LAND INVESTIGATIONS

GROUND SOLUTIONS

GROUND INVESTIGATION

AD PLANT
BV DAIRY
WINCOMBE LANE
SHAFTESBURY
DORSET
SP7 8QD

FACTUAL GEOTECHNICAL REPORT

PROJECT 1986

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GROUND INVESTIGATION
FACTUAL GEOTECHNICAL REPORT
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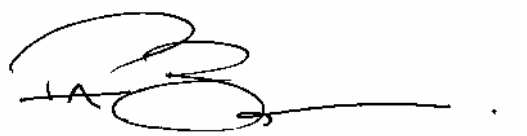
OCTOBER 2009

CLIENT

BV DAIRY
WINCOMBE LANE
SHAFTESBURY
DORSET
SP7 8QD

ENGINEER

ANDREWS NEWBY PARTNERSHIP
FORDER HOUSE
BURITON
PETERSFIELD
HAMPSHIRE
GU31 5RX



Patrick Brennan BSc FGS MCIQ CQP
Chartered Quality Professional
LAND INVESTIGATIONS

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Appendices

1 INTRODUCTION

1.1 This report presents the factual findings of an intrusive ground investigation carried out at the BV Dairy, Wincombe Lane, Shaftesbury, Dorset, SP7 8QD (the site).

The investigation was carried out in September 2009 on the instructions of the Andrews Newby Partnership, on behalf of BV Dairy Limited, in respect of a proposed anaerobic digestion scheme.

1.2 The site is located to the northeast of Shaftesbury town off Wincombe Lane (local road).

The site lies within a predominantly agricultural area with nearby woodland to the northeast and southeast, and residential properties lying between the northwest and southwest.

The purpose of the investigation was to establish the subsurface ground conditions to provide information on the geotechnical aspects of the proposed development.

A previous ground investigation was carried out by Newton Technology Resources in 2003 (Project NTR/0786).

1.3 The scope of the investigation comprised four exploratory trial pits to a maximum depth of 3.30m with associated sampling and subsequent laboratory testing and analyses.

In-situ Dynamic Cone Penetrometer-CBR relationship tests were carried out adjacent to three of the pits.

A soakage test was carried out in one pit.

1.4 The description of the ground conditions encountered is based on the information derived from the trial pits, in-situ and laboratory tests and analyses, and may be specific to the pit or test positions. All depths referred to are below the existing ground level.

1.5 All recovered samples pertaining to this project held by Land Investigations will be disposed of on the last day of the month following that in which this report is issued, unless contrary instructions are received in writing.

2 PUBLISHED GEOLOGY

2.1 The British Geological Survey map for the Shaftesbury area shows the site to be underlain by Boyne Hollow Chert.

2.2 Boyne Hollow Chert comprises interbedded chert beds and nodules with glauconitic sand and sandstone.

3 GROUND INVESTIGATION

3.1 Trial Pits

Four exploratory trial pits were mechanically excavated to depths of between 2.00m and 3.30m at positions advised by the Andrews Newby Partnership (designated Trial Pits 7 - 10). The depths were limited by the nature of the ground conditions encountered.

Dynamic Cone Penetrometer-CBR relationship tests were carried out adjacent to Trial Pits 7, 8 and 10.

Trial Pit 9 was utilised for a soakage test.

Small (D) and bulk (B) disturbed samples were taken from each soil stratum encountered.

3.2 Records

The trial pit records are presented in Appendix 1 along with a plan of their positions.

The findings of the Dynamic Cone Penetrometer-CBR relationship tests are presented in Appendix 2 and those of the soakage test in Appendix 3.

4 LABORATORY TESTING

4.1 Scope

Laboratory testing for classification and chemical analyses was carried out on selected recovered samples. Testing was carried out by Newton Technology geomechanics laboratory, Dorchester, Dorset.

4.2 Classification - Particle Size Distribution

To classify the granular strata encountered, particle size distribution tests were carried out on seven samples.

4.3 Chemical Analysis

To assess the chemical aggressive nature of the ground, pH value and sulphate content analyses were carried out on four soil samples.

4.4 Results

The results of the tests and analyses are presented in Appendices 4 and 5.

5 GROUND CONDITIONS

5.1 Soils

The findings of the trial pits verified the published geology, namely Boyne Hollow Chert.

Superficial deposits of Topsoil were found to be present.

A summary of the ground conditions is given in the following table.

Stratum	Depth to Top of Stratum m bgl	Thickness Range m
TOPSOIL	0.00	0.30 - 0.35
BOYNE HOLLOW CHERT	0.30 - 0.35	Up to 2.95 (not proven beyond)

- ***Superficial Deposits***

Topsoil was encountered in all trial pits to a maximum depth of 0.35m.

These deposits comprised:

- Soft to firm slightly gravelly silt/clay.

- ***Boyne Hollow Chert***

Boyne Hollow Chert was encountered in all trial pits to a maximum depth of 3.30m.

These deposits comprised:

- Cobbles and boulders of strong SANDSTONE (locally weak and locally grading to chert) with finer material.

5.2 Groundwater

Groundwater was not encountered.

5.3 Excavated Material

The following photograph illustrates the nature of the Boyne Hollow Chert.

Trial Pit 10

6 DISCUSSION

6.1 Ground Conditions

The trial pit records and laboratory tests show the strata to comprise superficial deposits of TOPSOIL up to 0.35m depth overlying cobbles and boulders of strong SANDSTONE (locally weak and locally grading to chert) with finer material up to 3.30m [BOYNE HOLLOW CHERT].

Groundwater was not encountered.

6.2 Foundations

It is understood that raft and pad foundations are to be adopted.

Foundations should be taken down below any Topsoil into the Sandstone for which an allowable bearing pressure in excess of 400 kPa may be expected.

6.3 Road and Pavement Design

The CBR values derived from the Dynamic Cone Penetrometer-CBR relationship tests are presented in Appendix 2.

The following table provides a generic classification for guidance purposes only and not for design.

CBR VALUES FOR COMMONLY FOUND SUBGRADE CONDITIONS		
CBR Value %	**Subgrade Strength**	**Comments**
<3	Poor	Capping is required.
3 - 5	Normal	Capping considered according to road type.
5 - 15	Good	Capping may be necessary on very heavily trafficked roads.

At a nominal formation level of 0.50m, the CBR values were as follows.

Adjacent Trial Pit No	CBR Value %
7	24
8	16
10	55

6.4 Soakaways

The soakage test pit (Trial Pit 9) failed to empty to 25% within the test period of 8.3 hours, the maximum drainage achieved being 29%.

To provide an estimate of the rate of soil infiltration (f), the water depth-time curve was extrapolated to the 25% intercept.

$f = 5.5 \times 10^{-6}$ m/s

6.5 Chemical Attack on Sub-Surface Concrete

The results of the chemical analyses indicate water-soluble sulphate concentrations (as SO_4) of less than 0.01 g/l and near neutral to moderately alkaline ground conditions (pH 7.2 to 8.5).

In accordance with BRE Special Digest 1, the Design Sulphate (DS) and Aggressive Chemical Environment for Concrete (ACEC) classifications for the site are DS-1 and AC-1s respectively, for static groundwater conditions in a brownfield environment.

For the construction of new foundations, the recommendations given in the Digest for the design of buried concrete should be followed as appropriate.

TRIAL PIT RECORDS AND POSITION PLAN

Project Ref.	Client	**TRIAL PIT RECORD**
1986	**BV Dairy**	
Date: 08/09/09	Engineer: **Andrews Newby Partnership**	Trial Pit No. **7**
Coordinates: Not taken	Architect: **-**	
Ground Level: Not taken	Equipment and Methods: JCB 3CX Excavator	Sheet No. 1 of 1

Description of Strata	Thickness (m)	Depth (m)	Reduced Level (mOD)	Legend	Samples / Test: Depth (m)	Samples / Test: Type / No	Field Records
Rough grass over TOPSOIL comprising soft to firm dark brown sandy silt/clay with a little gravel of sandstone.	0.30	0.30			0.10 - 0.30	D1	
Cobbles and boulders of strong SANDSTONE with much finer material.	1.45	1.75			0.80 - 1.50	B2	
Thinly bedded cobbles and boulders of strong (locally weak) SANDSTONE with much finer material.	0.45	2.20			2.00 - 2.20	B3	
END OF TRIAL PIT @ 2.20m							

Remarks

1. Pit remained stable during excavation.
2. Groundwater was not encountered.
3. Unable to carry out Mackintosh Probe tests due to refusal.

Sample / Test Key

B = Large disturbed sample
D = Small disturbed sample
U = Undisturbed sample
W = Water sample
V = Vane test
HP = Hand Penetrometer test
MP = Mackintosh Probe test

Logged by: ais

Scale: 1=25

Project Ref. **1986**	Client **BV Dairy**	**TRIAL PIT RECORD**
Date 08/09/09	Engineer **Andrews Newby Partnership**	Trial Pit No. **8**
Coordinates Not taken	Architect **-**	
Ground Level Not taken	Equipment and Methods JCB 3CX Excavator	Sheet No. 1 of 1

Description of Strata	Thickness (m)	Depth (m)	Reduced Level (mOD)	Legend	Samples / Test Depth (m)	Samples / Test Type / No	Field Records
Rough grass over TOPSOIL comprising soft to firm dark brown sandy silt/clay with a little gravel of sandstone.	0.35				0.10 - 0.20	D1	
		0.35					
Cobbles and boulders of strong SANDSTONE with much finer material.	1.85				0.50 - 1.00	B2	
		2.20					
Thinly bedded poorly stratified cobbles and boulders of strong (locally weak) SANDSTONE with much finer material. Very strong and siliceous in part, and grading to chert.	1.10				2.50 - 3.30	B3	
END OF TRIAL PIT @ 3.30m							

Remarks
1. Pit remained stable during excavation.
2. Groundwater was not encountered.
3. Unable to carry out Mackintosh Probe tests due to refusal.

Sample / Test Key
B = Large disturbed sample
D = Small disturbed sample
U = Undisturbed sample
W = Water sample
V = Vane test
HP = Hand Penetrometer test
MP = Mackintosh Probe test

Logged by ais

Scale 1=25

Project Ref.	Client	**TRIAL PIT RECORD**
1986	**BV Dairy**	
Date: 08/09/09	Engineer: **Andrews Newby Partnership**	Trial Pit No. **9**
Coordinates: Not taken	Architect: **-**	
Ground Level: Not taken	Equipment and Methods: JCB 3CX Excavator	Sheet No. 1 of 1

Description of Strata	Thickness (m)	Depth (m)	Reduced Level (mOD)	Legend	Samples / Test: Depth (m)	Samples / Test: Type / No	Field Records
Rough grass over TOPSOIL comprising soft to firm dark brown sandy silt/clay with a little gravel of sandstone.	0.35	0.35			0.10 - 0.15	D1	
Cobbles and boulders of strong SANDSTONE with much finer material.	1.60				1.00 - 1.50	B2	
Cobbles and boulders of moderately strong SANDSTONE with much finer material (bedding surface at 1.95m bgl).	0.05	1.95 2.00			1.95 - 2.00	B3	
END OF TRIAL PIT @ 2.00m							

Remarks

1. Pit remained stable during excavation.
2. Groundwater was not encountered.
3. Unable to carry out Mackintosh Probe tests due to refusal.

Sample / Test Key

B = Large disturbed sample
D = Small disturbed sample
U = Undisturbed sample
W = Water sample
V = Vane test
HP = Hand Penetrometer test
MP = Mackintosh Probe test

Logged by: ais

Scale: 1=25

Project Ref. **1986**	Client **BV Dairy**	**TRIAL PIT RECORD**
Date 08/09/09	Engineer **Andrews Newby Partnership**	Trial Pit No. **10**
Coordinates Not taken	Architect **-**	
Ground Level Not taken	Equipment and Methods JCB 3CX Excavator	Sheet No. 1 of 1

Description of Strata	Thickness (m)	Depth (m)	Reduced Level (mOD)	Legend	Samples / Test Depth (m)	Samples / Test Type / No	Field Records
Rough grass over TOPSOIL comprising soft to firm dark brown sandy silt/clay with a little gravel of sandstone.	0.35	0.35			0.10 - 0.20	D1	
Slightly stratified cobbles and boulders of strong SANDSTONE with much finer material.	0.45	0.80					
Thinly bedded cobbles and boulders of strong (locally weak) SANDSTONE with much finer material and a little interstitial clay in joints and bedding surfaces.	1.30				1.00 - 1.50	B2	
END OF TRIAL PIT @ 2.10m		2.10					

Remarks
1. Pit remained stable during excavation.
2. Groundwater was not encountered.
3. Unable to carry out Mackintosh Probe tests due to refusal.

Sample / Test Key
B = Large disturbed sample
D = Small disturbed sample
U = Undisturbed sample
W = Water sample
V = Vane test
HP = Hand Penetrometer test
MP = Mackintosh Probe test

Logged by ais

Scale 1=25

- TP1–6 PREVIOUS TRIAL PITS
- TP7–10 PROPOSED TRIAL PITS +CBR

N

Grid and Levels to National Grid
Projection OSTN02 and OSGM02
Scale Factor = 1

123800 N
123750 N
123700 N
123650 N
123600 N
123550 N

387400 E
387450 E
387500 E
387550 E
387600 E
387650 E
387700 E

TP1
TP2
TP3
TP4
TP5
TP6
TP7 + CBR
TP8 + CBR
TP9
TP10 + CBR

BV Dairy

PROPOSED LOCATION OF NEW A.D. PLANT

MK	DATE	REVISION	BY

JOB TITLE: A.D. PLANT

CLIENT: B V DAIRY

SCALES: 1:500 | DRG. SIZE: A1

DATE: JULY 2009 | DRAWN: JRS | CHECKED:

DRAWING TITLE: PROPOSED SITE PLAN SHOWING PREVIOUS & PROPOSED TRIAL PITS

ANDREWS NEWBY PARTNERSHIP
CONSULTING STRUCTURAL & CIVIL ENGINEERS
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Buriton, Petersfield,
Hampshire.
GU31 5RX
Tel: (01730) 266944
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name@andrewsnewby.co.uk

DRAWING No. 2783/01

REVISION –

DYNAMIC CONE PENETROMETER-CBR RELATIONSHIP TESTS

LAND INVESTIGATIONS
GROUND SOLUTIONS

DYNAMIC CONE PENETROMETER-CBR RELATIONSHIP

TRANSPORT RESEARCH LABORATORY ROAD NOTES 8 & 31

Adjacent Trial Pit No	Anticipated Subgrade m	Test Level m	**DCP-CBR RELATIONSHIP** Log_{10} (CBR) = 2.480 - 1.057 x Log_{10} penetration (after TRL Road Note 8)
7	0.30	0.00	

Depth mm btl	**Penetration mm**	**Depth m bgl**	**CBR %**
0	0	0.00	-
117	51	0.12	4.7
168	36	0.17	6.8
204	25	0.20	10
229	8	0.23	34
237	4	0.24	70
241	5	0.24	55
246	8	0.25	34
254	5	0.25	55
259	7	0.26	39
266	6	0.27	45
272	6	0.27	45
278	8	0.28	34
286	8	0.29	34
294	9	0.29	30
303	8	0.30	34
311	8	0.31	34
319	10	0.32	26
329	16	0.33	16
345	13	0.35	20
358	14	0.36	19
372	10	0.37	26
382	6	0.38	45
388	9	0.39	30
397	6	0.40	45
403	8	0.40	34
411	9	0.41	30
420	8	0.42	34
428	10	0.43	26
438	9	0.44	30
447	3	0.45	95
450	13	0.45	20
463	6	0.46	45
469	10	0.47	26
479	9	0.48	30
488	11	0.49	24
499	11	0.50	24
510	10	0.51	26
520	10	0.52	26
530	10	0.53	26
540	12	0.54	22
552	20	0.55	13
572	17	0.57	15
589	16	0.59	16

Key	mm btl: mm below test level start depth m bgl: m below existing ground level

File	anp 9 is1a	Location	LI project	1986
Date	16/10/09	**AD PLANT, BV DAIRY WINCOMBE LANE, SHAFTESBURY**	Client ref	2783
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LAND INVESTIGATIONS
GROUND SOLUTIONS

DYNAMIC CONE PENETROMETER-CBR RELATIONSHIP

TRANSPORT RESEARCH LABORATORY ROAD NOTES 8 & 31

Adjacent Trial Pit No	Anticipated Subgrade m	Test Level m	**DCP-CBR RELATIONSHIP** Log_{10} (CBR) = 2.480 - 1.057 x Log_{10} penetration (after TRL Road Note 8)
7	0.30	0.00	

Depth mm btl	**Penetration mm**	**Depth m bgl**	**CBR %**
605	30	0.61	8.3
635	49	0.64	4.9
684	17	0.68	15
701	38	0.70	6.5
739	24	0.74	10
763	10	0.76	26
773	9	0.77	30
782	13	0.78	20
795	20	0.80	13
815	35	0.82	7.0

Key	mm btl: mm below test level start depth m bgl: m below existing ground level

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GROUND SOLUTIONS

DYNAMIC CONE PENETROMETER-CBR RELATIONSHIP

TRANSPORT RESEARCH LABORATORY ROAD NOTES 8 & 31

Adjacent Trial Pit No	Anticipated Subgrade m	Test Level m	DCP-CBR RELATIONSHIP
8	0.35	0.00	Log_{10} (CBR) = 2.480 - 1.057 x Log_{10} penetration (after TRL Road Note 8)

Depth mm btl	Penetration mm	Depth m bgl	CBR %
0	0	0.00	-
99	41	0.10	6.0
140	45	0.14	5.4
185	45	0.19	5.4
230	14	0.23	19
244	11	0.24	24
255	15	0.26	17
270	18	0.27	14
288	22	0.29	12
310	21	0.31	12
331	15	0.33	17
346	10	0.35	26
356	9	0.36	30
365	12	0.37	22
377	12	0.38	22
389	14	0.39	19
403	11	0.40	24
414	6	0.41	45
420	9	0.42	30
429	6	0.43	45
435	9	0.44	30
444	10	0.44	26
454	9	0.45	30
463	7	0.46	39
470	11	0.47	24
481	12	0.48	22
493	16	0.49	16
509	16	0.51	16
525	15	0.53	17
540	17	0.54	15
557	11	0.56	24
568	5	0.57	55
573	5	0.57	55
578	4	0.58	70
582	4	0.58	70
586	4	0.59	70
590	6	0.59	45
596	4	0.60	70
600	6	0.60	45
606	8	0.61	34
614	6	0.61	45
620	14	0.62	19
634	15	0.63	17
649	10	0.65	26

Key	mm btl: mm below test level start depth m bgl: m below existing ground level

File	anp 9 is2a	Location	LI project	1986
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DYNAMIC CONE PENETROMETER-CBR RELATIONSHIP

TRANSPORT RESEARCH LABORATORY ROAD NOTES 8 & 31

Adjacent Trial Pit No	Anticipated Subgrade m	Test Level m	DCP-CBR RELATIONSHIP
8	0.35	0.00	Log_{10} (CBR) = 2.480 - 1.057 x Log_{10} penetration (after TRL Road Note 8)

Depth mm btl	Penetration mm	Depth m bgl	CBR %
659	10	0.66	26
669	14	0.67	19
683	17	0.68	15
700	26	0.70	9.6
726	11	0.73	24
737	12	0.74	22
749	8	0.75	34
757	8	0.76	34
765	4	0.77	70
769	8	0.77	34
777	26	0.78	9.6
803	27	0.80	9.3
830	20	0.83	13

Key	mm btl: mm below test level start depth m bgl: m below existing ground level

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GROUND SOLUTIONS

DYNAMIC CONE PENETROMETER-CBR RELATIONSHIP

TRANSPORT RESEARCH LABORATORY ROAD NOTES 8 & 31

Adjacent Trial Pit No	Anticipated Subgrade m	Test Level m	DCP-CBR RELATIONSHIP
10	0.30	0.00	Log_{10} (CBR) = 2.480 - 1.057 x Log_{10} penetration (after TRL Road Note 8)

Depth mm btl	Penetration mm	Depth m bgl	CBR %
0	0	0.00	-
115	49	0.12	4.9
164	20	0.16	13
184	15	0.18	17
199	15	0.20	17
214	14	0.21	19
228	14	0.23	19
242	15	0.24	17
257	8	0.26	34
265	10	0.27	26
275	9	0.28	30
284	10	0.28	26
294	11	0.29	24
305	5	0.31	55
310	6	0.31	45
316	10	0.32	26
326	12	0.33	22
338	15	0.34	17
353	14	0.35	19
367	10	0.37	26
377	8	0.38	34
385	10	0.39	26
395	19	0.40	13
414	25	0.41	10
439	4	0.44	70
443	4	0.44	70
447	5	0.45	55
452	3	0.45	95
455	5	0.46	55
460	5	0.46	55
465	5	0.47	55
470	4	0.47	70
474	5	0.47	55
479	4	0.48	70
483	4	0.48	70
487	6	0.49	45
493	4	0.49	70
497	7	0.50	39
504	5	0.50	55
509	6	0.51	45
515	6	0.52	45
521	4	0.52	70
525	8	0.53	34
533	3	0.53	95

Key	mm btl: mm below test level start depth m bgl: m below existing ground level

File	anp 9 is3a	Location	LI project	1986
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Adjacent Trial Pit No	Anticipated Subgrade m	Test Level m	DCP-CBR RELATIONSHIP
10	0.30	0.00	Log_{10} (CBR) = 2.480 - 1.057 x Log_{10} penetration (after TRL Road Note 8)

Depth mm btl	Penetration mm	Depth m bgl	CBR %
536	7	0.54	39
543	6	0.54	45
549	5	0.55	55
554	5	0.55	55
559	5	0.56	55
564	3	0.56	95
567	5	0.57	55
572	4	0.57	70
576	4	0.58	70
580	5	0.58	55
585	4	0.59	70
589	2	0.59	>100
591	3	0.59	95
594	1	0.59	>100
595	3	0.60	95
598	1	0.60	>100

Key	mm btl: mm below test level start depth m bgl: m below existing ground level

File	anp 9 is3b	Location	LI project	1986
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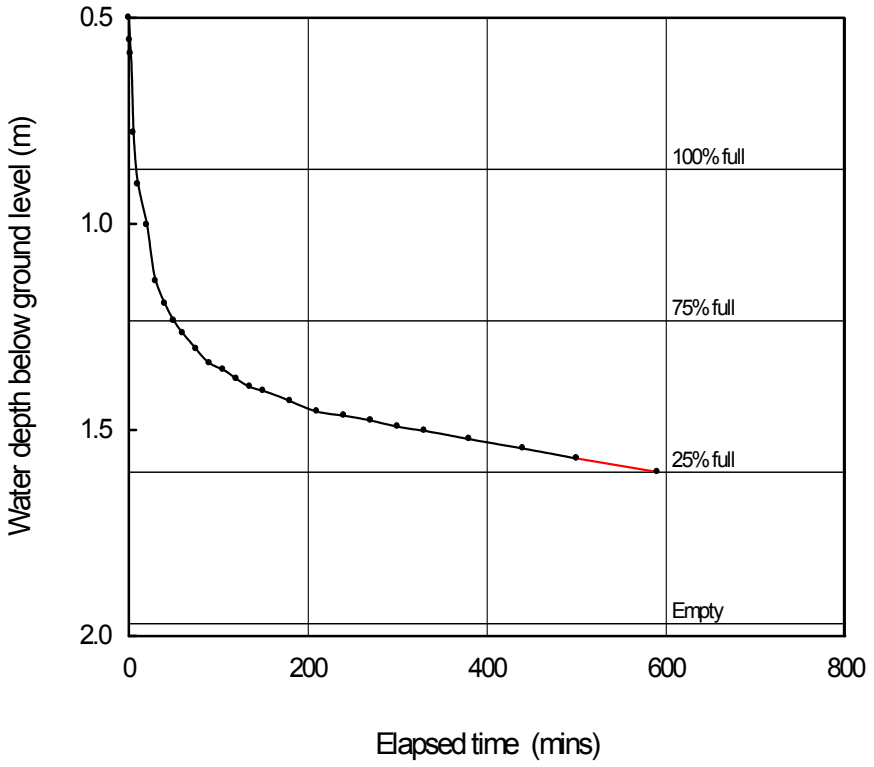
RESULTS OF SOAKAGE TEST

DETERMINATION OF SOIL INFILTRATION RATE

Building Research Establishment Digest 365



0.00 - 0.35m
Rough grass over TOPSOIL comprising soft to firm dark brown sandy silt/clay with a little gravel of sandstone.

0.35 - 1.95m
Cobbles and boulders of SANDSTONE with much finer material.

1.95 - 2.00m
Cobbles and boulders of moderately strong SANDSTONE with much finer material (bedding surfaces at 1.95m bgl).

Trial pit dimensions	m	Length = 1.99	Width = 0.61	Depth = 1.97
Change in water level	m	Initial = 0.500	Final = 1.569	Change = 1.069
Elapsed time	mins	100% full = 0	75% full = 50	25% full = 590[1]
75% / 25% levels	m	25% increment = 0.3675	75% full = 0.8675	25% full = 1.6025
Outflow volume	V_{p75}	1.99 x 0.61 x (1.6025 - 0.8675) = 0.89 m^3		
Mean surface area	a_{p50}	(1.99 x 0.735 x 2) + (0.61 x 0.735 x 2) + (1.99 x 0.61) = 5.04 m^2		
Outflow time	t_{p75-25}	590 - 50 = 540 mins		
Soil infiltration rate	**f**	$V_{p75} / (a_{p50} \times t_{p75-25} \times 60)$ = **5.5 x 10^{-6} m/s**		
Comments		1. The pit did not empty to 25% within the test period (8.3 hours). The soil infiltration is estimated by extrapolation of the depth-time curve.		

File	anp 9 is4	Location	Trial Pit No	9
Date	15/10/09	**AD PLANT, BV DAIRY WINCOMBE LANE, SHAFTESBURY**	Project Ref	1986
Approved	PAB		Page	1 of 1

Unit 1B Station Road Maiden Newton DORCHESTER DT2 0AE Telephone 01300 321 362 Facsimile 01300 320 326

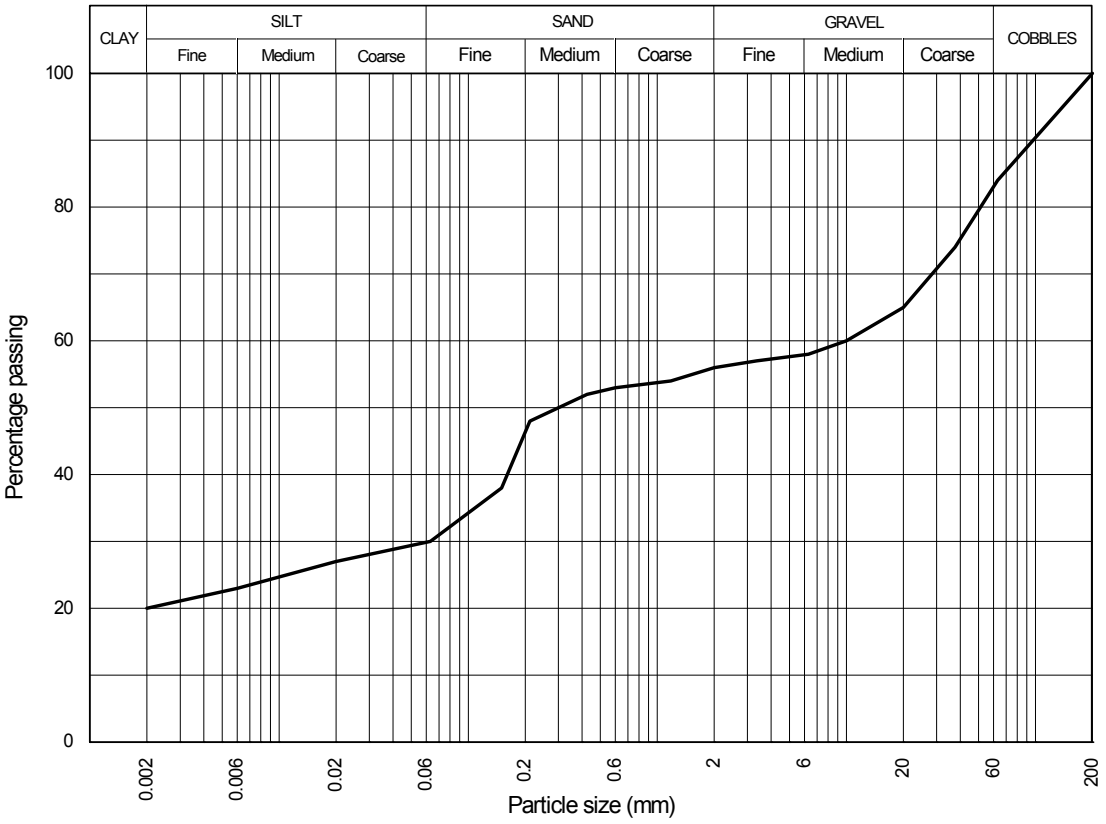
RESULTS OF LABORATORY GEOTECHNICAL TESTS

Newton Technology
Geomechanics Laboratory

PARTICLE SIZE DISTRIBUTION BY WET SIEVING and SEDIMENTATION

BS 1377 : Part 2 : 1990

Report of analysis			Laboratory tests on soil samples
Trial Pit No	Sample Type	Depth m	Description
7	B	0.8 – 1.5	Brown clayey silty cobbly SAND and GRAVEL.



GRADATION		
Sieve mm	Retained %	Passing %
63.00	16	84
37.50	10	74
20.00	9	65
10.00	5	60
6.30	2	58
3.35	1	57
2.00	1	56
1.18	2	54
0.600	1	53
0.425	1	52
0.212	4	48
0.150	10	38
0.063	8	30
0.020	3	27
0.006	4	23
0.002	3	20

COMPOSITION	
Size Fraction	Proportion %
Cobbles	16
Gravel	28
Sand	26
Silt	10
Clay	20

COEFFICIENTS	
Uniformity	>5193
Curvature	>0.2

Samples	B : Bulk sample D : Small disturbed
Key	BS : British Standard

File	anp 9 p1	Location	NTL project	11326
Date	07/10/09	**AD PLANT, BV DAIRY WINCOMBE LANE, SHAFTESBURY**	LI project	1986
Approved	MW		Page	1 of 7

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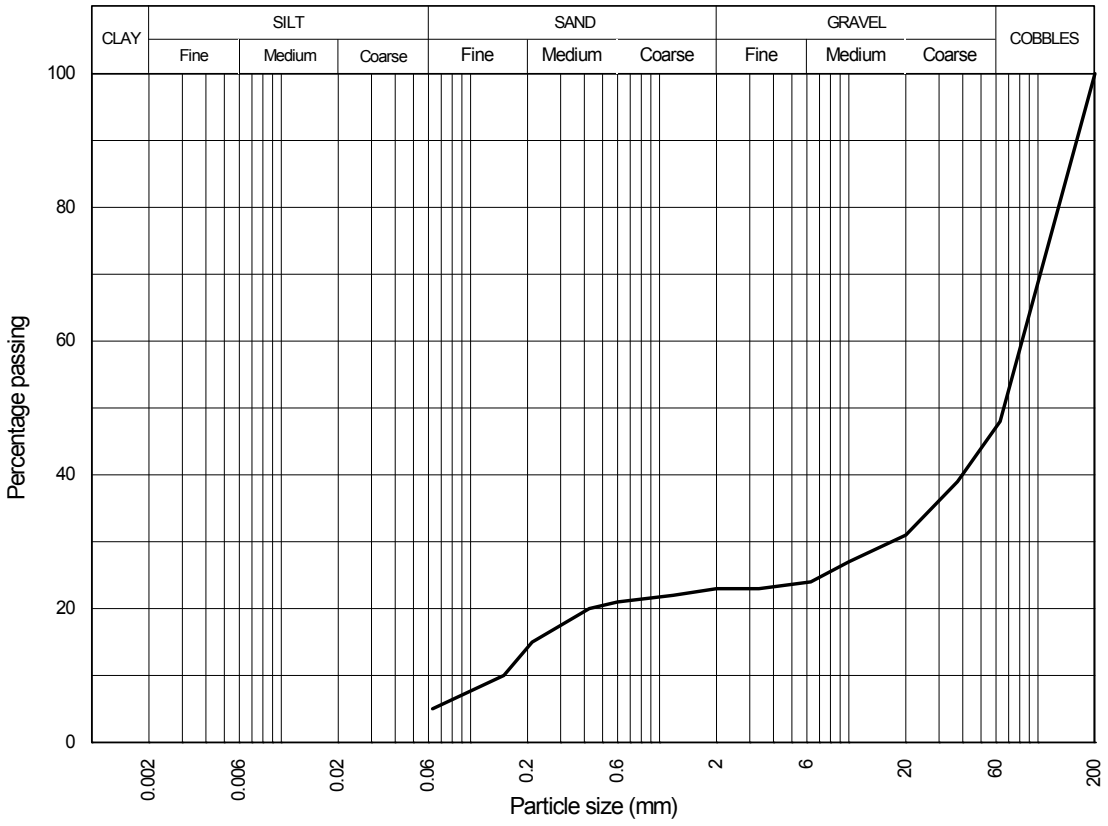
Newton Technology
Geomechanics Laboratory

PARTICLE SIZE DISTRIBUTION BY WET SIEVING

BS 1377 : Part 2 : 1990

Report of analysis	Laboratory tests on soil samples

Trial Pit No	Sample Type	Depth m	Description
7	B	2.0 – 2.2	Olive brown slightly silty sandy very gravelly COBBLES.



GRADATION		
Sieve mm	Retained %	Passing %
63.00	52	48
37.50	9	39
20.00	8	31
10.00	4	27
6.30	3	24
3.35	1	23
2.00	0	23
1.18	1	22
0.600	1	21
0.425	1	20
0.212	5	15
0.150	5	10
0.063	5	5

COMPOSITION	
Size Fraction	Proportion %
Cobbles	52
Gravel	25
Sand	18
Silt	5

COEFFICIENTS	
Uniformity	534
Curvature	21

Sample	B : Bulk disturbed D : Small disturbed
Key	BS : British Standard

File	anp 9 p2	Location	NTL project	11326
Date	07/10/09	**AD PLANT, BV DAIRY WINCOMBE LANE, SHAFTESBURY**	LI project	1986
Approved	MW		Page	2 of 7

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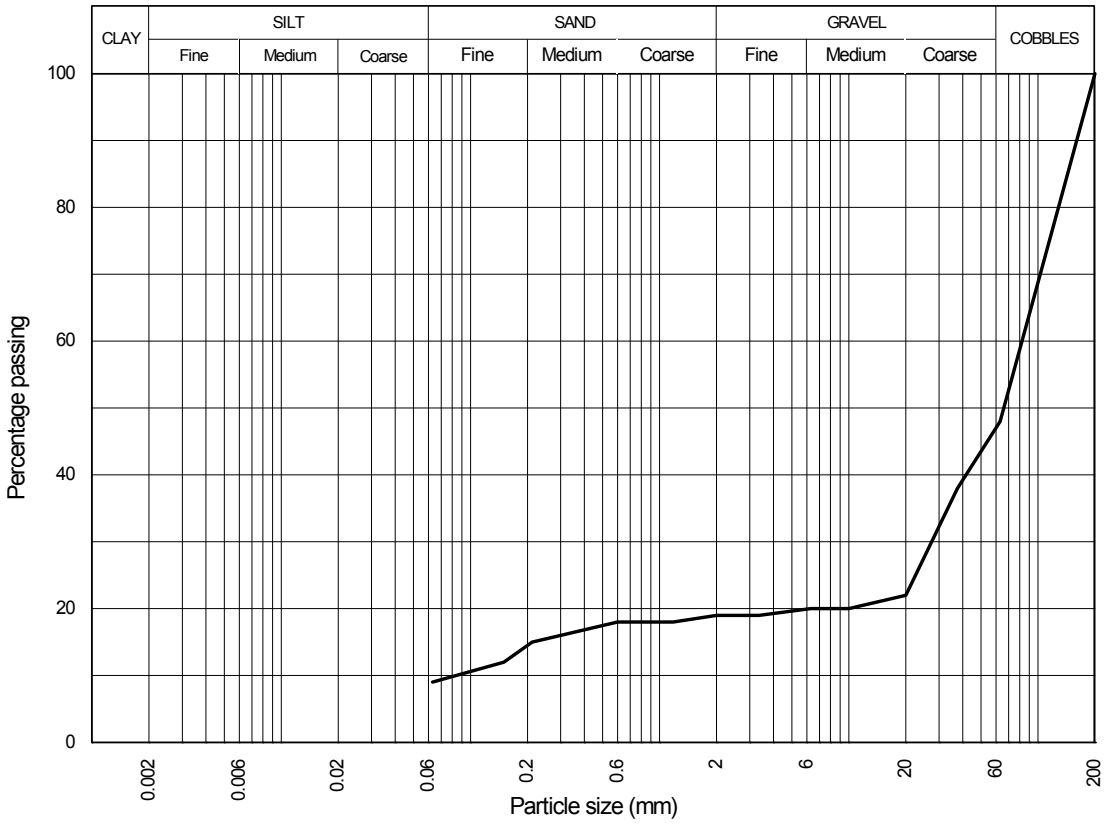
PARTICLE SIZE DISTRIBUTION BY WET SIEVING

BS 1377 : Part 2 : 1990

Report of analysis	Laboratory tests on soil samples

Trial Pit No	Sample Type	Depth m	Description
8	B	0.5 – 1.0	Brown silty sandy very gravelly COBBLES.



GRADATION		
Sieve mm	Retained %	Passing %
63.00	52	48
37.50	10	38
20.00	16	22
10.00	2	20
6.30	0	20
3.35	1	19
2.00	0	19
1.18	1	18
0.600	0	18
0.425	1	17
0.212	2	15
0.150	3	12
0.063	3	9

COMPOSITION	
Size Fraction	Proportion %
Cobbles	52
Gravel	29
Sand	10
Silt	9

COEFFICIENTS	
Uniformity	1066
Curvature	123

Sample	B : Bulk disturbed D : Small disturbed
Key	BS : British Standard

File	anp 9 p3	Location	NTL project	11326
Date	07/10/09	**AD PLANT, BV DAIRY WINCOMBE LANE, SHAFTESBURY**	LI project	1986
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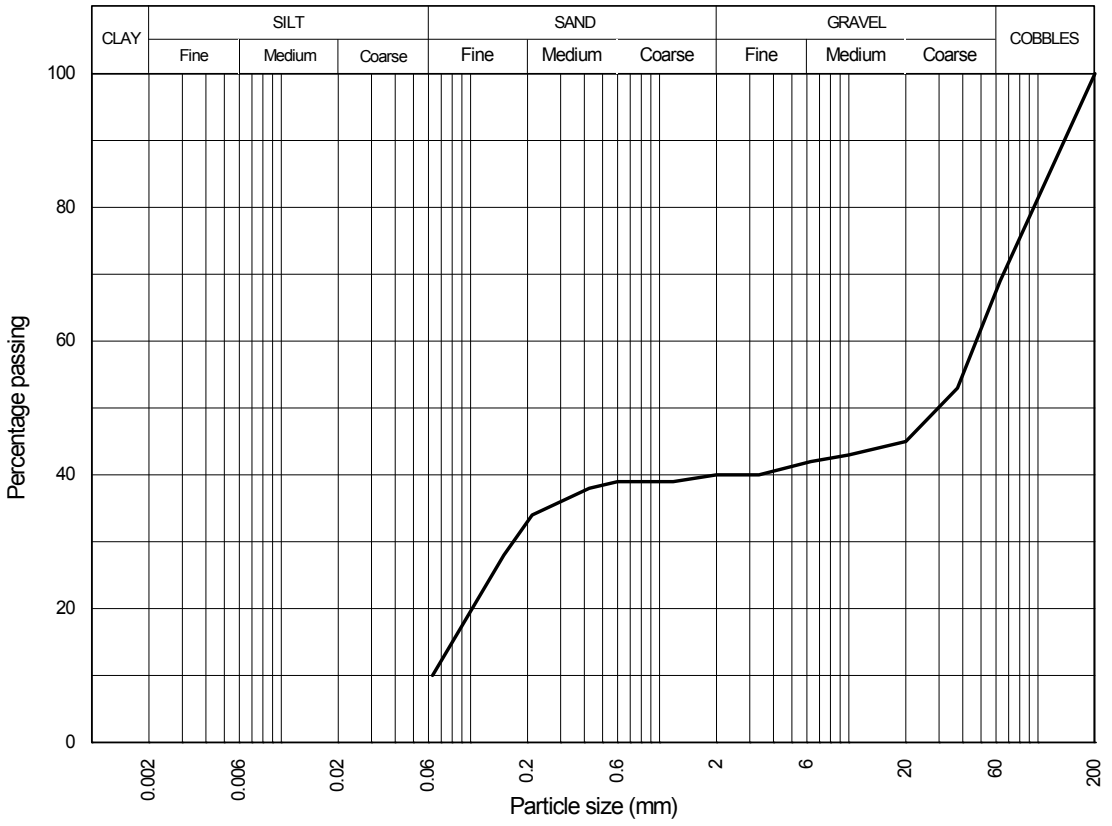
Newton Technology
Geomechanics Laboratory

PARTICLE SIZE DISTRIBUTION BY WET SIEVING

BS 1377 : Part 2 : 1990

Report of analysis	Laboratory tests on soil samples

Trial Pit No	Sample Type	Depth m	Description
8	B	2.5 – 3.3	Olive silty SAND, GRAVEL and COBBLES.



GRADATION		
Sieve mm	Retained %	Passing %
63.00	31	69
37.50	16	53
20.00	8	45
10.00	2	43
6.30	1	42
3.35	2	40
2.00	0	40
1.18	1	39
0.600	0	39
0.425	1	38
0.212	4	34
0.150	6	28
0.063	18	10

COMPOSITION	
Size Fraction	Proportion %
Cobbles	31
Gravel	29
Sand	30
Silt	10

COEFFICIENTS	
Uniformity	722
Curvature	0

Sample	B : Bulk disturbed D : Small disturbed
Key	BS : British Standard

File	anp 9 p4	Location	NTL project	11326
Date	07/10/09	**AD PLANT, BV DAIRY WINCOMBE LANE, SHAFTESBURY**	LI project	1986
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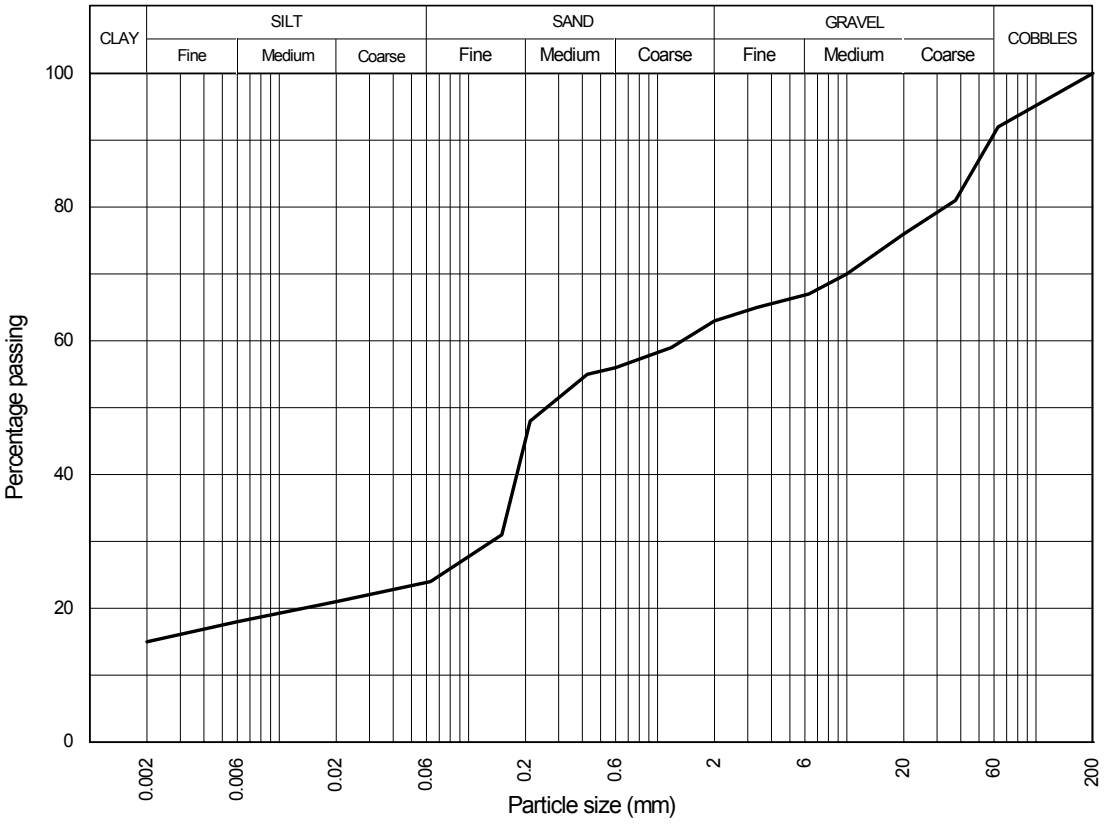
Newton Technology
Geomechanics Laboratory

PARTICLE SIZE DISTRIBUTION
BY WET SIEVING and SEDIMENTATION

BS 1377 : Part 2 : 1990

Report of analysis			Laboratory tests on soil samples
Trial Pit No	Sample Type	Depth m	Description
9	B	1.0 – 1.5	Yellowish brown clayey silty cobbly very gravelly SAND.



GRADATION		
Sieve mm	Retained %	Passing %
63.00	8	92
37.50	11	81
20.00	5	76
10.00	6	70
6.30	3	67
3.35	2	65
2.00	2	63
1.18	4	59
0.600	3	56
0.425	1	55
0.212	7	48
0.150	17	31
0.063	7	24
0.020	3	21
0.006	3	18
0.002	3	15

COMPOSITION	
Size Fraction	Proportion %
Cobbles	8
Gravel	29
Sand	39
Silt	9
Clay	15

COEFFICIENTS	
Uniformity	>671
Curvature	>6.2

Samples	B : Bulk sample D : Small disturbed
Key	BS : British Standard

File	anp 9 p5	Location	NTL project	11326
Date	07/10/09	**AD PLANT, BV DAIRY WINCOMBE LANE, SHAFTESBURY**	LI project	1986
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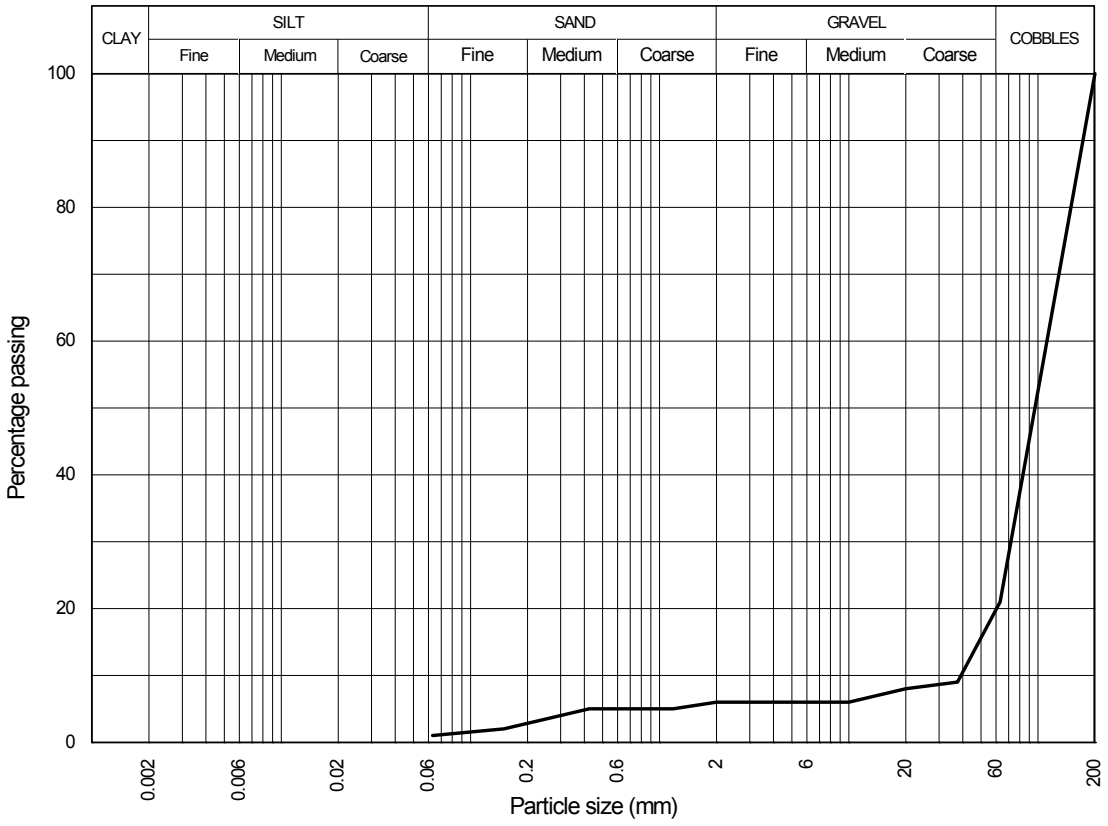
Newton Technology
Geomechanics Laboratory

PARTICLE SIZE DISTRIBUTION BY WET SIEVING

BS 1377 : Part 2 : 1990

Report of analysis	Laboratory tests on soil samples

Trial Pit No	Sample Type	Depth m	Description
9	B	1.95 – 2.0	Olive slightly sandy gravelly COBBLES.



GRADATION		
Sieve mm	Retained %	Passing %
63.00	79	21
37.50	12	9
20.00	1	8
10.00	2	6
6.30	0	6
3.35	0	6
2.00	0	6
1.18	1	5
0.600	0	5
0.425	0	5
0.212	2	3
0.150	1	2
0.063	1	1

COMPOSITION	
Size Fraction	Proportion %
Cobbles	79
Gravel	15
Sand	5
Silt	1

COEFFICIENTS	
Uniformity	2.8
Curvature	1.2

Sample	B : Bulk disturbed D : Small disturbed
Key	BS : British Standard

File	anp 9 p6	Location	NTL project	11326
Date	07/10/09	**AD PLANT, BV DAIRY WINCOMBE LANE, SHAFTESBURY**	LI project	1986
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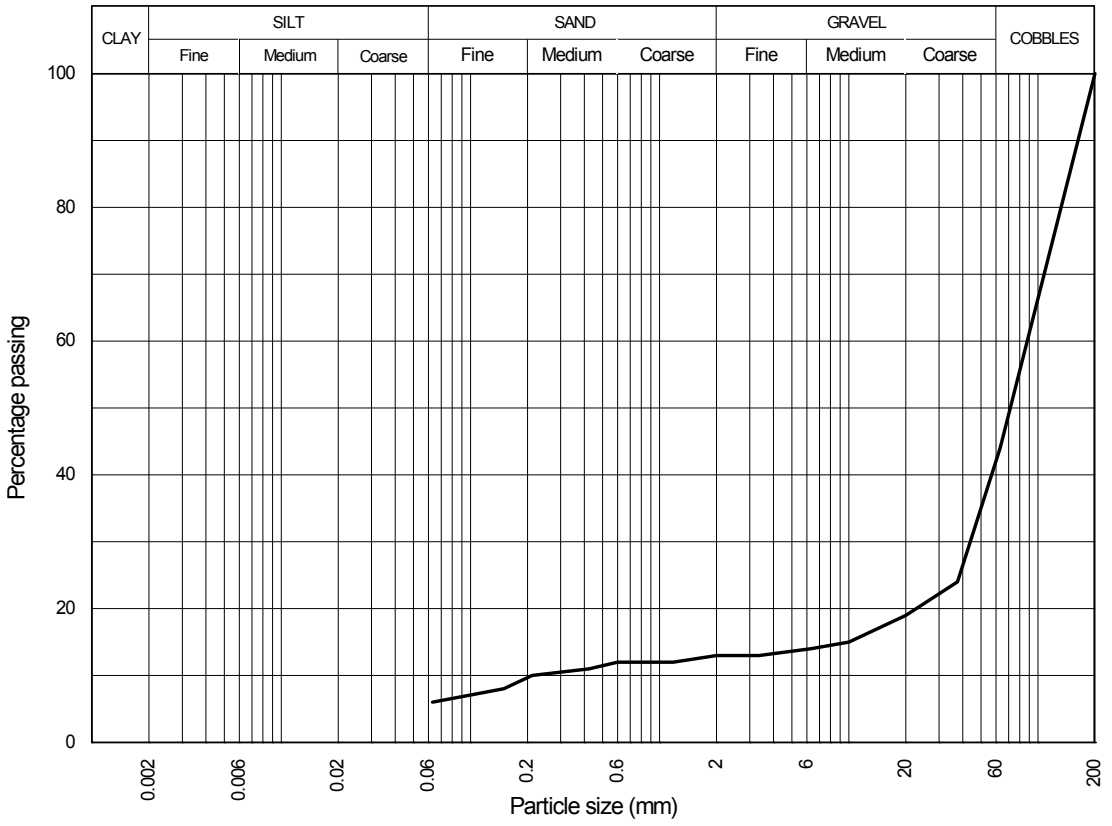
PARTICLE SIZE DISTRIBUTION BY WET SIEVING

BS 1377 : Part 2 : 1990

Report of analysis	Laboratory tests on soil samples

Trial Pit No	Sample Type	Depth m	Description
10	B	1.0 – 1.5	Light olive brown silty sandy very gravelly COBBLES.



GRADATION		
Sieve mm	Retained %	Passing %
63.00	56	44
37.50	20	24
20.00	5	19
10.00	4	15
6.30	1	14
3.35	1	13
2.00	0	13
1.18	1	12
0.600	0	12
0.425	1	11
0.212	1	10
0.150	2	8
0.063	2	6

COMPOSITION	
Size Fraction	Proportion %
Cobbles	56
Gravel	31
Sand	7
Silt	6

COEFFICIENTS	
Uniformity	358
Curvature	88

Sample	B : Bulk disturbed D : Small disturbed
Key	BS : British Standard

File	anp 9 p7	Location	NTL project	11326
Date	07/10/09	**AD PLANT, BV DAIRY WINCOMBE LANE, SHAFTESBURY**	LI project	1986
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RESULTS OF LABORATORY CHEMICAL ANALYSES

Newton Technology
Geomechanics Laboratory

SULPHATE CONTENT / pH

BS 1377 : Part 3 : 1990

Report of analysis	Laboratory tests on soil samples

Trial Pit No	Sample Type	Depth m	Water-soluble sulphate g/l SO_4	pH
7	B	2.0 – 2.2	<0.01	7.7
8	B	0.5 – 1.0	<0.01	7.2
9	B	1.95 – 2.0	<0.01	7.7
10	B	1.0 – 1.5	<0.01	8.5

Samples	B : Bulk disturbed D : Small disturbed
Note	Sulphate as SO_4 is reported for classification in accordance with BRE Special Digest 1, 2005.
Key	BRE : Building Research Establishment.
	BS : British Standard.

File	anp 9 s	Location	NTL project	11326
Date	07/10/09	**AD PLANT, BV DAIRY WINCOMBE LANE, SHAFTESBURY**	LI project	1986
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REFERENCES

REFERENCES

PUBLISHED GEOLOGY

Geological Maps of England and Wales; *Sheet 313 - Shaftesbury, Solid and Drift Edition;* British Geological Survey.

GROUND INVESTIGATION

British Standards Institution; *Code of practice for site investigations;* BS 5930:1990.

Transport Research Laboratory; *A users manual for a program to analyse dynamic cone penetrometer data;* Overseas Road Note 8.

Transport Research Laboratory; *A guide to the structural design of bitumen-surfaced roads in tropical and sub-tropical countries;* Overseas Road Note 31.

LABORATORY TESTING

British Standards Institution; *Soils for civil engineering purposes;* BS 1377:1990.

DISCUSSION

Atkinson MF; *Structural foundations manual for low-rise buildings.*

Building Research Establishment; *Concrete in aggressive ground;* BRE Special Digest 1:2005.

Tomlinson M J; *Foundation design and construction.*