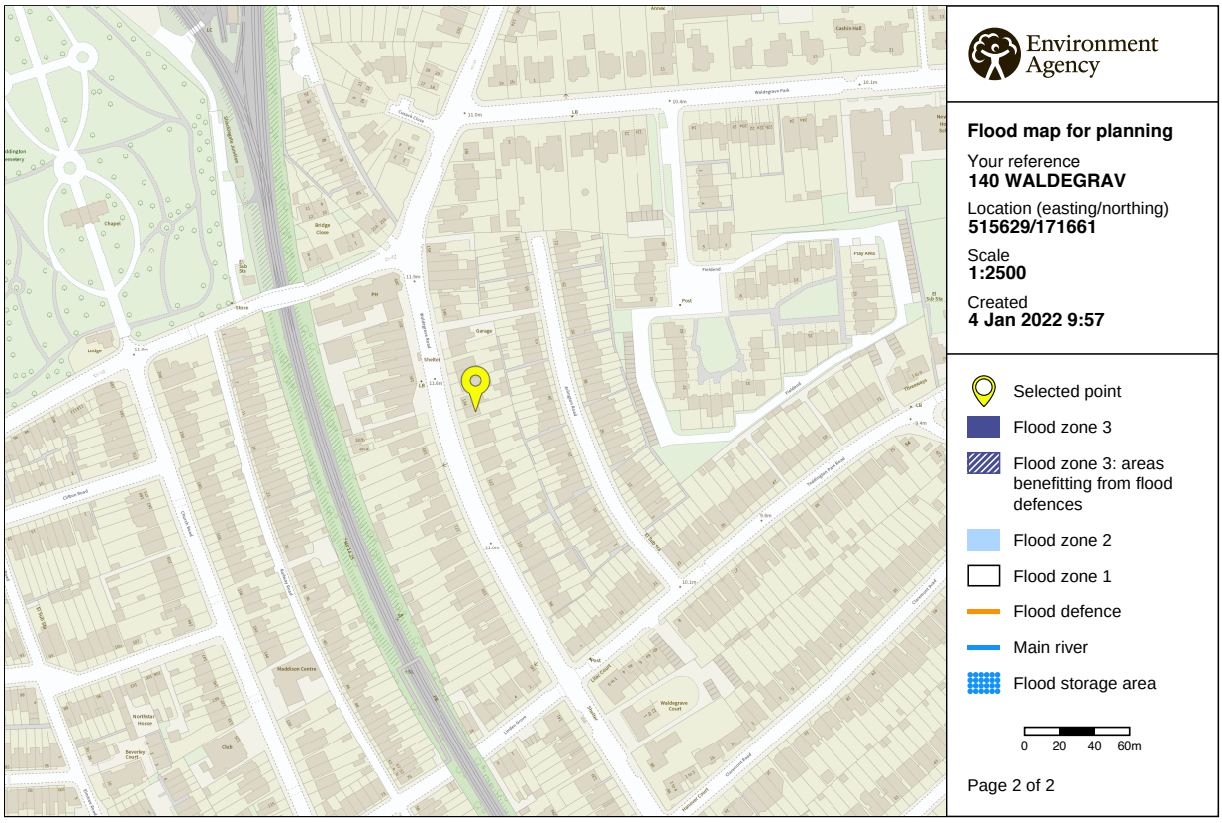
Soil Investigation Report

Garage to rear of 140/142 Waldegrave Road,

Teddington TW11 8NA



Flood map for planning

Your reference	Location (easting/northing)	Created
140 WALDEGRAV	**515629/171661**	**4 Jan 2022 9:57**

Your selected location is in flood zone 1, an area with a low probability of flooding.

This means:

- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

ADDITIONAL NOTES

1. The site lies within Flood Zone 1 –land assessed as having a low probability of flooding

2. The site is a single storey garage, currently used for general storage. The proposals are to excavate a semi basement area to enlarge the existing accommodation and to construct a raised mezzanine over part of the area and therefore the EA Checklist has been completed and is attached as **Appendix A**.

3. The lifetime of the extension is proposed to be 100 years. The floor and retaining wall construction is to be poured concrete. The floor and walls will be tanked internally using a proprietary drained cavity system.

4. The applicant has previously carried out basement extensions at the house No. 138 and geotechnical explorations had established that the ground water was not present to any significant extent

5. Aluminum door and window frames will be silicon sealed to the external finishes.

6. The electrical services within the building will be designed so that sockets etc. are located 300mm above the finished floor level.

7. In the event of the whole site being flooded, the mezzanine area on the first floor which can be used as a temporary refuge.

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The Old Post Office, Wellpond Green, Standon,
Ware, Herts, SG11 1NJ

Telephone : Ware (01920) 822233
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14th October 2014

Our Ref : DAH/12349

Zussman Bear
395 St Margaret's Road
Richmond
TW7 7BZ

Dear Sirs,

Re : 138 Waldergrave Road, Teddington, TW11 8NA

Geotechnical Investigation

1.0 Introduction

1.01 In accordance with your instructions, we visited the above site during September 2014.

1.02 The purpose of our visit was to undertake three hand excavated trial pits, along with two percussive drilled boreholes, upon the existing site.

1.03 The comments and opinions expressed are based purely on the conditions encountered and the subsequent laboratory.

1.04 Therefore, it is possible that some special conditions prevailing on site have not been encountered or taken into account.

1.05 All groundwater recordings or their absence relate to short term observations and do not allow for fluctuations due to seasonal or other effects.

2.0 Description of Site

2.01 At the time of our visit the site consisted of a double storey residential structure with various soft & hard landscaped areas.

2.02 The site is shown within the British Geological Survey online Geology Viewer (Scale 1:50 000, Solid & Drift), which shows that the site situated within an area of Kempton Park Gravel.

3.0 Fieldwork

3.01 The three hand excavated trial pits were undertaken upon the existing structure with the percussive drilled borehole being undertaken remote from these and undertaken in order to detail the geology at a depth. The trial pit & borehole locations are shown on the site plan forming appendix one.

3.02 The various strata encountered were noted and are recorded within the borehole logs forming appendix two.

3.03 Bulk samples were recovered from the boreholes, as noted within the associated log for laboratory testing.

3.04 The location, type and height of any trees should be taken from a survey for later use with NHBC Chapter 4.20, if required.

4.0 Laboratory Testing

4.01 All samples were tested in accordance with BS:1377:1990 Methods of Test for Soils for Civil Engineering purposes.

4.02 Selected samples were tested to determine their, Particle Size Distribution, Soluble sulphate content and pH value.

4.03 The results of all laboratory testing are summarised in appendix three.

5.0 Fieldwork Results

Trial Pit Results

5.01 Trial pit one, exposed a concrete strip footing founded at 1.00m, within as medium dense dark orange brown slightly clay bound SAND.

5.02 Trial pit two, recorded a concrete strip footing founded at 1.14m within a medium dense dark orange brown slightly clay bound SAND.

5.03 Trial pit three, detailed a concrete strip footing founded at 1.00m within a medium dense dark brown fine SAND with some fine gravel.

Borehole Results

5.04 Borehole one, recovered made ground to a depth of 0.20m. Where a medium dense orange brown slightly clayey SAND & GRAVEL was seen to 2.00m. Below this and seen to the close of the borehole at 3.00m a dense orange brown SAND & GRAVEL was present. The borehole was continued to a depth of 6.00m by means of dynamic probe. With the results of this being found within the attached appendices.

5.05 Borehole two, was a dynamic probe taken to a depth of 5.00m, the results of this can be found within the attached appendices.

5.06 The trial pit & borehole log can be found forming appendix two.

Other Observations from Site Works

5.07 Groundwater was struck within borehole one's dynamic probe at a depth of 4.00m. No other water strikes were encountered within the on site excavations.

5.08 Within the underlying SAND & GRAVEL geology SPT 'N' values of 29-63 were achieved. Due to the presence of groundwater the minimum safe bearing capacity of 120kn/m^2 can be used within the design

5.09 No roots were encountered within the borehole undertaken.

6.0 Laboratory Testing Results

6.01 Laboratory testing proved the SANDS & GRAVELS to contain less than 35% fines which indicates they are not susceptible to movement associated with moisture content change.

6.02 Samples have been tested in accordance with BRE Digest 363 in order to confirm the likelihood of sulphate attack on any concrete used. From the information gained, we can say that the subsoil contains less than 0.50g/l of soluble sulphate, therefore any concrete in contact with the subsoil would be required to be of class 'DS-1' cement.

We hope that this is of satisfactory, however if you should require any further information, please do not hesitate to contact us.

Yours faithfully,

D.A. Hudd
Contract Engineer

M. R. Smith M.Sc
Principal Engineer

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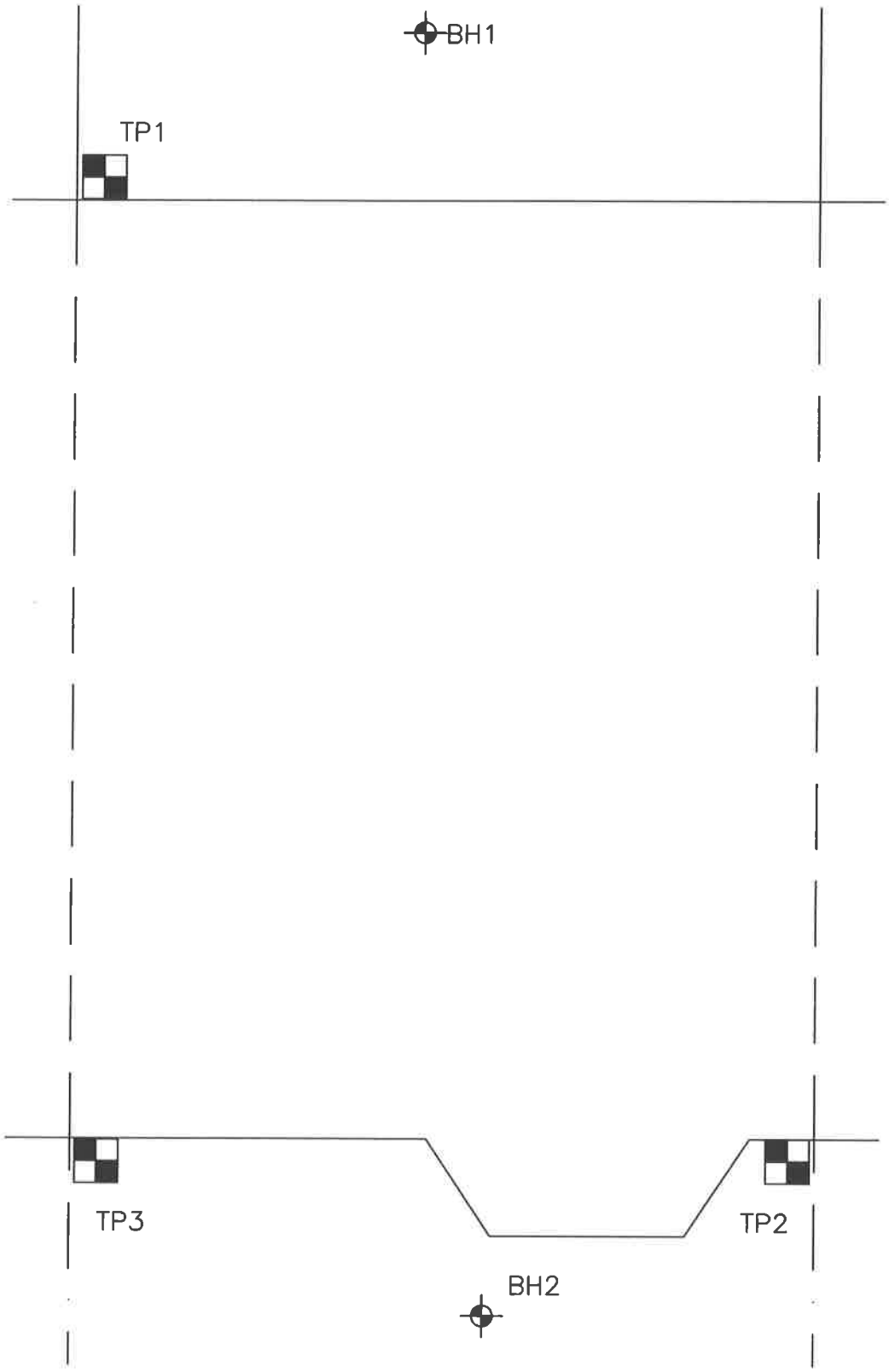
138 Waldergrave Road, Teddington, TW11 8NA

Site Plan



Not to Scale

H & E SI

138 Waldergrave Road, Teddington, TW11 8NA

Existing Footing Detail

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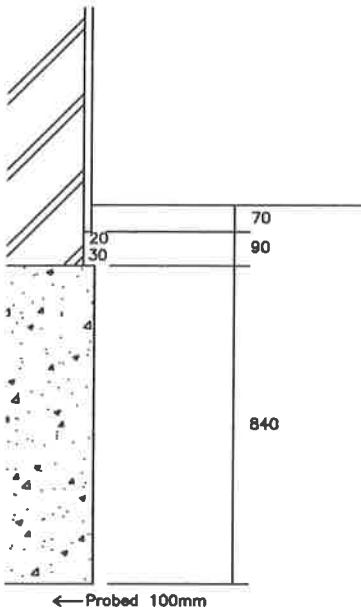
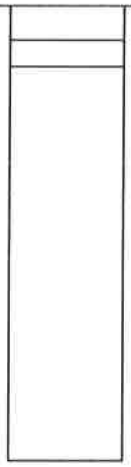
Trial Pit One



B1 @ F.L. (1000mm)
N= 25



Closed @ 1.20m

No Roots

Paving over Concrete
Type 1 material
Medium dense dark orange brown slightly claybound SAND

Scale 1 : 20

NOTES

▽ = Standing Water
▼ = Water Strike
B = Bulk Sample
V = Shear Vane Test (kN/M^2)
N = SPT 'N'-Value

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Existing Footing Detail

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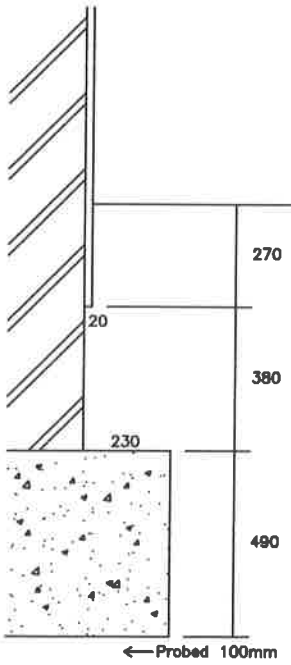
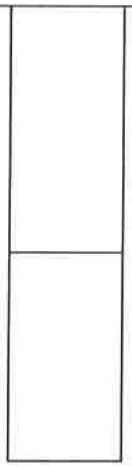
Trial Pit Two



B1 @ F.L. (1140mm)
N= 23



Closed @ 1.20m

No Roots

Loose dark brown topsoil/sandy brick & concret – FILL

Medium dense dark orange brown slightly claybound SAND

Scale 1 : 20

NOTES

▽ = Standing Water
▼ = Water Strike
B = Bulk Sample
V = Shear Vane Test (kN/M^2)
N = SPT 'N'–Value

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Existing Footing Detail

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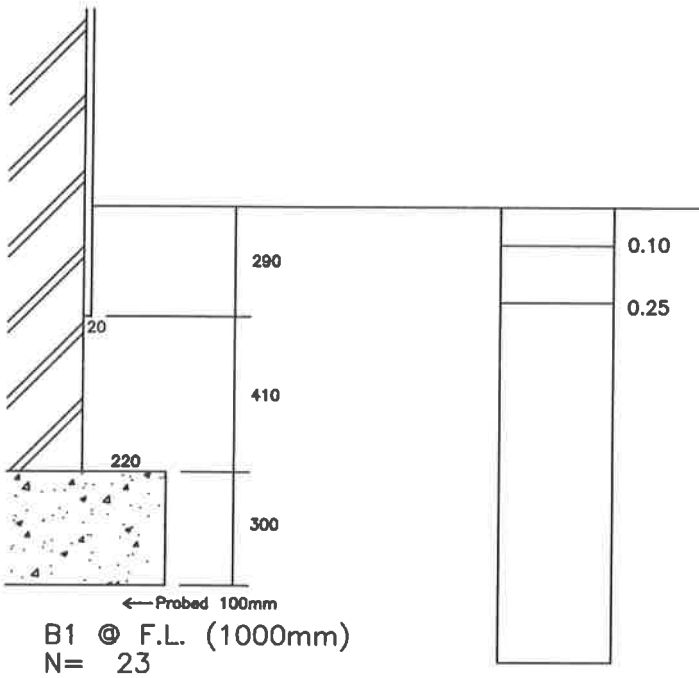
Trial Pit Three



B1 @ F.L. (1000mm)
N= 23

Closed @ 1.20m

No Roots

Paving over Concrete

Comapct brick & gravel hardcore – FILL

Medium dense dark brown fine SAND with some fine gravel

Scale 1 : 20

NOTES

▽ = Standing Water
▼ = Water Strike
B = Bulk Sample
V = Shear Vane Test (kN/M^2)
N = SPT 'N'–Value

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138 Waldergrave Road, Teddington, TW11 8NA

Borehole One

Description of Strata	Depth	Reduced Level	Legend	Thickness (m)	Water Level	Samples No.	Samples Type	Samples Depth (m)	S.P.T N-Value or Vane Strength	Casing Depth (m)
Loose dark brown sandy Topsoil – FILL	0.20			0.20	Borehole Dry	1	U	0.00		
Medium dense orange brown slightly clayey SAND & GRAVEL						2	U	1.00		1.00
				1.80		1	N	1.00	29	
	2.00					3	U	2.00		
Dense orange brown SAND & GRAVEL						2	N	2.00	36	
	3.00					3	N	3.00	63	
Borehole Closed @ 3.00m Borehole continued by means of dynamic probe to a depth of 6.00m										

Remarks:

Scale 1:50

Key : U–Undisturbed Sample (100mm diameter) B –Bulk Sample ▼ –Water Struck D –Disturbed Sample ▽ –Water Standing W–Water Sample P–Piston Sample N–S.P.T. N–Value V–Vane Strength (kN/m²)

Dynamic Probe Plot - Continued from close of BH1

Site: **138 Waldergrave Road, Teddington, TW11 8NA**

Client: **Zussman Bear Partnership**

Date: **Oct-14**

N.B. Standard Penetration Test 'N' values can be calculated from the dynamic probe results by taking 3 consecutive blow counts for 10 cm and adding them together. ie. N = DP 300 (where water is encountered within a granular material, the bearing capacity should be halved)

Depth (m)	Blows (No.)	S.P.T N - Value	Bearing Capacity kN/m²	Depth (m)	Blows (No.)	S.P.T N - Value	Bearing Capacity kN/m²
3.50	21						
3.60	15						
3.70	13						
3.80	12						
3.90	11						
4.00	9						
4.10	7						
4.20	6						
4.30	9						
4.40	10						
4.50	9						
4.60	9						
4.70	11						
4.80	11						
4.90	9						
5.00	9						
5.10	10						
5.20	11						
5.30	13						
5.40	11						
5.50	10						
5.60	8						
5.70	9						
5.80	11						
5.90	11						
6.00	9						

Note: Water was noted at 4.00m in the probe hole

Dynamic Probe Plot for BH2

Site: **138 Waldergrave Road, Teddington, TW11 8NA**

Client: **Zussman Bear Partnership**

Date: **Oct-14**

N.B. Standard Penetration Test 'N' values can be calculated from the dynamic probe results by taking 3 consecutive blow counts for 10 cm and adding them together. ie. N = DP 300 (where water is encountered within a granular material, the bearing capacity should be halved)

Depth (m)	Blows (No.)	S.P.T N - Value	Bearing Capacity kN/m²	Depth (m)	Blows (No.)	S.P.T N - Value	Bearing Capacity kN/m²
0.10	PIT						
0.20							
0.30							
0.40							
0.50							
0.60	1						
0.70	1						
0.80	1						
0.90	1						
1.00	1						
1.10	1						
1.20	1						
1.30	1						
1.40	3						
1.50	3						
1.60	2						
1.70	6						
1.80	13						
1.90	33						
2.00	41						
2.10	44						
2.20	36						
2.30	29						
2.40	19						
2.50	10						
2.60	8						
2.70	9						
2.80	10						
2.90	12						
3.00	14						
3.10	13						
3.20	10						
3.30	11						
3.40	18						
3.50	27						
3.60	37						
3.70	38						
3.80	30						
3.90	37						
4.00	38						
4.10	38						
4.20	37						
4.30	32						
4.40	30						
4.50	24						
4.60	16						
4.70	13						
4.80	13						
4.90	15						
5.00	14						

Note: No water was encountered within the probe hole.

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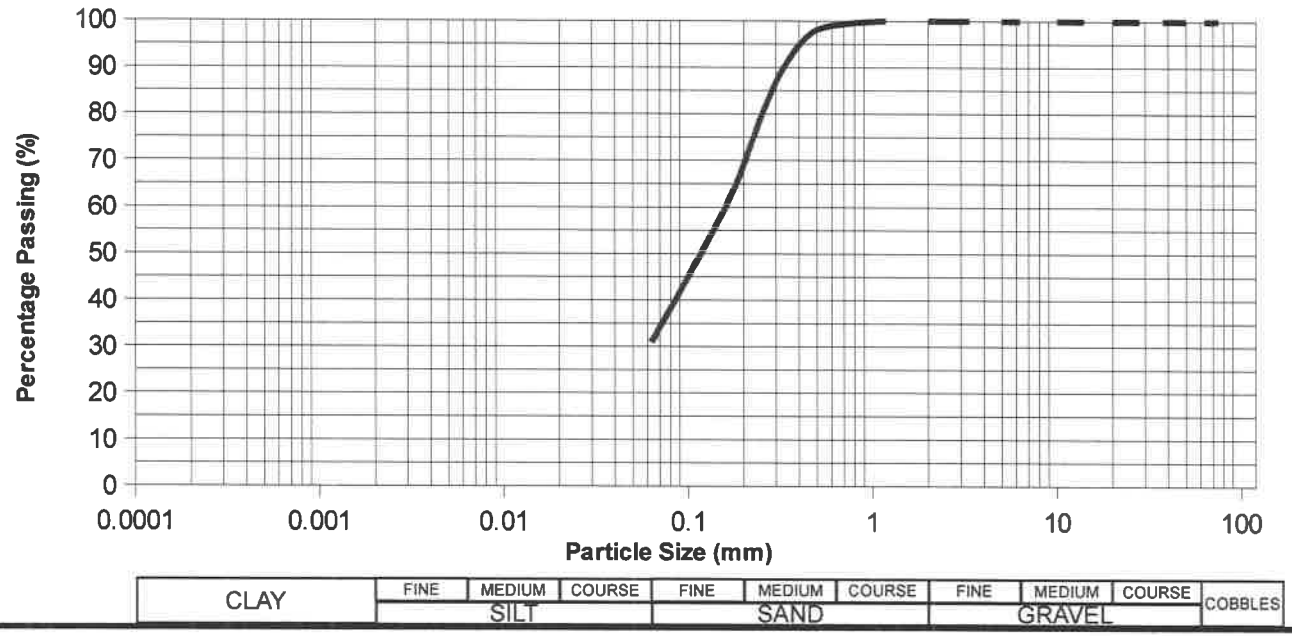
Sieve Size (mm)		Percent Retained (%)	Total Passing (%)
75		0	100
63		0	100
50		0	100
37.5		0	100
28		0	100
20		0	100
14		0	100
10		0	100
6.3		0	100
5		0	100
3.35		0	100
2		0	100
1.180		0	100
0.600		1	99
0.425		3	96
0.300		9	87
0.212		15	72
0.150		14	58
0.063		27	31

PARTICLE SIZE DISTRIBUTION



Fines (%) = **31** Sands (%) = **69** Gravels = **0**

Site Address: **138 Waldergrave Road, Teddington, TW11 8NA**

Trial Pit No. : **1**

Description of Soil:

Medium dense dark orange brown slightly claybound SAND

Sample No. : **B1**

Depth : **FL**

British Standard Sieve Test 5930:1990 as Per Test 7a

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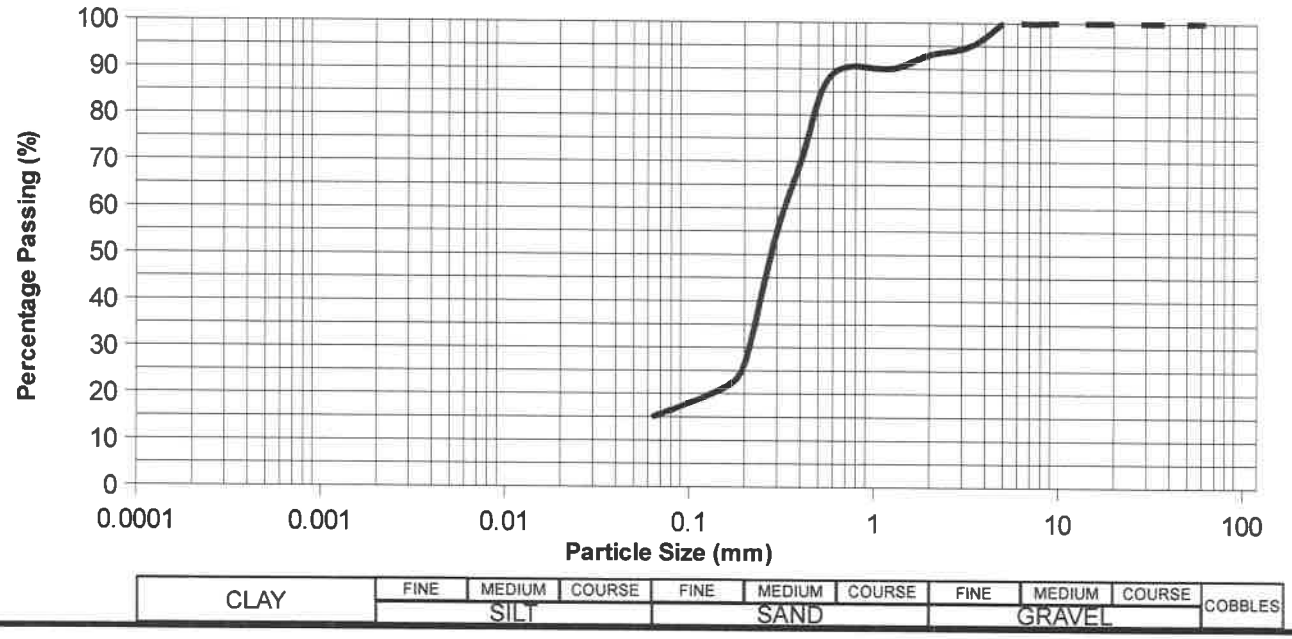
75		0	100
63		0	100
50		0	100
37.5		0	100
28		0	100
20		0	100
14		0	100
10		0	100
6.3		0	100
5		0	100
3.35		5	95
2		2	93
1.180		3	90
0.600		1	89
0.425		16	73
0.300		18	55
0.212		25	30
0.150		9	21
0.063		6	15

PARTICLE SIZE DISTRIBUTION



Fines (%) = **15** Sands (%) = **78** Gravels = **7**

Site Address: **138 Waldergrave Road, Teddington, TW11 8NA**

Trial Pit No. : **3**

Description of Soil:

Medium dense dark orange brown slightly claybound SAND

Sample No. : **B1**

Depth : **FL**

British Standard Sieve Test 5930:1990 as Per Test 7a

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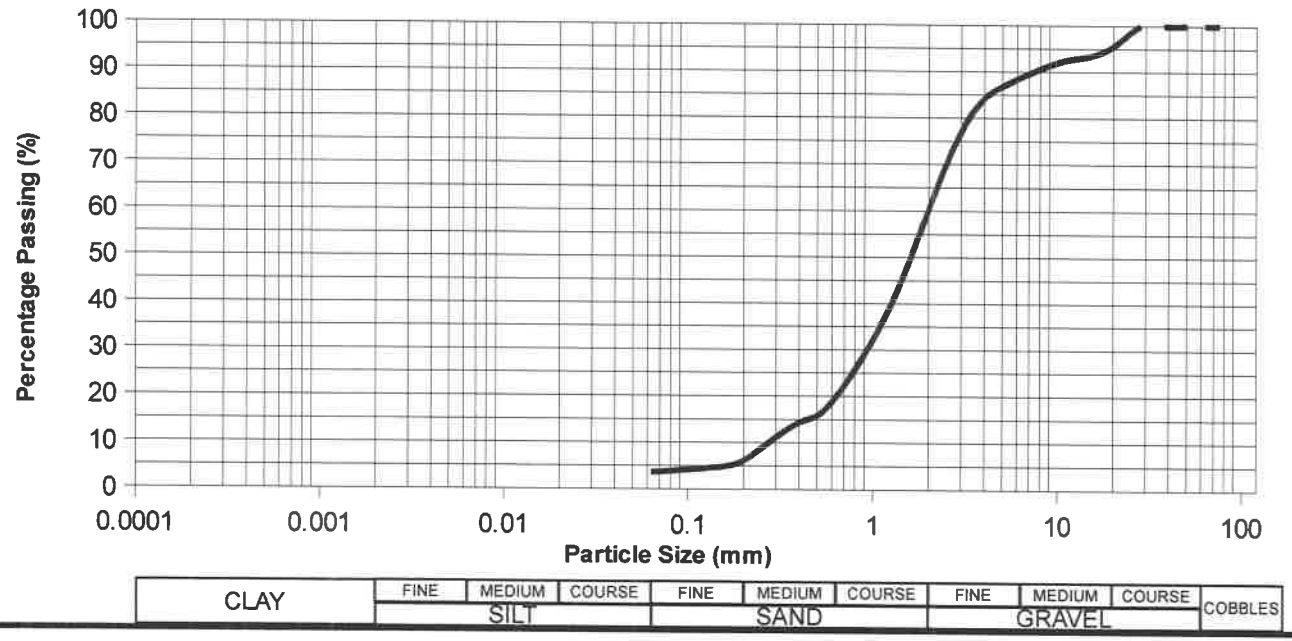
Sieve Size (mm)		Percent Retained (%)	Total Passing (%)
75		0	100
63		0	100
50		0	100
37.5		0	100
28		0	100
20		4	96
14		2	93
10		1	92
6.3		3	89
5		2	87
3.35		6	80
2		20	60
1.180		23	38
0.600		19	19
0.425		4	15
0.300		4	11
0.212		4	7
0.150		2	5
0.063		1	4

PARTICLE SIZE DISTRIBUTION



Fines (%) = **4** Sands (%) = **57** Gravels = **40**

Site Address: **138 Waldergrave Road, Teddington, TW11 8NA**

Borehole No. : **1**

Description of Soil:

Medium dense orange brown SAND & GRAVEL

Sample No. : **U3**

Depth : **2.00m**

British Standard Sieve Test 5930:1990 as Per Test 7a

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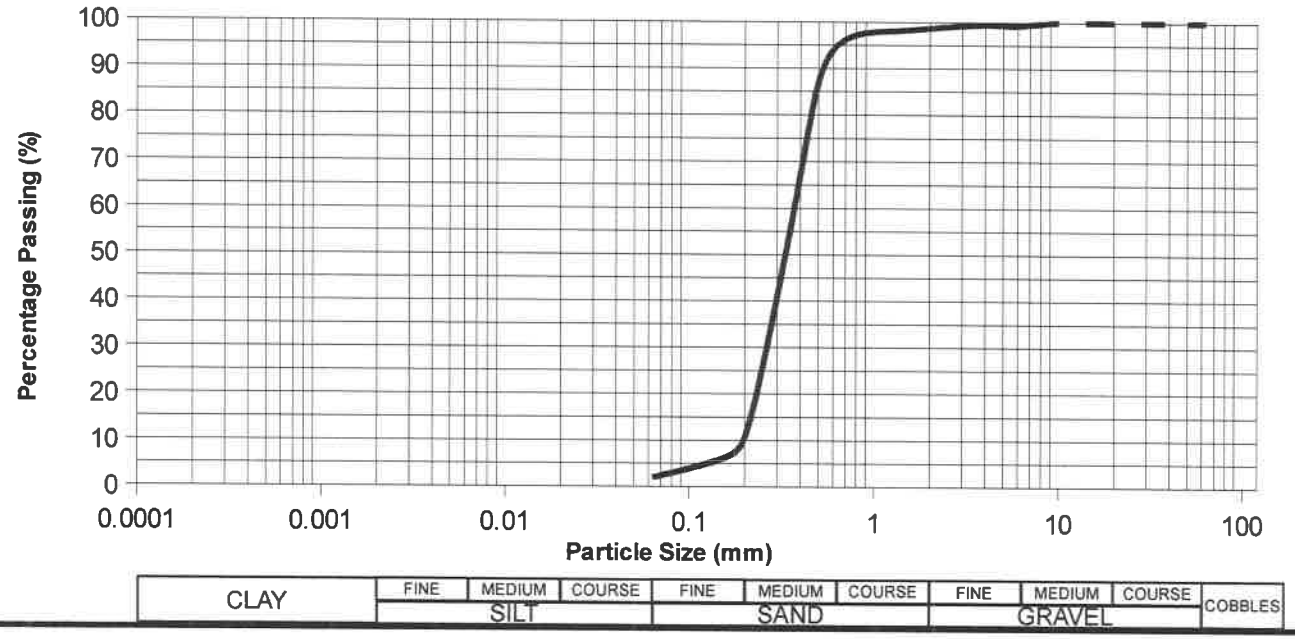
Sieve Size (mm)		Percent Retained (%)	Total Passing (%)
75		0	100
63		0	100
50		0	100
37.5		0	100
28		0	100
20		0	100
14		0	100
10		0	100
6.3		1	99
5		0	99
3.35		0	99
2		1	99
1.180		1	98
0.600		4	94
0.425		21	73
0.300		32	41
0.212		27	14
0.150		8	6
0.063		4	2

PARTICLE SIZE DISTRIBUTION



Fines (%) = **2** Sands (%) = **97** Gravels = **1**

Site Address: **138 Waldergrave Road, Teddington, TW11 8NA**

Borehole No. : **1**

Description of Soil:

Dense orange brown SAND & GRAVEL

Sample No. : **U3**

Depth : **3.00m**

British Standard Sieve Test 5930:1990 as Per Test 7a

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3
3
12349
Oct-14

LOCATION *138 Waldergrave Road, Teddington, TW11 8NA*

SULPHATE ANALYSIS TEST RESULTS

Trial Pit No.	Depth (m)	Sample	Concentrations of Soluble Sulphate			Classification	pH
			Soil		Groundwater		
			Total SO_4 (%)	SO_4 in 2:1 Water:soil (g/l)			
1	**FL**	**B1**		**0.21**		**DS-1**	**7.59**