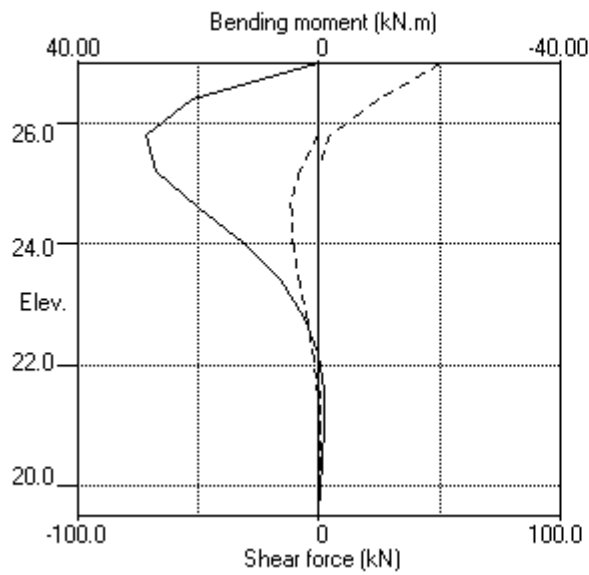
Calculated Bending Moments and Strut Forces have been multiplied by a factor of 1.35 to obtain values for structural design.

MILLER PILING LTD
Program: WALLAP Version 6.05 Revision A45.B58.R48
Licensed from GEOSOLVE
Data filename/Run ID: SHEAR_CHECK_SLS
Hyde Park Hayes
Shear Check

Sheet No.
Job No. 9283
Made by : BT
Date: 26-02-2014
Checked :

Units: kN,m

Bending moment, shear force, displacement envelopes



APPENDIX E – PILE SECTION DESIGN

Contract Title:	Millington Road Hayes	Contract No:	9282	Sheet No:	
Element:	Bearing Piles	By:	BT	Date:	15/01/14

Reinforcement Design

Calculate required reinforcement for the following design cases

Design Case	Ult Vertical kN	Ult Moment kNm	Ult Shear kN	Ult Tension kN
1	2450	44	75	

The following load factors have been used;

Compression	1.0
Moment	1.5

In Bending,

From circular column charting supply the steel based upon pile details below. See following page for circular column analysis

Design Case	Pile Dia (mm)	Cover (mm)	Concrete (N/mm ²)	Steel (N/mm ²)	Required Steel	Area of Steel (mm ²)	Length (m)
1	600	75	40	460	6 H 20	1885	6
0							
0							
0							
0							

In Shear,

Calculate the pile shear stress (V), and the pile shear strength (Vc) using the above pile parameters and the following equations. Pile effective depth and area based upon Clarke & Birjandi 'behaviour of reinforced circular sections'. Calculations assume a single circular / spiral link.

$$\text{Shear Strength, } V = V_{ult}/bvd$$

$$\text{Shear Strength, } v_c = 0.79/1.25 (100 \times A_s/bd)^{1/3} (f_{cu}/25)^{1/3}$$

Design Case	d (mm)	bd (mm ²)	V (N/mm ²)	Vc (N/mm ²)	Design Req'ment	Req'd Link (mm)	Sv (mm)	Installed Link (mm)
1	426	214920	0.349	0.562	Min Links	H 10	340.5	H10@300

Reinforcement Summary

Based upon the above supply the following cage(s) for the associated design cases.

Design Case	Required Cage
1	6H20/H10@300 x 6m

Project	Hyde park, Hayes			REINFORCED CONCRETE COUNCIL		
Client	Kier Construction			Made by	Date	Page
Location	Bearing Piles			JH	04-Feb-14	
COLUMN CHART FOR CIRCULAR COLUMNS TO BS 8110:1997				Checked	Revision	Job No
Originated from 'RCC54.xls' v2.1 on CD © 2001-2003 BCA for RCC					-	

MATERIALS

fcu

35

N/mm²

γm

1.05

steel

Cover

75

mm

fy

460

N/mm²

γm

1.5

concrete

h agg

20

mm

SECTION

600

mm

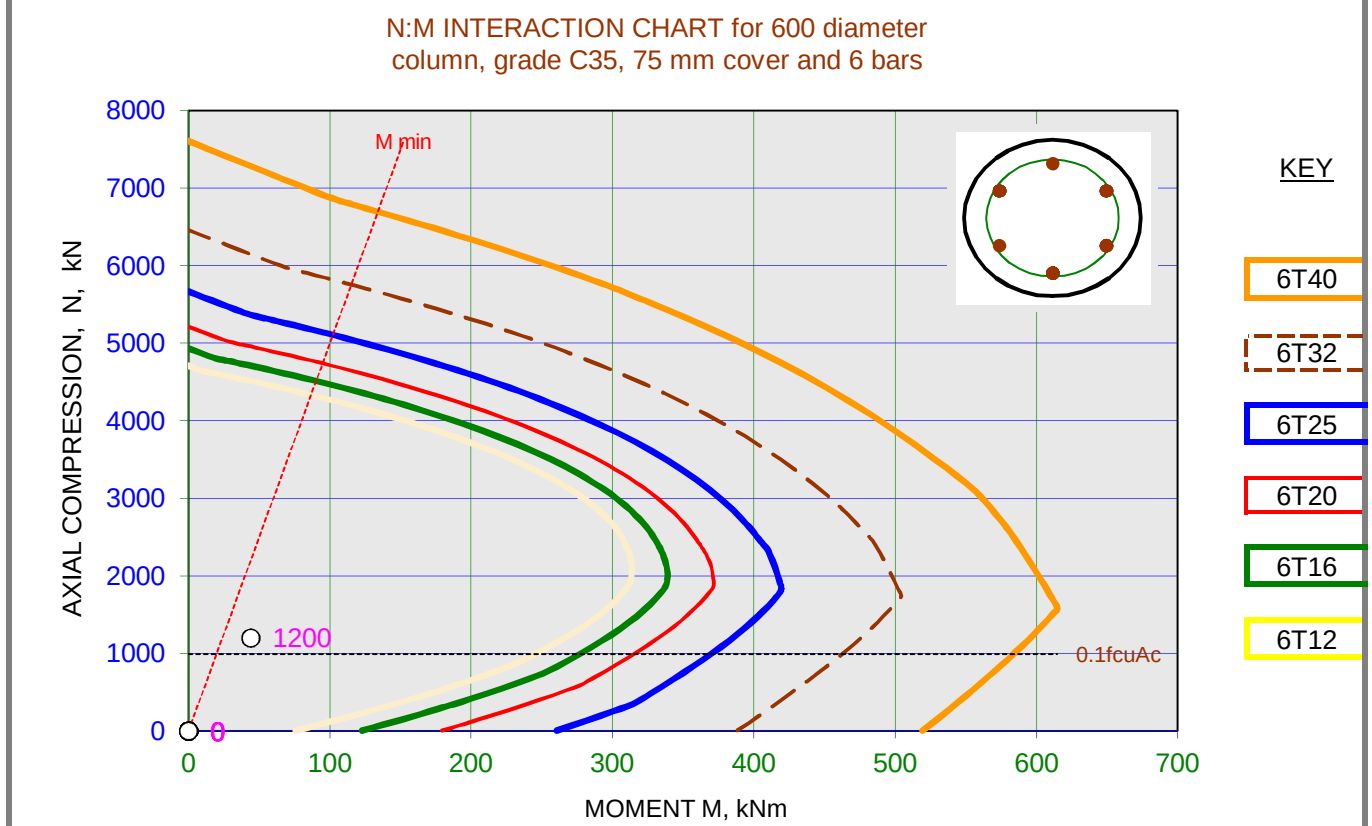
with

6

bars

BAR ARRANGEMENTS

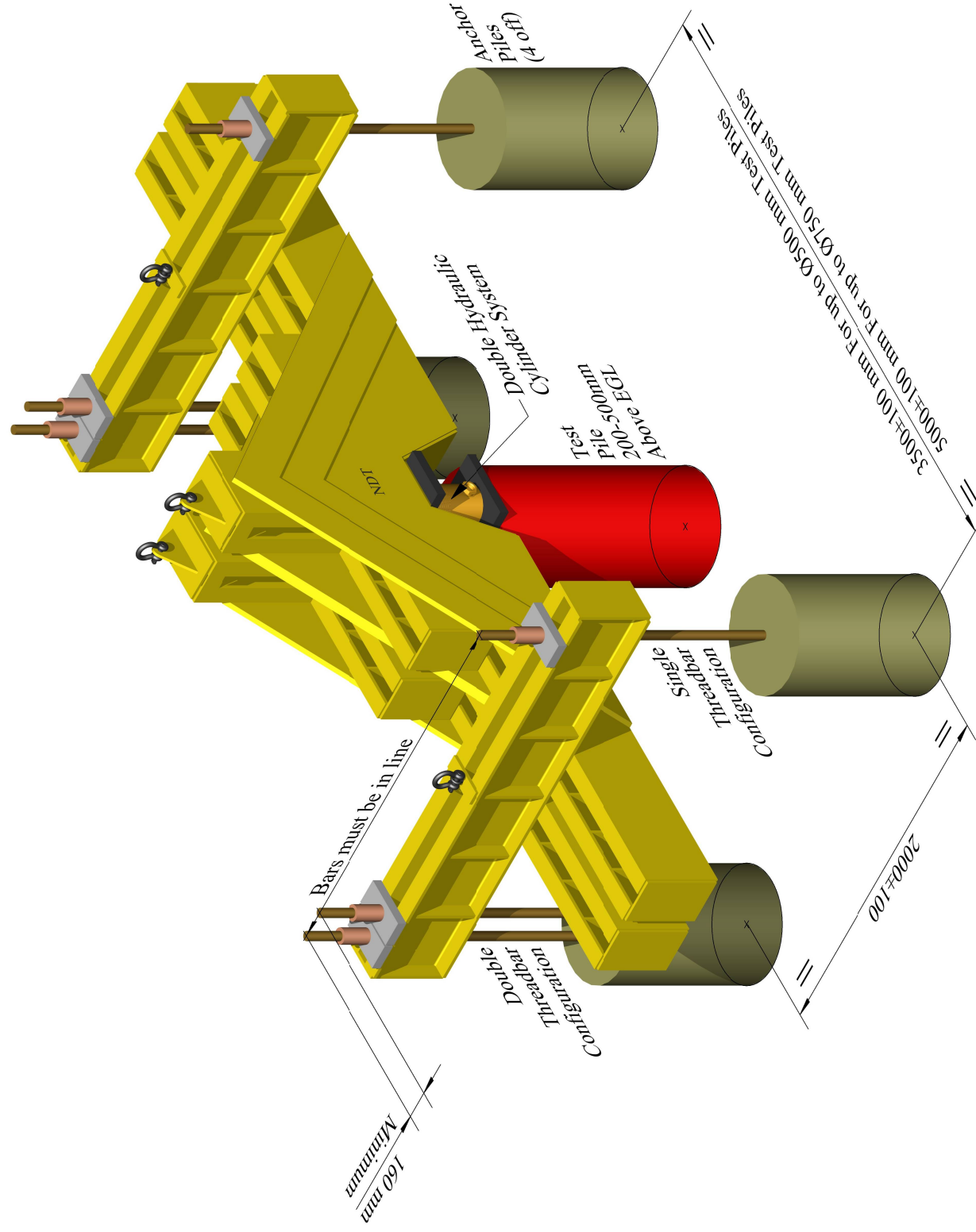
Type	Bar Ø	Asc %	Link Ø	Bar c/c	Nbal (kN)	Nuz (kN)	Checks
T	40	2.67	10	204.2	1573	7606	ok
T	32	1.71	8	210.5	1738	6459	ok
T	25	1.04	8	214.2	1828	5664	ok
T	20	0.67	6	218.9	1881	5217	ok
T	16	0.43	6	221.0	2028	4930	ok
T	12	0.00	6	223.1			ok



LOADCASES

Load case	N (kN)	M (kNm)		Load case	N (kN)	M (kNm)	
	1200	44	6 T12	4			No Fit
			No Fit	5			No Fit
			No Fit	6			No Fit

APPENDIX F – TEST PILE LAYOUT



Unit 32, Criffin Centre, Oxtou Road,
Epperstone, Nottingham NG14 6AT
Tel: 0115 9656610
Fax: 0115 9656611
Mobile: 07860 742479
E-mail: info@ndt-piletesting.com



Title: NDT 4, STANDARD 4000
MAX TEST LOAD 4000kN

Client: **GENERIC**

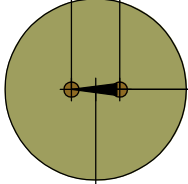
Drq No.	NDT000007
---------	-----------

Sheet 1 of 2 Revision A

—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
A	12/10/10	DP	AM	JP
REV	DATE	DRN	CHK	APP

Minimum
160 mm

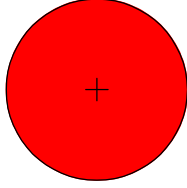
Double
Threadbar
Configuration



Bars must be in line

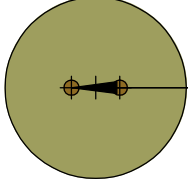
2000±100

Test
Pile
200-500mm
Above EGL

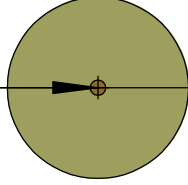


Bars must be in line

Anchor
Pile
(4 off)



Single
Threadbar
Configuration



3500±100 mm For up to Ø500 mm Test Piles

5000±100 mm For up to Ø750 mm Test Piles



ISO 9001:2008



012

Unit 32, Criffin Centre, Oxton Road,
Epperstone, Nottingham NG14 6AT

Tel: 0115 9656610

Fax: 0115 9656611

Mobile: 07860 742479

E-mail: info@ndt-piletesting.com



Title: NDT 4, STANDARD 4000
MAX TEST LOAD 4000kN

Client: GENERIC

Drg No. NDT00007

Sheet 2 of 2 Revision A

		MILLER PILING PILING SCHEDULE					Contract No: 9282		Refer to Drawing No: 110475-HYC-BD5-B2-DR-S-0500-C03				Page No.: SCHD/1 of 14			
							Rev	Comment					Date	Piling Requirements		
							A	First Issue					18/02/14	Concrete Grade 32/40		
		Site Address: Hyde Park, Millington Road Hayes UB3 4AZ					B	Tension load on Tower Crane revised					20/02/14	Concrete Class DC-2		
														Integrity Test 100%		
								Prelim Test Pile 0								
														Working Test Pile 3		
Block / Type	Pile No.	DIA (mm)	P.P.L (m OD)	COL (m OD)	Pile Length (m)	De-Bond Length (m) DIM 'A'	Depth of Cage from PPL (m)	Rebar DIM 'B'	Reinforcement	Cage Type	Concrete Volume	Engineer Sign Off	Comments	Loading (Comp/Tens/ Shear)	Rev	
WHERE PILE IS TO BE USED AS A TEST PILE, INSTALL CAGE TYPE 'B' INSTEAD OF 'A'																
Bearing	1	600	27.500	26.075	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50		
Bearing	2	600	27.500	26.075	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50		
Bearing	3	600	27.500	26.075	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50		
Bearing	4	600	27.500	26.075	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50		
Bearing	5	600	27.500	26.075	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50		
Bearing	6	600	27.500	26.075	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50		
Bearing	7	600	27.500	26.075	27.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.1			2000 / -- / 50		
Bearing	8	600	27.500	26.075	27.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.1			2000 / -- / 50		
Bearing	9	600	27.500	26.075	27.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.1			2000 / -- / 50		
Bearing	10	600	27.500	26.075	19.100	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50		
Bearing	11	600	27.500	26.075	27.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.1			2000 / -- / 50		
Bearing	12	600	27.500	26.075	19.100	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50		
Bearing	13	600	27.500	26.075	27.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.1			2000 / -- / 50		
Bearing	14	600	27.500	26.075	19.100	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50		
Bearing	15	600	27.500	26.075	27.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.1			2000 / -- / 50		
Bearing	16	600	27.500	26.075	19.100	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50		
Bearing	17	600	27.500	26.075	31.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	9.5			2500 / -- / 50		
Bearing	18	600	27.500	26.075	27.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.1			2000 / -- / 50		
Bearing	19	600	27.500	26.075	27.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.1			2000 / -- / 50		
Bearing	20	600	28.500	26.075	27.400	0.800	-1.4	N/A	6H20/H8@200c/c x 6m	A	8.1			2000 / -- / 50		
Bearing	21	600	28.500	26.075	27.400	0.800	-1.4	N/A	6H20/H8@200c/c x 6m	A	8.1			2000 / -- / 50		

		MILLER PILING PILING SCHEDULE					Contract No: 9282		Refer to Drawing No: 110475-HYC-BD5-B2-DR-S-0500-C03				Page No.: SCHD/2 of 14		
							Rev	Comment				Date	Piling Requirements		
		Site Address: Hyde Park, Millington Road Hayes UB3 4AZ					A	First Issue				18/02/14	Concrete Grade32/40		
							B	Tension load on Tower Crane revised				20/02/14	Concrete ClassDC-2		
													Integrity Test100%		
								Prelim Test Pile0							
												Working Test Pile3			
Block / Type	Pile No.	DIA (mm)	P.P.L (m OD)	COL (m OD)	Pile Length (m)	De-Bond Length (m) DIM 'A'	Depth of Cage from PPL (m)	Rebar DIM 'B'	Reinforcement	Cage Type	Concrete Volume	Engineer Sign Off	Comments	Loading (Comp/Tens/ Shear)	Rev
WHERE PILE IS TO BE USED AS A TEST PILE, INSTALL CAGE TYPE 'B' INSTEAD OF 'A'															
Bearing	22	600	28.500	26.075	19.100	0.800	-1.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50	
Bearing	23	600	28.500	26.075	19.100	0.800	-1.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50	
Bearing	24	600	28.500	26.075	19.100	0.800	-1.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50	
Bearing	25	600	28.500	26.075	19.100	0.800	-1.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50	
Bearing	26	600	28.500	26.075	19.100	0.800	-1.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50	
Bearing	27	600	28.500	26.075	19.100	0.800	-1.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50	
													Not Used		
Bearing	29	600	28.500	26.075	19.100	0.800	-1.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50	
Bearing	30	600	28.500	26.075	19.100	0.800	-1.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50	
Bearing	31	600	28.500	26.075	19.100	0.800	-1.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50	
Bearing	32	600	27.500	26.075	27.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.1			2000 / -- / 50	
Bearing	33	600	27.500	26.075	27.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.1			2000 / -- / 50	
Bearing	34	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	35	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	36	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	37	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	38	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	39	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	40	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	41	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	42	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	

		MILLER PILING PILING SCHEDULE					Contract No: 9282		Refer to Drawing No: 110475-HYC-BD5-B2-DR-S-0500-C03				Page No.: SCH/3 of 14		
							Rev	Comment				Date	Piling Requirements		
		Site Address: Hyde Park, Millington Road Hayes UB3 4AZ					A	First Issue				18/02/14	Concrete Grade32/40		
							B	Tension load on Tower Crane revised				20/02/14	Concrete ClassDC-2		
													Integrity Test100%		
								Prelim Test Pile0							
												Working Test Pile3			
Block / Type	Pile No.	DIA (mm)	P.P.L (m OD)	COL (m OD)	Pile Length (m)	De-Bond Length (m) DIM 'A'	Depth of Cage from PPL (m)	Rebar DIM 'B'	Reinforcement	Cage Type	Concrete Volume	Engineer Sign Off	Comments	Loading (Comp/Tens/ Shear)	Rev
WHERE PILE IS TO BE USED AS A TEST PILE, INSTALL CAGE TYPE 'B' INSTEAD OF 'A'															
Bearing	43	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	44	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	45	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	46	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	47	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	48	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	49	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	50	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	51	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	52	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	53	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	54	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	55	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	56	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	57	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	58	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	59	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	60	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	61	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	62	600	27.500	26.075	27.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.1			2000 / -- / 50	
Bearing	63	600	27.500	26.075	27.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.1			2000 / -- / 50	

		MILLER PILING PILING SCHEDULE					Contract No: 9282		Refer to Drawing No: 110475-HYC-BD5-B2-DR-S-0500-C03				Page No.: SCHD/4 of 14			
							Rev	Comment					Date	Piling Requirements		
							A	First Issue					18/02/14	Concrete Grade32/40		
		Site Address: Hyde Park, Millington Road Hayes UB3 4AZ					B	Tension load on Tower Crane revised					20/02/14	Concrete ClassDC-2		
														Integrity Test100%		
								Prelim Test Pile0								
													Working Test Pile3			
Block / Type	Pile No.	DIA (mm)	P.P.L (m OD)	COL (m OD)	Pile Length (m)	De-Bond Length (m) DIM 'A'	Depth of Cage from PPL (m)	Rebar DIM 'B'	Reinforcement	Cage Type	Concrete Volume	Engineer Sign Off	Comments	Loading (Comp/Tens/ Shear)	Rev	
WHERE PILE IS TO BE USED AS A TEST PILE, INSTALL CAGE TYPE 'B' INSTEAD OF 'A'																
Bearing	64	600	27.500	26.075	23.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.1			1650 / -- / 50		
Bearing	65	600	27.500	26.075	23.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.1			1650 / -- / 50		
Bearing	66	600	27.500	26.075	23.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.1			1650 / -- / 50		
Bearing	67	600	27.500	26.075	23.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.1			1650 / -- / 50		
Bearing	68	600	27.500	26.075	23.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.1			1650 / -- / 50		
Bearing	69	600	27.500	26.075	23.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.1			1650 / -- / 50		
Bearing	70	600	27.500	26.075	23.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.1			1650 / -- / 50		
Bearing	71	600	27.500	26.075	23.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.1			1650 / -- / 50		
Bearing	72	600	27.500	26.075	23.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.1			1650 / -- / 50		
Bearing	73	600	27.500	26.075	25.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.7			1850 / -- / 50		
Bearing	74	600	27.500	26.075	25.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.7			1850 / -- / 50		
Bearing	75	600	27.500	26.075	25.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.7			1850 / -- / 50		
Bearing	76	600	27.500	26.075	22.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.8			1550 / -- / 50		
Bearing	77	600	27.500	26.075	22.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.8			1550 / -- / 50		
Bearing	78	600	27.500	26.075	22.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.8			1550 / -- / 50		
Bearing	79	600	27.500	26.075	23.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.1			1650 / -- / 50		
Bearing	80	600	27.500	26.075	23.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.1			1650 / -- / 50		
Bearing	81	600	27.500	26.075	23.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.1			1650 / -- / 50		
Bearing	82	600	27.500	26.075	23.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.1			1650 / -- / 50		
Bearing	83	600	27.500	26.075	23.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.1			1650 / -- / 50		
Bearing	84	600	27.500	26.075	23.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.1			1650 / -- / 50		

		MILLER PILING PILING SCHEDULE					Contract No: 9282		Refer to Drawing No: 110475-HYC-BD5-B2-DR-S-0500-C03				Page No.: SCHD/5 of 14		
							Rev	Comment					Date	Piling Requirements	
		Site Address: Hyde Park, Millington Road Hayes UB3 4AZ					A	First Issue					18/02/14	Concrete Grade32/40	
							B	Tension load on Tower Crane revised					20/02/14	Concrete ClassDC-2	
														Integrity Test100%	
								Prelim Test Pile0							
													Working Test Pile3		
Block / Type	Pile No.	DIA (mm)	P.P.L (m OD)	COL (m OD)	Pile Length (m)	De-Bond Length (m) DIM 'A'	Depth of Cage from PPL (m)	Rebar DIM 'B'	Reinforcement	Cage Type	Concrete Volume	Engineer Sign Off	Comments	Loading (Comp/Tens/ Shear)	Rev
WHERE PILE IS TO BE USED AS A TEST PILE, INSTALL CAGE TYPE 'B' INSTEAD OF 'A'															
Bearing	85	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	86	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	87	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	88	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	89	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	90	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	91	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	92	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	93	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	94	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	95	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	96	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	97	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	98	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	99	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	100	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	101	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	102	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	103	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	104	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	105	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	

		MILLER PILING PILING SCHEDULE					Contract No: 9282		Refer to Drawing No: 110475-HYC-BD5-B2-DR-S-0500-C03				Page No.: SCH/6 of 14		
							Rev	Comment					Date	Piling Requirements	
		Site Address: Hyde Park, Millington Road Hayes UB3 4AZ					A	First Issue					18/02/14	Concrete Grade32/40	
							B	Tension load on Tower Crane revised					20/02/14	Concrete ClassDC-2	
														Integrity Test100%	
														Prelim Test Pile0	
														Working Test Pile3	
Block / Type	Pile No.	DIA (mm)	P.P.L (m OD)	COL (m OD)	Pile Length (m)	De-Bond Length (m) DIM 'A'	Depth of Cage from PPL (m)	Rebar DIM 'B'	Reinforcement	Cage Type	Concrete Volume	Engineer Sign Off	Comments	Loading (Comp/Tens/ Shear)	Rev
WHERE PILE IS TO BE USED AS A TEST PILE, INSTALL CAGE TYPE 'B' INSTEAD OF 'A'															
Bearing	106	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	107	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	108	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	109	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	110	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	111	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	112	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	113	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	114	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	115	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	116	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	117	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	118	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	119	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	120	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	121	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	122	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	123	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	124	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	125	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	126	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	

		MILLER PILING PILING SCHEDULE					Contract No: 9282		Refer to Drawing No: 110475-HYC-BD5-B2-DR-S-0500-C03				Page No.: SCHD/7 of 14		
							Rev	Comment				Date	Piling Requirements		
		Site Address: Hyde Park, Millington Road Hayes UB3 4AZ					A	First Issue				18/02/14	Concrete Grade32/40		
							B	Tension load on Tower Crane revised				20/02/14	Concrete ClassDC-2		
													Integrity Test100%		
											Prelim Test Pile0				
											Working Test Pile3				
Block / Type	Pile No.	DIA (mm)	P.P.L (m OD)	COL (m OD)	Pile Length (m)	De-Bond Length (m) DIM 'A'	Depth of Cage from PPL (m)	Rebar DIM 'B'	Reinforcement	Cage Type	Concrete Volume	Engineer Sign Off	Comments	Loading (Comp/Tens/ Shear)	Rev
WHERE PILE IS TO BE USED AS A TEST PILE, INSTALL CAGE TYPE 'B' INSTEAD OF 'A'															
Bearing	127	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	128	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	129	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	130	600	27.500	26.125	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	131	600	27.500	26.075	31.000	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	9.2			2400 / -- / 50	
Bearing	132	600	27.500	26.075	31.000	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	9.2			2400 / -- / 50	
Bearing	133	600	27.500	26.075	31.000	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	9.2			2400 / -- / 50	
Bearing	134	600	27.500	26.075	23.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.9			1600 / -- / 50	
Bearing	135	600	27.500	26.075	23.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.9			1600 / -- / 50	
Bearing	136	600	27.500	26.075	23.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.9			1600 / -- / 50	
Bearing	137	600	27.500	26.075	27.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.3			2050 / -- / 50	
Bearing	138	600	27.500	26.075	27.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.3			2050 / -- / 50	
Bearing	139	600	27.500	26.075	27.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.3			2050 / -- / 50	
Bearing	140	600	27.500	26.075	25.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.7			1850 / -- / 50	
Bearing	141	600	27.500	26.075	25.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.7			1850 / -- / 50	
Bearing	142	600	27.500	26.075	25.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.7			1850 / -- / 50	
Bearing	143	600	27.500	26.075	25.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.7			1850 / -- / 50	
Bearing	144	600	27.500	26.075	22.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.8			1550 / -- / 50	
Bearing	145	600	27.500	26.075	22.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.8			1550 / -- / 50	
Bearing	146	600	27.500	26.075	22.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.8			1550 / -- / 50	
TOWER CRANE	TC-147	600	27.500	0.000	16.300	1.000	-26.3	N/A	8H25/H8@200c/c x 15m	D	4.8			820 / 475 / 50	

		MILLER PILING PILING SCHEDULE					Contract No: 9282		Refer to Drawing No: 110475-HYC-BD5-B2-DR-S-0500-C03				Page No.: SCHD/8 of 14		
							Rev	Comment			Date	Piling Requirements			
		A	First Issue			18/02/14	Concrete Grade 32/40								
		B	Tension load on Tower Crane revised			20/02/14	Concrete Class DC-2								
							Integrity Test 100%								
Site Address: Hyde Park, Millington Road Hayes UB3 4AZ										Prelim Test Pile 0					
										Working Test Pile 3					
Block / Type	Pile No.	DIA (mm)	P.P.L (m OD)	COL (m OD)	Pile Length (m)	De-Bond Length (m) DIM 'A'	Depth of Cage from PPL (m)	Rebar DIM 'B'	Reinforcement	Cage Type	Concrete Volume	Engineer Sign Off	Comments	Loading (Comp/Tens/ Shear)	Rev
WHERE PILE IS TO BE USED AS A TEST PILE, INSTALL CAGE TYPE 'B' INSTEAD OF 'A'															
TOWER CRANE	TC-148	600	27.500	0.000	16.300	1.000	-26.3	N/A	8H25/H8@200c/c x 15m	D	4.8			820 / 475 / 50	
TOWER CRANE	TC-149	600	27.500	0.000	16.300	1.000	-26.3	N/A	8H25/H8@200c/c x 15m	D	4.8			820 / 475 / 50	
TOWER CRANE	TC-150	600	27.500	0.000	16.300	1.000	-26.3	N/A	8H25/H8@200c/c x 15m	D	4.8			820 / 475 / 50	
Bearing	151	600	27.500	26.075	26.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.0			1950 / -- / 50	
Bearing	152	600	27.500	26.075	26.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.0			1950 / -- / 50	
Bearing	153	600	27.500	26.075	26.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.0			1950 / -- / 50	
Bearing	154	600	27.500	26.075	19.600	0.800	-0.4	N/A	6H20/H8@200c/c x 15.5m	C	5.8			1250 / 525 / 50	
Bearing	155	600	27.500	26.075	19.600	0.800	-0.4	N/A	6H20/H8@200c/c x 15.5m	C	5.8			1250 / 525 / 50	
Bearing	156	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	157	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	158	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	159	600	27.500	26.075	23.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.9			1600 / -- / 50	
Bearing	160	600	27.500	26.075	23.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.9			1600 / -- / 50	
Bearing	161	600	27.500	26.075	23.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.9			1600 / -- / 50	
Bearing	162	600	27.500	26.075	23.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.9			1600 / -- / 50	
Bearing	163	600	27.500	26.075	23.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.9			1600 / -- / 50	
Bearing	164	600	27.500	26.075	26.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.0			1950 / -- / 50	
Bearing	165	600	27.500	26.075	26.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.0			1950 / -- / 50	
Bearing	166	600	27.500	26.075	26.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.0			1950 / -- / 50	
Bearing	167	600	27.500	26.075	23.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.9			1600 / -- / 50	
Bearing	168	600	27.500	26.075	28.300	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.4			2100 / -- / 50	

		MILLER PILING PILING SCHEDULE					Contract No: 9282		Refer to Drawing No: 110475-HYC-BD5-B2-DR-S-0500-C03				Page No.: SCHD/9 of 14		
							Rev	Comment				Date	Piling Requirements		
							A	First Issue				18/02/14	Concrete Grade 32/40		
		Site Address: Hyde Park, Millington Road Hayes UB3 4AZ					B	Tension load on Tower Crane revised				20/02/14	Concrete Class DC-2		
													Integrity Test 100%		
								Prelim Test Pile 0							
											Working Test Pile 3				
Block / Type	Pile No.	DIA (mm)	P.P.L (m OD)	COL (m OD)	Pile Length (m)	De-Bond Length (m) DIM 'A'	Depth of Cage from PPL (m)	Rebar DIM 'B'	Reinforcement	Cage Type	Concrete Volume	Engineer Sign Off	Comments	Loading (Comp/Tens/ Shear)	Rev
WHERE PILE IS TO BE USED AS A TEST PILE, INSTALL CAGE TYPE 'B' INSTEAD OF 'A'															
Bearing	169	600	27.500	26.075	28.300	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.4			2100 / -- / 50	
Bearing	170	600	27.500	26.075	28.300	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.4			2100 / -- / 50	
Bearing	171	600	27.500	26.075	23.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.9			1600 / -- / 50	
Bearing	172	600	27.500	26.075	23.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.9			1600 / -- / 50	
Bearing	173	600	27.500	26.075	23.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.9			1600 / -- / 50	
Bearing	174	600	27.500	26.075	27.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.3			2050 / -- / 50	
Bearing	175	600	27.500	26.075	27.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.3			2050 / -- / 50	
Bearing	176	600	27.500	26.075	27.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.3			2050 / -- / 50	
Bearing	177	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	178	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	179	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	180	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	181	600	27.500	26.075	23.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.1			1650 / -- / 50	
Bearing	182	600	27.500	26.075	23.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.1			1650 / -- / 50	
Bearing	183	600	27.500	26.075	23.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.1			1650 / -- / 50	
Bearing	184	600	27.500	26.075	23.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.9			1600 / -- / 50	
Bearing	185	600	27.500	26.075	27.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.3			2050 / -- / 50	
Bearing	186	600	27.500	26.075	27.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.3			2050 / -- / 50	
Bearing	187	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	188	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	189	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	

		MILLER PILING PILING SCHEDULE					Contract No: 9282		Refer to Drawing No: 110475-HYC-BD5-B2-DR-S-0500-C03				Page No.: SCHD/10 of 14		
							Rev	Comment					Date	Piling Requirements	
		Site Address: Hyde Park, Millington Road Hayes UB3 4AZ					A	First Issue					18/02/14	Concrete Grade32/40	
							B	Tension load on Tower Crane revised					20/02/14	Concrete ClassDC-2	
														Integrity Test100%	
								Prelim Test Pile0							
													Working Test Pile3		
Block / Type	Pile No.	DIA (mm)	P.P.L (m OD)	COL (m OD)	Pile Length (m)	De-Bond Length (m) DIM 'A'	Depth of Cage from PPL (m)	Rebar DIM 'B'	Reinforcement	Cage Type	Concrete Volume	Engineer Sign Off	Comments	Loading (Comp/Tens/ Shear)	Rev
WHERE PILE IS TO BE USED AS A TEST PILE, INSTALL CAGE TYPE 'B' INSTEAD OF 'A'															
Bearing	190	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	191	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	192	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	193	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	194	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	195	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	196	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	197	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	198	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	199	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	200	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	201	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	202	600	27.500	26.075	24.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.4			1750 / -- / 50	
Bearing	203	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	204	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	205	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	206	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	207	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	208	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	209	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	210	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	

		MILLER PILING PILING SCHEDULE					Contract No: 9282		Refer to Drawing No: 110475-HYC-BD5-B2-DR-S-0500-C03				Page No.: SCHD/11 of 14		
							Rev	Comment				Date	Piling Requirements		
							A	First Issue				18/02/14	Concrete Grade 32/40		
		Site Address: Hyde Park, Millington Road Hayes UB3 4AZ					B	Tension load on Tower Crane revised				20/02/14	Concrete Class DC-2		
													Integrity Test 100%		
								Prelim Test Pile 0							
											Working Test Pile 3				
Block / Type	Pile No.	DIA (mm)	P.P.L (m OD)	COL (m OD)	Pile Length (m)	De-Bond Length (m) DIM 'A'	Depth of Cage from PPL (m)	Rebar DIM 'B'	Reinforcement	Cage Type	Concrete Volume	Engineer Sign Off	Comments	Loading (Comp/Tens/ Shear)	Rev
WHERE PILE IS TO BE USED AS A TEST PILE, INSTALL CAGE TYPE 'B' INSTEAD OF 'A'															
Bearing	211	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	212	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	213	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	214	600	27.500	26.075	24.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	7.2			1700 / -- / 50	
Bearing	215	600	27.500	26.075	28.300	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.4			2100 / -- / 50	
Bearing	216	600	27.500	26.075	28.300	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.4			2100 / -- / 50	
Bearing	217	600	27.500	26.075	23.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.9			1600 / -- / 50	
Bearing	218	600	27.500	26.075	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	219	600	27.500	26.075	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	220	600	27.500	26.075	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	221	600	27.500	26.075	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	222	600	27.500	26.075	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	223	600	27.500	26.075	22.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	6.7			1500 / -- / 50	
Bearing	224	600	27.500	26.075	27.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.3			2050 / -- / 50	
Bearing	225	600	27.500	26.075	27.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.3			2050 / -- / 50	
Bearing	226	600	27.500	26.075	27.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.1			2000 / -- / 50	
Bearing	227	600	27.500	26.075	19.100	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50	
Bearing	228	600	27.500	26.075	27.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.1			2000 / -- / 50	
Bearing	229	600	27.500	26.075	19.100	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50	
Bearing	230	600	27.500	26.075	27.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.1			2000 / -- / 50	
Bearing	231	600	27.500	26.075	27.400	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.1			2000 / -- / 50	

		MILLER PILING PILING SCHEDULE					Contract No: 9282		Refer to Drawing No: 110475-HYC-BD5-B2-DR-S-0500-C03				Page No.: SCHD/12 of 14		
							Rev	Comment					Date	Piling Requirements	
		Site Address: Hyde Park, Millington Road Hayes UB3 4AZ					A	First Issue					18/02/14	Concrete Grade32/40	
							B	Tension load on Tower Crane revised					20/02/14	Concrete ClassDC-2	
														Integrity Test100%	
								Prelim Test Pile0							
														Working Test Pile3	
Block / Type	Pile No.	DIA (mm)	P.P.L (m OD)	COL (m OD)	Pile Length (m)	De-Bond Length (m) DIM 'A'	Depth of Cage from PPL (m)	Rebar DIM 'B'	Reinforcement	Cage Type	Concrete Volume	Engineer Sign Off	Comments	Loading (Comp/Tens/ Shear)	Rev
WHERE PILE IS TO BE USED AS A TEST PILE, INSTALL CAGE TYPE 'B' INSTEAD OF 'A'															
Bearing	232	600	27.500	26.075	19.100	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50	
Bearing	233	600	27.500	26.075	19.100	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50	
Bearing	234	600	27.500	26.075	31.500	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	9.4			2450 / -- / 50	
Bearing	235	600	27.500	26.075	27.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.3			2050 / -- / 50	
Bearing	236	600	27.500	26.075	27.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.3			2050 / -- / 50	
Bearing	237	600	27.500	26.075	27.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.3			2050 / -- / 50	
Bearing	238	600	27.500	26.075	27.900	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	8.3			2050 / -- / 50	
Bearing	239	600	27.500	26.075	19.100	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50	
Bearing	240	600	27.500	26.075	19.100	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50	
Bearing	241	600	27.500	26.075	19.100	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50	
Bearing	242	600	27.500	26.075	19.100	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50	
Bearing	243	600	27.500	26.075	19.100	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50	
Bearing	244	600	27.500	26.075	19.100	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50	
Bearing	245	600	27.500	26.075	19.100	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50	
Bearing	246	600	27.500	26.075	19.100	0.800	-0.4	N/A	6H20/H8@200c/c x 6m	A	5.7			1200 / -- / 50	
TEST PILE 1	ANC-1	600	27.500	N/A	16.000	N/A	N/A	N/A	1D40 x 16m	X	4.8			-- / 920 / --	
TEST PILE 1	ANC-2	600	27.500	N/A	16.000	N/A	N/A	N/A	1D40 x 16m	X	4.8			-- / 920 / --	
TEST PILE 1	ANC-3	600	27.500	N/A	16.000	N/A	N/A	N/A	1D40 x 16m	X	4.8			-- / 920 / --	
TEST PILE 1	ANC-4	600	27.500	N/A	16.000	N/A	N/A	N/A	1D40 x 16m	X	4.8			-- / 920 / --	
TEST PILE 2	ANC-5	600	27.500	N/A	16.000	N/A	N/A	N/A	1D40 x 16m	Y	4.8			-- / 920 / --	
TEST PILE 2	ANC-6	600	27.500	N/A	16.000	N/A	N/A	N/A	1D40 x 16m	Y	4.8			-- / 920 / --	

		MILLER PILING PILING SCHEDULE					Contract No: 9282		Refer to Drawing No: 110475-HYC-BD5-B2-DR-S-0500-C03				Page No.: SCHED/13 of 14			
							Rev	Comment					Date	Piling Requirements		
							A	First Issue					18/02/14	Concrete Grade32/40		
		Site Address: Hyde Park, Millington Road Hayes UB3 4AZ					B	Tension load on Tower Crane revised					20/02/14	Concrete ClassDC-2		
														Integrity Test100%		
														Prelim Test Pile0		
								Working Test Pile3								
Block / Type	Pile No.	DIA (mm)	P.P.L (m OD)	COL (m OD)	Pile Length (m)	De-Bond Length (m) DIM 'A'	Depth of Cage from PPL (m)	Rebar DIM 'B'	Reinforcement	Cage Type	Concrete Volume	Engineer Sign Off	Comments	Loading (Comp/Tens/ Shear)	Rev	
WHERE PILE IS TO BE USED AS A TEST PILE, INSTALL CAGE TYPE 'B' INSTEAD OF 'A'																
TEST PILE 2	ANC-7	600	27.500	N/A	16.000	N/A	N/A	N/A	1D40 x 16m	Y	4.8			-- / 920 / --		
TEST PILE 2	ANC-8	600	27.500	N/A	16.000	N/A	N/A	N/A	1D40 x 16m	Y	4.8			-- / 920 / --		
TEST PILE 3	ANC-9	600	27.500	N/A	16.000	N/A	N/A	N/A	1D40 x 16m	Z	4.8			-- / 920 / --		
TEST PILE 3	ANC-10	600	27.500	N/A	16.000	N/A	N/A	N/A	1D40 x 16m	Z	4.8			-- / 920 / --		
TEST PILE 3	ANC-11	600	27.500	N/A	16.000	N/A	N/A	N/A	1D40 x 16m	Z	4.8			-- / 920 / --		
TEST PILE 3	ANC-12	600	27.500	N/A	16.000	N/A	N/A	N/A	1D40 x 16m	Z	4.8			-- / 920 / --		



MILLER PILING
PILING SCHEDULE

Site Address:
Hyde Park, Millington Road
Hayes
UB3 4AZ

Contract No: 9282	Refer to Drawing No: 110475-HYC-BD5-B2-DR-S-0500-C03		Page No.: SCHED/
Rev	Comment	Date	Piling Requirements
A	First Issue	18/02/14	Concrete Grade 32/40
B	Tension load on Tower Crane revised	20/02/14	Concrete Class DC-2
			Integrity Test 100%
			Prelim Test Pile 0
			Working Test Pile 3

		CAGE SUMMARY							
Cage Type	Reinforcement	DIA (mm)	No.	DIM 'A' (m)	Projection (m)	Min of Pile Length (m)	Max of Pile Length (m)	Cage Weight (tn)	Concrete Volume (m3)
A	6H20/H8@200c/c x 6m	600	239	0.8	1	19.1	31.9	0.1054	1707.95
B	6H20/H8@200c/c x 9m	600	3	0.8	1.9	0	0	0.1581	N/A
C	6H20/H8@200c/c x 15.5m	600	2	0.8	1	19.6	19.6	0.2723	11.64
D	8H25/H8@200c/c x 15m	600	4	1	1.2	16.3	16.3	0.5040	19.36
X	1D40 x 16m	600	4	N/A	N/A	16	16	0.1634	19.00
Y	1D40 x 16m	600	4	N/A	N/A	16	16	0.1634	19.00
Z	1D40 x 16m	600	4	N/A	N/A	16	16	0.1634	19.00

TOTAL	257	30.082	1795.949
-------	-----	--------	----------

ORDER 3No. LESS TYPE 'A' CAGES DUE TO USE OF 3No. TYPE 'B' INSTEAD

Appendix J. Imported Topsoil Testing Results



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Mr Alan Morris
Charles Morris Fertilizers Ltd
Hythe End Farm
Hythe End Road
Wraysbury
Middlesex
TW19 5AW

1st June 2015

Our Ref: TOHA/15/6307/SS

Your Ref: as below

Dear Sirs

Soil Analysis Report: GP Soil

We have completed the analysis of the soil sample recently submitted, referenced *GP Soil*, and have pleasure reporting our findings.

The purpose of the analysis was to determine the suitability of the sample for general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Topsoil (*BS3882:2007 – Specification for topsoil and requirements for use – Table 1, Multipurpose Topsoil*).

This report presents the results of analysis for the sample submitted to our office, and it should be considered 'indicative' of the soil source. The report and results should therefore not be used by third parties as a means of verification or validation testing, especially after the soil has left the Charles Morris Fertilizers Ltd site.

SAMPLE EXAMINATION

The sample was described as a dark brown (Munsell colour: 7.5yr 3/4), slightly moist, friable SANDY LOAM with a weakly developed, fine granular structure*. The sample was virtually stone-free and contained occasional woody fragments and organic fines and very small fragments of brick. No unusual odours, roots or rhizomes of pernicious weeds were observed.

*This appraisal of soil structure was made from examination of a disturbed sample(s). Structure is a key soil characteristic that may only be accurately assessed by examination in an in-situ state.

Tim O'Hare Associates LLP
Howbery Park Wallingford Oxfordshire OX10 8BA
T:01491 822653 E:info@toha.co.uk
www.toha.co.uk

ANALYTICAL SCHEDULE

The sample was submitted to a UKAS and MCERTS accredited laboratory for a range of physical and chemical tests to confirm the composition and fertility of the soil, and the concentration of selected potential contaminants. The following parameters were determined:

- particle size analysis (sand, silt, clay);
- stone content (2-20mm, 20-50mm, >50mm);
- pH and electrical conductivity values;
- exchangeable sodium percentage;
- major plant nutrients (N, P, K, Mg);
- organic matter content;
- C:N ratio;
- heavy metals (As, B, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn);
- soluble sulphate, elemental sulphur, acid volatile sulphide;
- total cyanide and total (mono) phenols;
- speciated PAHs (US EPA16 suite);
- aromatic and aliphatic TPH (C5-C35 banding);
- benzene, toluene, ethylbenzene, xylene (BTEX);
- asbestos screen.

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

RESULTS OF ANALYSIS

Particle Size Analysis and Stone Content

The sample fell into the *loamy sand* texture class, which is usually considered suitable for general landscape applications provided the soil's physical condition is satisfactory.

The sample was virtually stone-free and as such, stones should not restrict the use of the soil for general landscape purposes.

pH and Electrical Conductivity Values

The sample was slightly acid in reaction (pH 6.9), with a pH value that would be considered ideal for general landscape purposes.

The electrical conductivity (salinity) value (water extract) was moderately high. Although the growth of many plant species (including amenity turf) are unlikely to be affected by this level of salinity, it is possible that salt sensitive species, including emergent seedlings, could show reduced growth potential.

The electrical conductivity value by CaSO₄ extract (BS3882 requirement) exceeded the maximum specified value (2800 µS/cm). Further testing found the sample to possess a low Exchangeable Sodium Percentage (ESP) value, indicating a low sodium risk and compliance with BS3882:2007 – Table 1 in this respect.

Organic Matter and Fertility Status

The sample was well supplied with organic matter and all major plant nutrients.

The C:N ratio was high (23:1) and exceeded the maximum upper limit set by BS3882:2007 - Table 1 (20:1). This could cause in 'nitrogen lock up' and result in growth restriction in sensitive plants in particular.

Potential Contaminants

With reference to BS3882:2007 - Table 1: Notes 2, 3 and 4, there is a requirement to confirm levels of potential contaminants in relation to the topsoil's proposed end use. This includes human health, environmental protection and metals considered toxic to plants. In the absence of site-specific criteria, the concentrations that affect human health have been assessed for *residential* end-use against the Suitable For Use Levels (S4ULs) presented in the LQM/CIEH S4ULs for Human Health Risk Assessment (2015) and the DEFRA SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document (2014).

Of the potential contaminants determined, none was found at levels that exceeded their guideline values.

Phytotoxic Contaminants

Of the phytotoxic (toxic to plants) contaminants determined (copper, nickel, zinc), none was found at levels that exceeded the maximum permissible levels specified in *BS3882:2007 – Table 1*.

CONCLUSION

The purpose of the analysis was to determine the suitability of the sample for general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Topsoil (*BS3882:2007 – Specification for topsoil and requirements for use – Table 1, Multipurpose Topsoil*).

From the soil examination and subsequent laboratory analysis, the sample was described as a slightly acidic, moderately saline loamy sand with a weakly developed structure and low stone content. The sample was adequately supplied with organic matter, and all major plant nutrients. Of the potential contaminants determined, none exceeded their respective guideline values.

To conclude, based on our findings, the topsoil represented by this sample would be considered suitable for general landscape purposes (trees, shrubs and amenity grass), provided the physical condition of the soil is maintained.

The topsoil was also largely compliant with the requirements of the British Standard for Topsoil (*BS3882:2007 – Specification for topsoil and requirements for use – Table 1, Multipurpose Topsoil*), with the exception of the slightly elevated C:N ratio.

On this occasion, this non-compliance is considered minor and insignificant when reviewed in the context of all the other results and considering the proposed end-use of this soil.

RECOMMENDATIONS

Soil Handling Recommendations

It is important to maintain the physical condition of the soil and avoid structural damage during all phases of soil handling (e.g. stockpiling, resspreading, cultivating, planting, seeding or turfing). As a consequence, soil handling operations should be carried out when soil is reasonably dry and non-plastic (friable) in consistency.

It is important to ensure that the soil is not unnecessarily compacted by trampling or trafficking by site machinery, and soil handling should be stopped during and after heavy rainfall and not continued until the soil is friable in consistency. If the soil is structurally damaged and compacted at any stage during the course of soiling or landscaping works, it should be cultivated appropriately to relieve the compaction and to restore the soil's structure prior to any planting, turfing or seeding.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if we can be of further assistance.

Yours faithfully

Iain Gould
BSc MSc PhD
Soil Scientist

Tim O'Hare
BSc MSc MScI SoilSci CSci MBIAC
Principal Consultant

For & on behalf of Tim O'Hare Associates LLP



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	Charles Morris Fertilizers Ltd
Project:	GP Soil
Job:	Topsoil Analysis - BS3882:2007
Date:	June 2015
Job Ref No:	TOHA/15/6307/SS

Sample Reference		Accreditation
Clay (<0.002mm)	%	UKAS
Silt (0.002-0.063mm)	%	UKAS
Sand (0.063-2.0mm)	%	UKAS
Texture Class (UK Classification)	-	UKAS
Stones (2-20mm)	% DW	GLP
Stones (20-50mm)	% DW	GLP
Stones (>50mm)	% DW	GLP

pH Value (1:2.5 water extract)	units	UKAS
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS
Electrical Conductivity (1:2 CaSO ₄ extract)	uS/cm	UKAS
Exchangeable Sodium Percentage	%	UKAS

Organic Matter (LOI)	%	UKAS
Total Nitrogen (Dumas)	%	UKAS
C : N Ratio	ratio	UKAS
Extractable Phosphorus	mg/l	UKAS
Extractable Potassium	mg/l	UKAS
Extractable Magnesium	mg/l	UKAS

Total Arsenic (As)	mg/kg	MCERTS
Total Cadmium (Cd)	mg/kg	MCERTS
Total Chromium (Cr)	mg/kg	MCERTS
Hexavalent Chromium (Cr VI)	mg/kg	MCERTS
Total Copper (Cu)	mg/kg	MCERTS
Total Lead (Pb)	mg/kg	MCERTS
Total Mercury (Hg)	mg/kg	MCERTS
Total Nickel (Ni)	mg/kg	MCERTS
Total Selenium (Se)	mg/kg	MCERTS
Total Zinc (Zn)	mg/kg	MCERTS
Water Soluble Boron (B)	mg/kg	MCERTS
Total Cyanide (CN)	mg/kg	MCERTS
Total (mono) Phenols	mg/kg	MCERTS
Elemental Sulphur (S)	mg/kg	MCERTS
Acid Volatile Sulphide (S)	mg/kg	MCERTS
Water Soluble Sulphate (SO ₄)	g/l	MCERTS

Naphthalene	mg/kg	MCERTS
Acenaphthylene	mg/kg	MCERTS
Acenaphthene	mg/kg	MCERTS
Fluorene	mg/kg	MCERTS
Phenanthrene	mg/kg	MCERTS
Anthracene	mg/kg	MCERTS
Fluoranthene	mg/kg	MCERTS
Pyrene	mg/kg	MCERTS
Benzo(a)anthracene	mg/kg	MCERTS
Chrysene	mg/kg	MCERTS
Benzo(b)fluoranthene	mg/kg	MCERTS
Benzo(k)fluoranthene	mg/kg	MCERTS
Benzo(a)pyrene	mg/kg	MCERTS
Indeno(1,2,3-cd)pyrene	mg/kg	MCERTS
Dibenzo(a,h)anthracene	mg/kg	MCERTS
Benzo(g,h,i)perylene	mg/kg	MCERTS
Total PAHs (sum USEPA16)	mg/kg	MCERTS

Aliphatic TPH >C5 - C6	mg/kg	MCERTS
Aliphatic TPH >C6 - C8	mg/kg	MCERTS
Aliphatic TPH >C8 - C10	mg/kg	MCERTS
Aliphatic TPH >C10 - C12	mg/kg	MCERTS
Aliphatic TPH >C12 - C16	mg/kg	MCERTS
Aliphatic TPH >C16 - C21	mg/kg	MCERTS
Aliphatic TPH >C21 - C35	mg/kg	MCERTS
Aliphatic TPH (C5 - C35)	mg/kg	MCERTS
Aromatic TPH >C5 - C7	mg/kg	MCERTS
Aromatic TPH >C7 - C8	mg/kg	MCERTS
Aromatic TPH >C8 - C10	mg/kg	MCERTS
Aromatic TPH >C10 - C12	mg/kg	MCERTS
Aromatic TPH >C12 - C16	mg/kg	MCERTS
Aromatic TPH >C16 - C21	mg/kg	MCERTS
Aromatic TPH >C21 - C35	mg/kg	MCERTS
Aromatic TPH (C5 - C35)	mg/kg	MCERTS

Benzene	mg/kg	MCERTS
Toluene	mg/kg	MCERTS
Ethylbenzene	mg/kg	MCERTS
p & m-xylene	mg/kg	MCERTS
o-xylene	mg/kg	MCERTS
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	MCERTS

Asbestos Screen	D/ND	ISO 17025
-----------------	------	-----------

LS = LOAMY SAND

Visual Examination

The sample was described as a dark brown (Munsell colour: 7.5yr 3/4), slightly moist, friable LOAMY SAND with a weakly developed, fine granular structure. The sample was virtually stone-free and contained occasional woody fragments and organic fines and very small fragments of brick. No unusual odours, roots or rhizomes of pernicious weeds were observed.

GP Soil

7
11
82
LS
3
1
0

6.9
1950
3296
3.2

8.7
0.22
23
57
324
187

4
< 0.2
8
< 4.0
9
72
1
3
< 1.0
52
0.9
< 1
< 1.0
< 20
< 1.0
1.30

0.08
0.18
0.19
0.34
2.6
0.6
3.9
3
1.6
1.4
1.5
1.1
1.4
0.68
0.14
0.8
19.5

< 0.1
< 0.1
< 0.1
< 1.0
< 2.0
< 8.0
12
12
< 0.1
< 0.1
< 0.1
< 1.0
< 2.0
< 10
< 10
< 10

< 0.001
< 0.001
< 0.001
< 0.001
< 0.001
< 0.001

Not-detected

Appendix K. Kier Verification Sampling in Soft Landscaping, 21 July 15

sample	depth (mm)	general description	notes	Sample / Depth (m)	Laboratory Analysis Results
VS04	100	Brown slightly clayey slightly gravelly uncompact SILT. Rare fine brick. (TOPSOIL)		VS04 ES 1 0.10	No Asbestos Identified in Sample
VS05	120	Brown slightly clayey slightly gravelly uncompact SILT. Rare fine brick. (TOPSOIL)		VS05 ES 1 0.12	No Asbestos Identified in Sample
VS06 ES1	80	Brown slightly clayey slightly gravelly uncompact SILT. Poss rare fine brick. (TOPSOIL)		VS06 ES 1 0.80	Amosite
VS06 ES2	350-450		Formation level sample. sampled with hand auger	VS06 ES 2 0.35	No Asbestos Identified in Sample
VS07	70	Brown slightly clayey slightly gravelly uncompact SILT. Rare fine brick. (TOPSOIL)		VS07 ES 1 0.07	Amosite
VS08 ES1	65	Brown slightly clayey slightly gravelly uncompact SILT. Rare fine brick. (TOPSOIL)		VS08 ES 1 0.065	Chrysotile
VS08 ES2	300	Brown gravelly uncompact SILT	Formation level sample. sampled with hand auger	VS08 ES 2 0.10	Chrysotile
VS09	125	Brown slightly clayey slightly gravelly uncompact SILT. Poss rare fine brick. (TOPSOIL)		VS09 ES 1 0.125	Chrysotile, Amosite
VS10	100	Brown slightly clayey slightly gravelly uncompact SILT. Poss rare fine brick. (TOPSOIL)		VS10 ES 1 0.10	No Asbestos Identified in Sample
VS11	150	Brown slightly clayey slightly gravelly uncompact SILT. Poss rare fine brick. (TOPSOIL)		VS11 ES 1 0.15	No Asbestos Identified in Sample
VS12	100	Brown slightly clayey slightly gravelly uncompact SILT. Poss rare fine brick. (TOPSOIL)		VS12 ES 1 0.10	Amosite
VS13 ES1	120	Dark brown silt slightly gravelly uncompact CLAY. Poss rare fine brick. (TOPSOIL)		VS13 ES 1 0.12	Chrysotile
VS13 ES2	300-380	Dark brown gravelly CLAY with yellow sand.	Formation level sample. sampled with hand auger	VS13 ES 2 0.30	Chrysotile
VS14	100	Brown slightly clayey slightly gravelly uncompact SILT. Poss rare fine brick. (TOPSOIL)		VS14 ES 1 0.10	Amosite
VS15	100	Brown slightly clayey slightly gravelly uncompact SILT. Poss rare fine brick. (TOPSOIL)		VS15 ES 1 0.10	Chrysotile
VS16	100	Brown slightly clayey slightly gravelly uncompact SILT. Poss rare fine brick. (TOPSOIL)		VS16 ES 1 0.10	No Asbestos Identified in Sample
VS17 ES1	100	Brown slightly clayey slightly gravelly uncompact SILT. Poss rare fine brick. (TOPSOIL)		VS17 ES 1 0.10	Chrysotile
VS17 ES2	360-450	Yellow brown slightly clayey gravelly SAND with occasional brick	Formation level sample. sampled with hand auger	VS17 ES 2 0.36	Chrysotile
VS18	90	Dark brown silty CLAY (TOPSOIL)		VS18 ES 1 0.10	No Asbestos Identified in Sample
VS19	100	Brown/ light brown silty gravelly CLAY. gravel of stone and occasional brick (TOPSOIL)	requested by Kier to compare new soil with existing soil	VS19 ES 1 0.10	No Asbestos Identified in Sample

Notes:

Sampling undertaken 21 July 15

disposable overalls and half-face P3 filter dust masks used by soil samplers

CAT used at each sampling location for service avoidance

arisings damped with water spray

disposable gloves changes and trowel cleaned between sampling locations

Our Ref: EFS/154911M (Ver. 4)

Your Ref: R5117

August 13, 2015



Environmental Chemistry

ESG

Bretby Business Park

Ashby Road

Burton-on-Trent

Staffordshire

DE15 0YZ

Telephone: 01283 554400

Facsimile: 01283 554422

Mr S Mason
ESG Wokingham
Glossop House
Hogwood Lane
Finchamstead
Wokingham
Berkshire
RG40 4QW

For the attention of Mr S Mason

Dear Mr Mason

Sample Analysis - Hyde Park, Hayes

Samples from the above site have been analysed in accordance with the schedule supplied.

The sample details and the results of analyses for these samples are given in the appended report.

An invoice for this work will follow under a separate cover.

Where appropriate the samples will be kept until 02/09/15 when they will be discarded. Please call 01283 554467 for an extension of this date.

Please be aware that our policy for the retention of paper based laboratory records and analysis reports is 6 years.

The work was carried out in accordance with Environmental Scientifics Group Ltd (Laboratory and Analytical) Standard Terms and Conditions of Contract.

If I can be of any further assistance please do not hesitate to contact me.

Yours sincerely

for ESG

L Thompson
Project Co-ordinator
01283 554467

TEST REPORT



Report No. EFS/154911M (Ver. 4)

ESG Wokingham
Glossop House
Hogwood Lane
Finchamstead
Wokingham
Berkshire
RG40 4QW

Site: Hyde Park, Hayes

The 20 samples described in this report were registered for analysis by ESG on 22-Jul-2015. This report supersedes any versions previously issued by the laboratory.

The analysis was completed by: 13-Aug-2015

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS or MCERTS accredited. Any opinions or interpretations expressed herein are outside the scope of any UKAS accreditation held by ESG.

The following tables are contained in this report:

Table 1 Main Analysis Results (Page 2)
Table of Asbestos Screening Results (Pages 3 to 5)
Analytical and Deviating Sample Overview (Pages 6 to 7)
Table of Method Descriptions (Page 8)
Table of Report Notes (Page 9)
Table of Sample Descriptions (Appendix A Page 1 of 1)

On behalf of
ESG :
Declan Burns

Managing Director
Multi-Sector Services

Date of Issue: 13-Aug-2015

Accreditation Codes: **N** (Not Accredited), **U** (UKAS), **UM** (UKAS & MCERTS)

Tests marked '*' have been subcontracted to another laboratory.

(NVM) - denotes the sample matrix is dissimilar to matrices upon which the MCERTS validation was based, and is therefore not accredited for MCERTS.

All results are reported on a dry weight basis at 105°C unless otherwise stated. (except QC samples)
ESG accepts no responsibility for any sampling not carried out by our personnel.

Units : Method Codes : Method Reporting Limits : Accreditation Code:					%	%	% M/M											
			Sub002a	Sub020	TMSS	LOI(%MM)	WSLM59											
					0.2	0.2	0.04											
			U	U	U	N	N											
LAB ID Number CL/	Client Sample Description	Sample Date	Asbestos Screen	Asbestos ID & Quan	Tot.Moisture @ 105C	L.O.I. % @ 450C	Total Organic Carbon											
1556011	VS04 ES 1 0.1	21-Jul-15	NAIIS		10.0	5.3	1.95											
1556012	VS05 ES 1 0.12	21-Jul-15	NAIIS		12.4	5.6	1.73											
1556013	VS06 ES 1 0.08	21-Jul-15	AM	NADIS	10.8	9.1	1.91											
1556014	VS07 ES 1 0.07	21-Jul-15	AM	NADIS	10.7	5.8	2.06											
1556015	VS08 ES 1 0.065	21-Jul-15	CH	0.005	9.8	5.6	2.12											
1556016	VS09 ES 1 0.125	21-Jul-15	CH AM	NADIS	10.6	5.3	2.09											
1556017	VS10 ES 1 0.1	21-Jul-15	NAIIS		12.0	4.5	1.85											
1556018	VS12 ES 1 0.1	21-Jul-15	AM	NADIS	10.3	6.4	2.35											
1556019	VS13 ES 1 0.12	21-Jul-15	CH	NADIS	18.7	5.0	1.83											
1556020	VS14 ES 1 0.1	21-Jul-15	AM	NADIS	11.0	5.0	1.74											
1556021	VS15 ES 1 0.1	21-Jul-15	CH	NADIS	17.1	5.2	1.88											
1556022	VS16 ES 1 0.1	21-Jul-15	NAIIS		17.9	5.1	2.10											
1556023	VS17 ES 1 0.1	21-Jul-15	CH	NADIS	20.6	6.9	2.66											
1556024	VS18 ES 1 0.1	21-Jul-15	NAIIS		18.0	6.9	2.59											
1556025	VS19 ES 1 0.1	21-Jul-15	NAIIS		6.4	4.0	1.42											
1556026	VS11 ES 1 0.15	21-Jul-15	NAIIS		12.5	4.9	1.81											
1556027	VS06 ES 2 0.35	21-Jul-15	NAIIS		15.8													
1556028	VS08 ES 2 0.3	21-Jul-15	CH		6.8													
1556029	VS13 ES 2 0.3	21-Jul-15	CH		16.8													
1556030	VS17 ES 2 0.36	21-Jul-15	CH		14.4													
 Bretby Business Park, Ashby Road Burton-on-Trent, Staffordshire, DE15 0YZ Tel +44 (0) 1283 554400 Fax +44 (0) 1283 554422			Client Name		ESG Wokingham						Sample Analysis							
			Contact		Mr S Mason						Date Printed		13-Aug-2015					
			Hyde Park, Hayes								Report Number		EFS/154911M					
											Table Number		1					

CERTIFICATE OF ANALYSIS

ANALYSIS REQUESTED BY: ESG Environmental Chemistry
PO Box 100
Burton upon Trent
Staffordshire
DE15 0XD

CONTRACT NO: 44784-1

PROJECT NO: 610

DATE OF ISSUE: 07.08.15

DATE SAMPLES RECEIVED: 31.07.15

DATE SAMPLES ANALYSED: 07.08.15

SAMPLE DESCRIPTION: Nine soil/loose aggregate samples each weighing approximately 0.3-0.6kg

ANALYSIS REQUESTED: Qualitative and quantitative analysis of soil/loose aggregate samples for mass determination of asbestos.

METHODS:

Qualitative - The samples were analysed qualitatively for asbestos by polarised light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative - The analysis was carried out using our documented in-house method based on HSE Contract Research Report No. 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies *et al*, 1996) and HSG 248. Our method includes initial examination of the entire sample, detailed analysis of a representative sub-sample and quantification by hand picking/weighing and/or fibre counting/sizing as appropriate.

RESULTS:

Initial Screening

Asbestos was detected in one of the nine soil samples by stereo-binocular and polarised light microscopy.

A summary of the qualitative and quantitative results are given in Tables 1 & 2 respectively.



CONTRACT NO: 44784-1
PROJECT NO: 610
DATE OF ISSUE: 07.08.15

RESULTS: (cont.)

Table 1: Qualitative Results

ESG Job I.D: S154911

IOM sample number	Client sample number	ACM type detected	PLM result
S35238	S1556013 VS06 0.08	-	No Asbestos Detected
S35239	S1556014 VS07 0.07	-	No Asbestos Detected
S35240	S1556015 VS08 0.065	Free Fibres	Amosite
S35241	S1556016 VS09 0.125	-	No Asbestos Detected
S35242	S1556018 VS12 0.1	-	No Asbestos Detected
S35243	S1556019 VS13 0.12	-	No Asbestos Detected
S35244	S1556020 VS14 0.1	-	No Asbestos Detected
S35245	S1556021 VS15 0.1	-	No Asbestos Detected
S35246	S1556023 VS17 0.1	-	No Asbestos Detected

Our detection limit for this method is 0.001%.

Table 2: Quantitative Analysis Results

Client Sample Number	Sample Weight (g)	% Asbestos in Sample from ACM's	% Asbestos in Sample as Unbound Fibres	Total % Asbestos in Sample
S1556015 VS08 0.65	455	-	0.005	0.005

-not applicable

Our limit of quantification for gravimetric analysis of soil samples is 0.001%.

The detection limit for fibre counting/sizing is around 0.0001% with a limit of quantification of 0.001%.

COMMENTS:

IOM Consulting cannot accept responsibility for samples that have been incorrectly collected or despatched by external clients.

Any opinions and interpretations expressed herein are outwith the scope of our UKAS accreditation.

Julie Simpson

AUTHORISED BY:

J Simpson
Senior Scientific Technician

			ASBESTOS ANALYSIS RESULTS - SOIL ANALYSIS							Detection limit of Method SCI-ASB-020 is 0.001%		
			ESG Asbestos Limited Certificate of Analysis for Asbestos in Soils							Sampling has been carried out by a third party		
Client:			ESG Environmental Chemistry						Page 1 of 1			
Address:			Etwall House, Bretby Business Park, Ashby Road, Burton upon Trent						Report No: ANO-0488-10639			
For the attention of:			ESG Wokingham						Report Date: 24/07/2015			
Site Address:			Hyde Park, Hayes						Project Number: S154911			
Sample Number	Sample Date	Sample Location	Test Date	Total Sample Dry Weight (g)	Weight of <2mm Fraction (g)	Asbestos(g) in >8mm+>2mm	Asbestos(g) in <2mm	% Asbestos by weight of Total Dried Sample	Asbestos Fibre Types Identified			
CL/1556011	21/07/15	VS04 0.1	24/07/2015					Screen Only	NAIIS			
CL/1556012	21/07/15	VS05 0.12	24/07/2015					Screen Only	NAIIS			
CL/1556013	21/07/15	VS06 0.08	24/07/2015					Screen & ID	Amosite(Free Fibres)			
CL/1556014	21/07/15	VS07 0.07	24/07/2015					Screen & ID	Amosite(Free Fibres)			
CL/1556015	21/07/15	VS08 0.065	24/07/2015					Screen & ID	Chrysotile(Free Fibres)			
CL/1556016	21/07/15	VS09 0.125	24/07/2015					Screen & ID	Amosite,Chrysotile(Lagging)			
CL/1556017	21/07/15	VS10 0.1	24/07/2015					Screen Only	NAIIS			
CL/1556018	21/07/15	VS12 0.1	24/07/2015					Screen & ID	Amosite(Free Fibres)			
CL/1556019	21/07/15	VS13 0.12	24/07/2015					Screen & ID	Chrysotile(Free Fibres)			
CL/1556020	21/07/15	VS14 0.1	24/07/2015					Screen & ID	Amosite(Free Fibres)			
CL/1556021	21/07/15	VS15 0.1	24/07/2015					Screen & ID	Chrysotile(Free Fibres)			
CL/1556022	21/07/15	VS16 0.1	24/07/2015					Screen Only	NAIIS			
CL/1556023	21/07/15	VS17 0.1	24/07/2015					Screen & ID	Chrysotile(Free Fibres)			
CL/1556024	21/07/15	VS18 0.1	24/07/2015					Screen Only	NAIIS			
CL/1556025	21/07/15	VS19 0.1	24/07/2015					Screen Only	NAIIS			
CL/1556026	21/07/15	VS11 0.15	24/07/2015					Screen Only	NAIIS			
CL/1556027	21/07/15	VS06 0.35-0.45	24/07/2015					Screen Only	NAIIS			
CL/1556028	21/07/15	VS08 0.3	24/07/2015					Screen & ID	Chrysotile(Free Fibres)			
CL/1556029	21/07/15	VS13 0.3-0.38	24/07/2015					Screen & ID	Chrysotile(Free Fibres)			
CL/1556030	21/07/15	VS17 0.36-0.45	24/07/2015					Screen & ID	Chrysotile(Free Fibres)			
Keys		NAACR = Not Analysed at Clients Request			NAIIS = No Asbestos Identified in Sample (Screens Only)				Name:		Stacey Innes	Authorised Signatory:
		* visible to naked eye			NADIS = No Asbestos Detected in Sample (ID & Quant Only)				Position:		Lab Analyst	
The sample analysis for the above results was carried out using the procedures detailed in ESG Asbestos Limited in house method (SCI-ASB-020) based on HSE document MDHS 90 - Asbestos Contaminated Land - Draft 5 - November 1997 (withdrawn). Fibre identification was carried out using ESG Asbestos Limited in house method of transmitted/polarised light microscopy and centre stop dispersion staining (SCI-ASB-007), based on HSE's HSG 248. The analysis of fine fraction for asbestos content only includes fibres and does not discriminate non-asbestos fibres. All fibres are assumed, unless specified, to be amphiboles. All tests were carried out at ESG Asbestos Laboratory, Ashbourne House, Bretby Business Park, Ashby Road, Burton-upon-Trent, Staffordshire. DE15 0XD, UKAS Laboratory Number 1089.												

SOIL Analysis

ESG Environmental Chemistry
Analytical and Deviating Sample Overview

S154911M

Customer ESG Wokingham
 Site Hyde Park, Hayes
 Report No S154911M

Consignment No S49506

Date Logged 22-Jul-2015

Report Due 07-Aug-2015

ID Number	Description	MethodID	CustServ	Dep. Opt	Lot(%)MM	MCerts	Sub002a	Sub020	TMSS	MSLMS9
		Sampled	REPORT A	DO ID & Quant if ASB found	L.O.I. % @ 450C	MCerts Analysis	^Asbestos Screen	^Asbestos ID & Quan	Tot.Moisture @ 105C	Total Organic Carbon
							✓	✓	✓	
CL/1556011	VS04 0.1	21/07/15								
CL/1556012	VS05 0.12	21/07/15								
CL/1556013	VS06 0.08	21/07/15								
CL/1556014	VS07 0.07	21/07/15								
CL/1556015	VS08 0.065	21/07/15								
CL/1556016	VS09 0.125	21/07/15								
CL/1556017	VS10 0.1	21/07/15								
CL/1556018	VS12 0.1	21/07/15								
CL/1556019	VS13 0.12	21/07/15								
CL/1556020	VS14 0.1	21/07/15								
CL/1556021	VS15 0.1	21/07/15								
CL/1556022	VS16 0.1	21/07/15								
CL/1556023	VS17 0.1	21/07/15								
CL/1556024	VS18 0.1	21/07/15								
CL/1556025	VS19 0.1	21/07/15								

Note: For analysis where the scheduled turnaround is greater than the holding time we will do our utmost to prioritise these samples. However, it is possible that samples could become deviant whilst being processed in the laboratory.

In this instance please contact the laboratory immediately should you wish to discuss how you would like us to proceed. If you do not respond within 24 hours, we will proceed as originally requested.

Deviating Sample Key

- A The sample was received in an inappropriate container for this analysis
- B The sample was received without the correct preservation for this analysis
- C Headspace present in the sample container
- D The sampling date was not supplied so holding time may be compromised - applicable to all analysis
- E Sample processing did not commence within the appropriate holding time

Requested Analysis Key

- Analysis Required
- Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
- No analysis scheduled
- ^ Analysis Subcontracted - **Note: due date may vary**

SOIL Analysis

ESG Environmental Chemistry

Analytical and Deviating Sample Overview

S154911M

Customer ESG Wokingham
 Site Hyde Park, Hayes
 Report No S154911M

Consignment No S49506

Date Logged 22-Jul-2015

Report Due 07-Aug-2015

ID Number	Description	MethodID	CustServ	Dep. Opt	Lot(%)MM	MCerts	Sub002a	Sub020	TMSS	MSLMS9
		Sampled	REPORT A	DO ID & Quant if ASB found	L.O.I. % @ 450C	MCerts Analysis	^Asbestos Screen	^Asbestos ID & Quan	Tot.Moisture @ 105C	Total Organic Carbon
							✓	✓	✓	
CL/1556026	VS11 0.15	21/07/15								
CL/1556027	VS06 0.35-0.45	21/07/15								
CL/1556028	VS08 0.3	21/07/15								
CL/1556029	VS13 0.3-0.38	21/07/15								
CL/1556030	VS17 0.36-0.45	21/07/15								

Note: For analysis where the scheduled turnaround is greater than the holding time we will do our utmost to prioritise these samples. However, it is possible that samples could become deviant whilst being processed in the laboratory.

In this instance please contact the laboratory immediately should you wish to discuss how you would like us to proceed. If you do not respond within 24 hours, we will proceed as originally requested.

Deviating Sample Key

- A The sample was received in an inappropriate container for this analysis
- B The sample was received without the correct preservation for this analysis
- C Headspace present in the sample container
- D The sampling date was not supplied so holding time may be compromised - applicable to all analysis
- E Sample processing did not commence within the appropriate holding time

Requested Analysis Key

- Analysis Required
- Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
- No analysis scheduled
- ^ Analysis Subcontracted - **Note: due date may vary**

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	LOI(%MM)	Oven Dried @ < 35°C	Determination of loss on ignition for soil samples at specified temperature by gravimetry
Soil	SubCon*	*	Contact Laboratory for details of the methodology used by the sub-contractor.
Soil	TMSS	As Received	Determination of the Total Moisture content at 105°C by loss on oven drying gravimetric analysis (% based upon wet weight)
Soil	WSLM59	Oven Dried @ < 35°C	Determination of Organic Carbon in soil using sulphurous Acid digestion followed by high temperature combustion and IR detection

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,

- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
All results on MCERTS reports are reported on a 105°C dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,

- Results are expressed as mg/kg
- SG is expressed as g/cm³@ 15°C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile

TR Denotes Tremolite

CR Denotes Crocidolite

AC Denotes Actinolite

AM Denotes Amosite

AN Denotes Anthophyllite

NAIIS No Asbestos Identified in Sample

NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.

\$\$ Unable to analyse due to the nature of the sample

¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols.

This may have resulted in deterioration of the sample(s) during transit to the laboratory.

Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling

¥ Results for guidance only due to possible interference

& Blank corrected result

I.S Insufficient sample to complete requested analysis

I.S(g) Insufficient sample to re-analyse, results for guidance only

Intf Unable to analyse due to interferences

N.D Not determined

N.Det Not detected

N.F No Flow

NS Information Not Supplied

Req Analysis requested, see attached sheets for results

▮ Raised detection limit due to nature of the sample

* All accreditation has been removed by the laboratory for this result

‡ MCERTS accreditation has been removed for this result

§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : ESG Wokingham
Site : Hyde Park, Hayes
Report Number : S15_4911

Note: major constituent in upper case

[illegible]

Appendix L. Kier Proposed Topsoil Remediation Plan

HPH5 Hayes

Proposal for the removal of topsoil in response to defect notification issued 27-7-15

Scope of works

- CAT Scan area for underground services
- Remove all shrubs tenderly from beds, wash thoroughly, set aside and maintain for re-use following placement of new soil
- Remove drip feed irrigation system in north planting area and reinstate on complete of soil replacement
- Remove all topsoil back to required formation including turf
- Removal of made ground in area 2 (subject to position/level of existing services)
- Retain all trees in place

Area of works

- Planting bed and turfed area to North West area
- Turfed area to north east
- 3no turfed area at tree locations to east car parking area
- Raised Planting bed between car parking bays and podium to east
- Turfed area to south between car park entrance in south east and car parking bay to south west
- As indicated on attached marked up drawing

Programme of works

- Further sampling and testing and submit for approval - 2 weeks (3/8 – 17/8)
- Approval of topsoil – 2 days (17/8-19/8)
- Delivery lead-in – 2 days (19/8 – 21/8)
- Mobilisation of plant and labour – 5 days (13/8 – 20/8)
- Erect temporary fencing between HPH5 and HPH2 (20/8)
- Disconnect and carefully set aside drip irrigation system from planting beds
- Removal of shrubs and set aside – 2 days (20/8 – 21/8)
- Excavation of topsoil and turf and return to supplier as non-compliant material – 5 days 24/8 – 28/8

- Daily air monitoring to be carried out over period of topsoil removal.
- Removal of made-ground in area 2 to stockpile on vacant Plot 4 if required for subsequent removal by waste contractor
- Place topsoil -2 days (1/9 – 2/9)
- Jacobs verify depth of topsoil (by hand dug pits from 5 locations showing depth of emplaced topsoil) – 3/9
- New turf – 3 days (3/9 – 7/9)
- Replant shrubs 2 –days (3/9 – 4/9)
- Reinstate drip feed irrigation to planting bed
- Inspect and handover – day (7/9)

Safety issues

The Willerby RAMS takes into account of managing the low levels of asbestos detected within the imported topsoil. The potential risk of airborne fibres will be controlled by damping down. The works are not considered to present a risk to members of the public. However has an added precaution we will carry out daily air monitoring to verify absence of airborne asbestos fibres.

Appendices

Appdx A – Site Plan

Appdx B - SLC Topsoil Analysis Report –Eversley Topsoil June 2015
(2 no further analysis reports required to meet Jacobs remediation specification T.B.A)

Appdx C - Willerby Landscapes Risk Assessment/Method statement Rev 2

Appdx D - Test results from 3 No Soil samples taken by ESG on 5/8, anticipated issue date 14/8.



METHOD STATEMENT

WLL/1979/15/003 Rev 2

HPH5, Hayes
Contaminated top-soil replacement

Date: 12th August 2015

PROJECT: HPH5 Millington Rd, Hayes

Date: 12 August 2015

The Company Health & Safety Manager and the information received from Jason Smith Contracts Supervisor has produced this method statement on behalf of Willerby Landscapes Limited.

Contact Information: Office – 01732 700646 Mobile - 07766 084112 or
colin.caplehorne@willerby-landscapes.co.uk

INTRODUCTION

Willerby Landscapes Ltd (WLL) is determined to ensure high standards of health and safety on the site. All employees, sub contractor and persons within WLL control are expected to contribute actively in accident prevention, as an integral part of their job.

INDEX

SECTION 1.0	SCOPE OF WORKS
SECTION 2.0	RESOURCES
SECTION 3.0	PERMIT REQUIREMENTS
SECTION 4.0	RISK ASSESSMENTS ASSOCIATED FOR LANDSCAPING
SECTION 5.0	INFORMATION ASSOCIATED WITH SITE
SECTION 6.0	PPE REQUIREMENTS
SECTION 7.0	EMERGENCY ARRANGEMENTS
SECTION 8.0	TRAFFIC ARRANGEMENTS
SECTION 9.0	METHOD STATEMENT SUBMISSIONS
SECTION 10.0	MONITORING AND COMPLIANCE
SECTION 11.0	AMMENDMENTS TO METHOD STATEMENT
Attached	Associated Risk Assessments

PROJECT: HPH5 Millington Rd, Hayes

Date: 12 August 2015

SECTION 1 – SCOPE OF WORKS

a) Location of Works	HPH5 Millington Rd, Hayes
b) Start Date	August 2015
c) Duration	Approx. 7 – 12 days

d) Brief description of Works:

Willerby Landscapes have been tasked to remove soft landscape media, remove contaminated soil, undergo an inspection on the sub soil and on the results of the soil inspection replace clean soil and soft landscapes media

Notes:

1. All operatives are to receive a site briefing by the WLL contracts Supervisor on the first day of works
2. Erect temporary half-height pedestrian fencing round the each of area of works in sequence.
3. Kiers to arrange for use of Paragon site welfare.
4. Kiers to arrange for use of Paragon/ Kier site storage area to the west of site in order to store plant machinery and materials.
5. All operatives are to have read to them and once briefed each individual is to sign this RAMS to state they understand the safe system of works which is to be employed on this site
6. The WLL site supervisor is to carry out daily briefings before any work is carried out on site
7. Great care needs to be taken with regards to vehicle movements adjacent to and in public areas.
8. All plant movement in the public areas needs to be monitored by a banksman.
9. Prior to and during any excavation works the areas to be excavated require “damping down”

PROJECT: HPH5 Millington Rd, Hayes

Date: 12 August 2015

e) Sequence of works:

Notes:

1. All areas are to be CAT scanned before any excavation works are carried out and the services marked using marker spray paint.
NOTE:- Kiers engineer to be in attendance with regards to all setting out and excavation adjacent to services
2. All Planting beds are to be excavated down to a depth of 450mm (or the original formation level as provided by Kiers) and turfed areas are to be excavated to 250mm (or the original formation level as provided by Kiers) NOTE:- Kiers to provide further scope information for any areas that require additional works / excavations into formation layer any areas and this would require instruction.
3. Some car parking spaces will require suspending during each phases of work. To ease disruption to others, the task has been broken down to 5 separate areas, SW, SE, East, NW and NE

Scope of works

Important – all areas to be worked on are to be dampened down using manual watering points and hoses as the excavation of soils takes place.

South West (SW)

1. Kiers to arranged for the suspension of 2 parking spaces adjacent to the works on the SW corner
2. Install ½ height pedestrian barriers around the first phase of work –please see attached drawing to indicate the various sections.
3. WLL supervisor to brief all those involved in the operation in the presence of Kier representative overseeing the works
4. Kiers Engineer to issue permit to dig and also monitor the works
5. CAT Scan all areas to be worked on for underground services and these are to marked on the ground before any excavation commences
6. Off load the 360 excavator & dumper from delivery vehicle and park on the area to be excavated, all movement on the roads is to be monitored by a banksman
7. Monitored by a banksman standing in a safe area, the excavator is to excavate the turf and soil to the depth required – approx. 250mm.
8. Where required, the excavated materials are to be loaded into a dumper and transported to an area of the SW section suitable to stock pile. When not required the material will be directly dug and stock piles using the 360 excavator. This process will continue for a the soil to be removed
9. During this phase the tree will be removed to a safe area, by removing the aeration pipe, and removing the anchorage straps, the tree will then be moved to the edge of the area along with the dead man anchorage blocks

PROJECT: HPH5 Millington Rd, Hayes

Date: 12 August 2015

10. All excavated soil will be removed from site using a grab lorry and returned to the original supplier
11. Once all the soil has been removed to the depth require the area is to be inspected by a Client / Kier representative, once approval has been granted in writing the backfill can commence
12. Replacement top soil will be supplied as per source confirmed from off-site testing. this material will arrive on site on a grab lorry and be unloaded in the area to be back filled
13. The soil will be spread using the 360 excavator and hand tools such as shovels & rakes. The soil will be consolidated and additional material added to achieve final finished levels and the soil fine raked in preparation to receive turf.
14. In conjunction with the above process, the trees anchorage system will be re-installed and the trees will be placed back in the original positions, anchor systems adjusted and the aeration pipe reinstalled
15. Turf will be delivered to site on pallets, unloaded via lorry mounted forklift
16. The area is to be raked to a fine tithe, the turf will be transported by hand or wheelbarrow and laid to pattern, the turf will boarded
17. Once the area has been completed the fencing will be removed and placed around the next area

South East (SE)

The methodology to carry out the work to the SE area will be the same way as for the SW area

East Area:

1. Kier are to arrange for the suspension of all car parking spaces adjacent to the raised planter (approx. 12) on the Eastern elevation of the site
2. ½ height pedestrian barriers will be installed around the working area as shown on the drawing attached
3. For excavation of the higher level planter the proposal is that a 3t 360 excavator is tracked from the NW corner of the site on the paving using 18mm ply boards for protection – Kiers to approve
4. All plants will removed from their present position and washed in situ, once washed they will be shaken off and placed in a pot and put in a secure area awaiting replanting
5. The 360 excavator will be brought into position on the planter to excavated the soil to the depth required (approx. 450mm), the soil will be heaped into piles
6. A grab lorry will arrive on site and park in the area of the suspended parking spaces, the grab will be used to remove the contaminated soil. NOTE:- care to be taken with regards to finishes such as paving, balustrades etc.
7. Once all the soil has been removed to the depth require the area is to be inspected and tested by a Client / Kier representative, once approval has been granted in writing the backfill can commence
8. A grab lorry will arrive with the new top soil, this will be grab and spread as before

PROJECT: HPH5 Millington Rd, Hayes

Date: 12 August 2015

9. The plants will be planted by making holes in the soil and inserting the plants using hand-tools, any excess soil will be spread around the local area
10. Replacement bark mulch will be spread onto the soil between the plants to an approx. depth of 50mm
11. For the lower level planters between car-parking bays containing trees, the turf and soil in the tree areas will be loaded into a dumper and transported to the NW area and tipped in preparation to be removed from site with grab lorries.
12. The area will be inspected as before and new soil put back in place, consolidated and graded to the required levels using the 360 excavator and operatives with hand tools.
13. To finish of the area will be turfed, to be laid as per above

NE and NW Areas

1. Kier are to arrange for some footpaths to be closed or redirected
2. 1/2 height pedestrian barriers are to be placed around both areas of works to act as a barrier to keep all persons out of the work area, as per attached marked up sketch
3. All plants in the NW area are to be removed and washed as before and placed in a safe place adjacent to work area
4. Boarding / protection (2 layers of 18mm ply cross laid – Kiers to approve) is to be laid to the paving area between the NE and NW soft landscape areas
5. Irrigation pipework to the soft landscape (NOT INSTALLED BY WLL) will be removed and set aside for reuse under supervision from Kiers / M&E contractor, to be replaced by upon completion of the works.
6. The turf and soil in the NE area will be excavated and place in a dumper, this will then be transported to the end of the area in the NW area (currently where the temporary electrical sub-station is situated – Kiers to confirm that this will be removed before commencement of works), the existing soil will be collected as before by being picked up by grab lorry.
7. Once all soil and turf has been removed the area will be inspected and signed off as per previous sections.
8. The soil will then be removed from the NW area and stockpiled at the end of the area
9. This will then be removed
10. Once all soil etc has been removed from both areas the area will be inspected as before
11. Once the area is available, top soil will be tipped on the NW area, loaded into the dumper by excavator, transported to the NE area, tipped and spread
12. Turf will be delivered and laid on the soil has before on other areas
13. Once the NE area is complete the soil will be spread around the NW area and the plants reinstall as for the raised planter on the east side
14. All areas will be watered and the areas left clean and tidy

f) Drawings / diagrams attached

See attached

PROJECT: HPH5 Millington Rd, Hayes

Date: 12 August 2015

SECTION 2 – RESOURCES

a) Personnel	b) Names	c) Contact Numbers
Contracts Supervisor	Jason Smith	07887 748623
Site Supervisor	TBC	
Operatives x 2 - 6		
d) Plant requirement • Hand tools • Excavator • Dumper • CAT scanner		
e) Materials • Top soil • Turf		

SECTION 3 – PERMITS REQUIRED

Excavations	Y	Working at Height	N	Noise	N
Confined Spaces	N	Hot Works	N	General Works Permit	N
HIAB	N	Delivery Forms	N	Electric installation	N

1. The client is to issue all permits required to carry out the task

SECTION 4 – RISK ASSESSMENTS ASSOCIATED WITH LANDSCAPING

<u>Significant risks:</u>	<u>Control Measures</u>
a) Bad communications	All personnel are to be briefed and a signature is required on this method statement (RAMS) to say they understand the contents and sequence of events.

PROJECT: HPH5 Millington Rd, Hayes

Date: 12 August 2015

b) Lack of knowledge of procedures	All operatives must receive the site induction / brief by the client and a daily briefing by the WLL Supervisor before being allowed to work on site.
c) Manual handling	All operatives used on this task are to be trained and certificated in Manual Handling
d) Segregation protection form excavated works areas and the public	½ height pedestrian barriers is to be placed around the excavation area and the access / egress is to be controlled

SECTION 5 – INFORMATION ASSOCIATED WITH SITE

<u>Significant risks:</u>	<u>Control Measures</u>
a) Access / Egress	As per the site brief
b) Place of works	As per the drawings attached
c) Use of equipment	Use of the correct PPE when on site – see risk assessment attached
d) Security	All tools and equipment when not in use must be packed away in tool boxes or vehicles
e) COSHH	N/A
f) Rubbish Removal	WLL to arrange removal of rubbish.
g) Housekeeping	The area and walkways are to be keep clean and tidy at all times, protect new paving in all areas of work
h) Working area / Accessibility	Keep all working areas clear of obstructions
i) Asbestos	Care must be taken to avoid the spreading of the soil into other clean areas
j) Storage of Materials etc	Bring and used system
k) Smoking	Only in designated areas

PROJECT: HPH5 Millington Rd, Hayes

Date: 12 August 2015

l) Vehicle Parking	Use compound car park
m) Working near the road	Great care must be taken when working adjacent to the public roads, signage and banksman are to be used to warn other road users
n) Welfare facilities	Supplied by Kier.
Environmental Issues	
o) Dust	All areas are to be dampened down before any excavation takes place
p) Noise	Keep to a minimum

SECTION 6 – PPE REQUIREMENTS

All personnel on site are to wear Hi Vis vest (with Willerby Landscapes name), Steel toe capped boots with mid soles, disposable overalls and safety helmets.

See the risk assessment attached for other PPE required

SECTION 7 – EMERGENCY ARRANGEMENTS

As covered during the site briefing

WLL will provide as part of the team a one day emergency First Aider

SECTION 8 – TRAFFIC ARRANGEMENTS

a) Delivery arrangements: Materials are to be delivered on the system of deliver and use

PROJECT: HPH5 Millington Rd, Hayes

Date: 12 August 2015

SECTION 9 – TO WHOM THE METHOD STATEMENT WILL BE SUBMITTED

a) Checking: Site manager –

SECTION 10 – MONITORING AND COMPLIANCE

By signing this document, you agree that you have been briefed or read the safe system of works and fully understand what's required of you. In addition, you're aware that failing to adhere to the company's Health & Safety arrangements is a disciplinary offence

[illegible]

PROJECT: HPH5 Millington Rd, Hayes

Date: 12 August 2015

SECTION 11 - AMENDMENTS TO METHOD STATEMENT

As authorised in section 9 paragraph c:





Contaminated Soil - Risk Assessment Analysis

Assessor's Name:	Colin Caplehorne	Task reference:	ALL	Review Date (no later than):-	12 August 2015
------------------	------------------	-----------------	-----	-------------------------------	----------------

Facts:

Willerby Landscapes carried out a task for Kier in the early part of 2015 (April – May), the task was to supply soft landscapes media which included soil to the site at HPH5 Millington Rd, Hayes.

1. It has now come to light that the soiled supplied to Willerby by their supplier was in fact contaminated, test based on further tests by Kier and Willerby as well as test results provided by Jacobs[®] indicated that the soil contains 0.001% (10 mg/kg) of asbestos which is classed as a very low hazard to others health if treated correctly.
2. Willerby Landscapes Ltd Health and Safety Manager has carried out this analysis with information supplied by the internet and by communications with the company management
3. Due to the hand - over of the site, our Client (Kiers) have requested that the contaminated soil and turf be removed from site, once the site has been re-inspected and tested by a representative from Kiers, new uncontaminated soil is to be delivered to site and placed in the original areas so that the soft landscapes media can be reinstalled i.e. plants, trees and turf

Risk Assessment

Calculation of Risk Exposure:	
SEVERITY (S) = Catastrophic (5) - Major (4) - Reportable (3) - Serious (2) - Minor (1) LIKELIHOOD (L) = Frequent (5) - Probable (4) - Occasional (3) - Improbable (2) - Remote (1) Degree of Risk (DR) = LIKELIHOOD x SEVERITY * Residual risk is the level of risk that remains after suitable and sufficient control measures are introduced	Key to risk rating/categorisation: 1-2 = Low 3-4 = Moderate 5-8 = Medium 9-25 = Unacceptable

Activity	Hazard	Severity	Livelihood	Risk level before controls	PPE to be worn	Severity with controls	Likelihood with controls	Risk level with controls	Additional Controls Required to Achieve ALARP	Final Risk Level
Removal of soil contaminated with 0.001 % of Asbestos	Breathing in contaminated soil and asbestos partials	4	5	20	The soil and turf areas to be removed are to be dampened down to avoid dust being air borne during the excavation Soil is to be removed in layers, each layer of soil before being removed is to be watered down All soil removed is to be stockpiled in certain locations and kept moist until removed Once the soil is removed from site it is to be transported back to the original supplier All vehicles removing the soil must be fully sheeted	4	2	8		
Checking the areas for electrical services and pipe runs	Cable strike Burst pipes	4	4	16	The client is to issue all drawings of the areas to be excavated The client is to issue a permit to dig in the areas to be excavated All areas to be excavated are to be CAT scanned before any excavation commences Any irregularities are to be reported to the representative on site (Kier to supply)	4	1	4		

Activity	Hazard	Severity	Livelihood	Risk level before controls	PPE to be worn	Severity with controls	Likelihood with controls	Risk level with controls	Additional Controls Required to Achieve ALARP	Final Risk Level
Operatives operating plant	Not trained in contaminates in soils	4	4	16	All those involved in the excavation of soils must have attended asbestos training and be certificated The operators must be CPCS certificated When operating the excavator the doors are to be shut All excavation work is to be monitored by a banksman standing at a safe distance The banksman is to stand up wind during all digging operations The dumper operative is not to sit on the dumper whilst being loaded All refuelling operations are to be carried out on a hard stand, spill kits are to be in attendance No keys are to be left in machines if left unattended	4	1	4		
Traffic control	Injury from other vehicles	4	3	12	Due to the amount of traffic in the area during the site visit, it was not felt necessary to have in place a full road or partial road closure in place – But all vehicles using the roads to transport materials are to be monitored by a banksman Signage is to be put in place warning other road users of the hazards approaching the work areas when vehicles may be positioned All work areas are to be protected using 1/2 height pedestrian barriers	4	1	4		
Pedestrians working / walking in the vicinity	Injury from walking into unprotected areas	4	4	16	½ height pedestrian barriers are to be in place around all work areas Supervisors are to kept others away from the barriers and if spoken to be courteous at all times When crossing new paths the paving is to be protected using timber boards	4	2	8		
PPE	Dermatitis	3	4	14	Banksman and operatives working in amongst the soil are to wear rubber boots, no soil is to be touched without using rubber gloves, this is a precaution due to the dampness / wetness of the soil and surrounding area	3	1	3	Good Hygiene is essential	

Activity	Hazard	Severity	Livelihood	Risk level before controls	PPE to be worn	Severity with controls	Likelihood with controls	Risk level with controls	Additional Controls Required to Achieve ALARP	Final Risk Level
					Normal site rules apply, helmet, hi vi vest, steel capped boots and glasses This may change on specialist advice No smoking on site The client is to supply welfare facilities					
<u>On – site risks</u>										

This risk level has been reduced as low as is reasonably practicable (ALARP)

Assessor's Signature: Colin Caplehome

Date: 12 August 2013

This is to certify that I have read and understood the above risk assessment and control measures

Name	Signature	Date	Name	Signature	Date