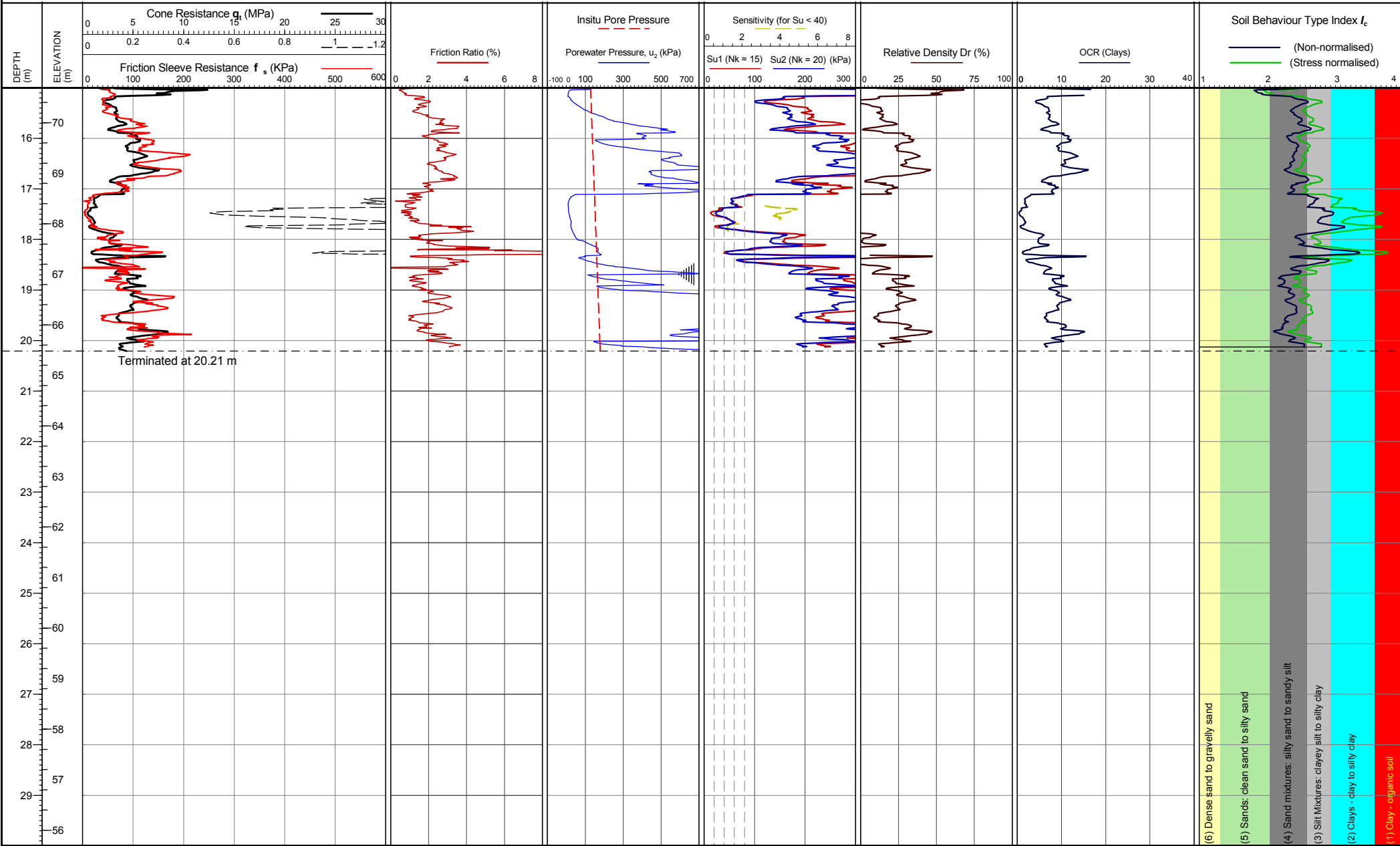


Client: DELTA SIMONS

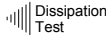
Project: WELWYN GARDEN CITY



Cone area (mm²):1500
ConeID: S15-CFIP.843
Operator: Ben Ranson
Rig Used: UK15
Date of test: 23/10/2014 12:46:36

Location: Hertfordshire
Coordinates: 524056.3, 212880.65
Elevation: 85.69
Coordinate system:

Remarks: *Piezometric surface origin: Est. from u2 piezo data
Termination Remark:
Target depth



Both drained and undrained parameters are calculated for mixed SBTs = I_c 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.
See report section 'Interpretative Data' for methods and discussion of parameter evaluation.

Date of plot: 28-10-14
Lankelma Project Ref: P-106006-1
Checked by: Emma Stickland

TEST ID: CPT408B

Page 2 of 2



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Email: info@deltasimons.com



| | | | | | |
|--------------------------------------|--|-------------|----------------|-----------------------------------|---------------|
| Project: | Broadwater Road, Welwyn Garden City | Project No: | 2342.18 | Hole ID: | CPT401 |
| ROTARY OPEN HOLE BOREHOLE LOG | | | Date: | Client: | |
| | | | | Spen Hill Developments Ltd | |

| Description Of Strata | Legend | Water | Casing Depth / (Diam. mm) Date | Reduced Level / Depth (Thickness) | Flush Return % | Core Recovery | | | | Depth / Core Length | Sample Details | | Test Results | Backfill Details |
|---|--------|-------|--------------------------------|-----------------------------------|----------------|---------------|-------|-------|--|---------------------|----------------|------|----------------------|------------------|
| | | | | | | TCR % | SCR % | RCD % | | | Type | Ref. | SPT N Value/Drive mm | |
| MADE GROUND: Concrete. | | | | 84.36 0.20 | | | | | | | | | | |
| MADE GROUND: Fine to coarse gravel. | | | | 84.26 0.30 | | | | | | | | | | |
| Orange gravelly CLAY. (LOWESTOFT FORMATION). | | | | (4.20) | | | | | | | | | | |
| | | | | 80.06 4.50 | | | | | | | | | | |
| Orange brown gravelly SAND with bands of clay. (LOWESTOFT FORMATION). | | | | (2.80) | | | | | | | | | | |
| | | | | 77.26 7.30 | | | | | | | | | | |
| Soft to firm brown gravelly sandy CLAY. (KESGRAVE CATHMENT SUBGROUP). | | | | (2.30) | | | | | | | | | | |
| | | | | 74.96 9.60 | | | | | | | | | | |
| Borehole complete at 9.60m bgl. | | | | | | | | | | | | | | |

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Backfilled with arisings.

WATER LEVEL OBSERVATIONS

| Date | Time | Water Strike | Standing Level | Casing Depth |
|------|------|--------------|----------------|--------------|
| | | | | |
| | | | | |
| | | | | |

NO WATER ENCOUNTERED:

| | | | | |
|--|--|---|----------------|-----------------|
| All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum | | Page 1 of 1 |
| Plant Used: Dando 2000 | Coordinates / Level (mAOD): E: 524113.58 N: 212667.21 Level: 84.56 | Logged By: WC | Checked By: WC | Approved By: SS |

| | | | | | | | | | | | | | | |
|--|--|--|--|--|----------------------------|--|--|--|--|---|--|--|--|--|
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| Project: Broadwater Road, Welwyn Garden City | | | | | Project No: 2342.18 | | | | | Hole ID: CPT402 | | | | |
| ROTARY OPEN HOLE BOREHOLE LOG | | | | | Date: | | | | | Client: Spen Hill Developments Ltd | | | | |

| Description Of Strata | Legend | Water | Casing Depth / (Diam. mm) Date | Reduced Level / Depth (Thickness) | Flush Return % | Core Recovery | | | | Depth / Core Length | Sample Details | | Test Results SPT N Value/Drive mm | Backfill Details |
|--|--------|-------|--------------------------------------|---|-------------------|---------------|----------|----------|------|------------------------|----------------|--|--------------------------------------|---------------------|
| | | | | | | TCR % | SCR % | RCD % | Ref. | | Type | | | |
| MADE GROUND: Concrete. | XXXX | | | 84.26 0.20 84.16 0.30 | | | | | | | | | | |
| MADE GROUND: Gravel. Orange slightly gravelly CLAY. (LOWESTOFT FORMATION). | XXXXXX | | | (3.20) | | | | | | | | | | |
| Orange SAND. (LOWESTOFT FORMATION). | XXXXXX | | | 80.96 3.50 (1.50) | | | | | | | | | | |
| Soft brown sandy CLAY. (LOWESTOFT FORMATION). | XXXXXX | | | 79.46 5.00 (2.40) | | | | | | | | | | |
| Clayey gravelly SAND. (POSSIBLE KESGRAVE CATHMENT SUBGROUP). | XXXXXX | | | 77.06 7.40 (0.70) | | | | | | | | | | |
| CLAY. (POSSIBLE KESGRAVE CATHMENT SUBGROUP). | XXXXXX | | | 76.36 8.10 (0.90) | | | | | | | | | | |
| Borehole complete at 9.00m bgl. | | | | 75.46 9.00 | | | | | | | | | | |

REMARKS :

- Engineer verified logged in general accordance to BS 5930:2010.
- Area CAT scanned prior to excavation.
- Borehole remained dry on completion.
- Backfilled with arisings.

WATER LEVEL OBSERVATIONS

| Date | Time | Water Strike | Standing Level | Casing Depth |
|-----------------------|------|--------------|----------------|--------------|
| NO WATER ENCOUNTERED: | | | | |

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|--|--|--|---|
| All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum | Page 1 of 1 |
| Plant Used: Dando 2000 | Coordinates / Level (mAOD): E: 524164.75 N: 212638.96 Level: 84.46 | Logged By: WC | Checked By: WC Approved By: SS |

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| | | |
|--|-------------------------------|--|
| Project: Broadwater Road, Welwyn Garden City | Project No: 2342.18 | Hole ID: CPT403 |
| ROTARY OPEN HOLE BOREHOLE LOG | Date: | Client: Spen Hill Developments Ltd |

| Description Of Strata | Legend | Water | Casing Depth / (Diam. mm) Date | Reduced Level / Depth (Thickness) | Flush Return % | Core Recovery | | | | Depth / Core Length | Sample Details | | Test Results | Backfill Details |
|--|--------|-------|--------------------------------|-----------------------------------|----------------|---------------|-------|-------|-------|---------------------|----------------|------|----------------------|------------------|
| | | | | | | TCR % | SCR % | RCD % | RCD % | | Type | Ref. | SPT N Value/Drive mm | |
| MADE GROUND: Concrete. | | | | 84.17 0.30 | | | | | | | | | | |
| Orange brown gravelly CLAY. (LOWESTOFT FORMATION). | | | | (2.80) | | | | | | | | | | |
| Brown gravelly SAND. (LOWESTOFT FORMATION). | | | | 81.37 3.10 | | | | | | | | | | |
| | | | | (2.10) | | | | | | | | | | |
| Brown sandy gravelly CLAY. (POSSIBLE KESGRAVE CATHMENT SUBGROUP). | | | | 79.27 5.20 | | | | | | | | | | |
| | | | | (3.80) | | | | | | | | | | |
| | | | | 75.47 9.00 | | | | | | | | | | |
| Borehole complete at 9.00m bgl. | | | | | | | | | | | | | | |

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Backfilled with arisings.

WATER LEVEL OBSERVATIONS

| Date | Time | Water Strike | Standing Level | Casing Depth |
|------|------|--------------|----------------|--------------|
| | | | | |
| | | | | |
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NO WATER ENCOUNTERED:

| | | | |
|--|--|---|---|
| All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum | Page 1 of 1 |
| Plant Used: Dando 2000 | Coordinates / Level (mAOD): E: 524176.08 N: 212732.72 Level: 84.47 | Logged By: WC | Checked By: WC Approved By: SS |

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Project: **Broadwater Road, Welwyn Garden City** Project No: **2342.18** Hole ID: **CPT404**

ROTARY OPEN HOLE BOREHOLE LOG

Date: Client: **Spen Hill Developments Ltd**

| Description Of Strata | Legend | Water | Casing Depth / (Diam. mm) Date | Reduced Level / Depth (Thickness) | Flush Return % | Core Recovery | | | | Depth / Core Length | Sample Details | | Test Results | Backfill Details |
|---|--------|-------|--------------------------------|-----------------------------------|----------------|---------------|-------|-------|--------------------|---------------------|----------------|------|----------------------|------------------|
| | | | | | | TCR % | SCR % | RCD % | RCD % ² | | Type | Ref. | SPT N Value/Drive mm | |
| MADE GROUND: Asphalt. | | | | 84.00 0.15 | | | | | | | | | | |
| MADE GROUND: Gravelly clay. (FILL) | | | | 83.80 0.35 | | | | | | | | | | |
| Soft to firm gravelly CLAY. (LOWESTOFT FORMATION). | | | | (1.15) | | | | | | | | | | |
| | | | | 82.65 1.50 | | | | | | | | | | |
| Sandy fine to coarse GRAVEL. (LOWESTOFT FORMATION). | | | | (1.50) | | | | | | | | | | |
| | | | | 81.15 3.00 | | | | | | | | | | |
| Soft to firm gravelly CLAY. (LOWESTOFT FORMATION). | | | | (5.50) | | | | | | | | | | |
| | | | | 75.65 8.50 | | | | | | | | | | |
| Borehole complete at 8.50m bgl. | | | | | | | | | | | | | | |

REMARKS :

- Engineer verified logged in general accordance to BS 5930:2010.
- Area CAT scanned prior to excavation.
- Borehole remained dry on completion.
- Backfilled with arisings.

WATER LEVEL OBSERVATIONS

| Date | Time | Water Strike | Standing Level | Casing Depth |
|------|------|--------------|----------------|--------------|
| | | | | |
| | | | | |
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NO WATER ENCOUNTERED:

| | | | |
|--|---|---|--------------------------------|
| All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum | Page 1 of 1 |
| Plant Used: Dando 2000 | Coordinates / Level (mAOD): E: 524256.84 N: 213021.7 Level: 84.15 | Logged By: WC | Checked By: WC Approved By: SS |

| | | | | | | | | | | | | | | |
|--|--|--|--|--|----------------------------|--|--|--|--|---|--|--|--|--|
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| Project: Broadwater Road, Welwyn Garden City | | | | | Project No: 2342.18 | | | | | Hole ID: CPT405 | | | | |
| ROTARY OPEN HOLE BOREHOLE LOG | | | | | Date: | | | | | Client: Spen Hill Developments Ltd | | | | |

| Description Of Strata | Legend | Water | Casing Depth / (Diam. mm) Date | Reduced Level / Depth (Thickness) | Flush Return % | Core Recovery | | | | Depth / Core Length | Sample Details | | Test Results SPT N Value/Drive mm | Backfill Details | |
|--|--------|-------|-----------------------------------|-----------------------------------|----------------|---------------|-------|-------|-------|---------------------|----------------|------|--------------------------------------|------------------|--|
| | | | | | | TCR % | SCR % | RCD % | RQD % | | Type | Ref. | | | |
| MADE GROUND: Concrete. | XXXX | | | 84.36 0.30 | | | | | | | | | | | |
| Soft slightly gravelly sandy CLAY. (LOWESTOFT FORMATION). | XXXXXX | | | (6.70) | | | | | | | | | | | |
| Soft to firm gravelly sandy CLAY. (POSSIBLE KESGRAVE CATHMENT SUBGROUP). | XXXXXX | | | (2.00) | | | | | | | | | | | |
| Borehole complete at 9.00m bgl. | | | | 75.66 9.00 | | | | | | | | | | | |

| | | | | | | |
|---|--------------------------|------|------|--------------|----------------|--------------|
| REMARKS : 1. Engineer verified logged in general accordance to BS 5930:2010. 2. Area CAT scanned prior to excavation. 3. Borehole remained dry on completion. 4. Backfilled with arisings. | WATER LEVEL OBSERVATIONS | | | | | |
| | | Date | Time | Water Strike | Standing Level | Casing Depth |
| | | | | | | |
| | NO WATER ENCOUNTERED: | | | | | |

| | | | |
|--|---|--|---|
| All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum | Page 1 of 1 |
| Plant Used: Dando 2000 | Coordinates / Level (mAOD): E: 524141.44 N: 213021.46 Level: 84.66 | Logged By: WC | Checked By: WC Approved By: SS |

| | | | | | | | | | | | | | |
|--|--|--|--|----------------------------|--|--|--|---|--|--|--|--|--|
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| Project: Broadwater Road, Welwyn Garden City | | | | Project No: 2342.18 | | | | Hole ID: CPT406 | | | | | |
| ROTARY OPEN HOLE BOREHOLE LOG | | | | Date: | | | | Client: Spen Hill Developments Ltd | | | | | |

| Description Of Strata | Legend | Water | Casing Depth / (Diam. mm) Date | Reduced Level / Depth (Thickness) | Flush Return % | Core Recovery | | | | Depth / Core Length | Sample Details | | Test Results | Backfill Details | |
|---|--------|-------|--------------------------------|-----------------------------------|----------------|---------------|-------|-------|------|---------------------|----------------|----------------------|--------------|------------------|--|
| | | | | | | TCR % | SCR % | RCD % | Type | | Ref. | SPT N Value/Drive mm | | | |
| MADE GROUND: Concrete and brick. | | | | 84.98 0.10 | | | | | | | | | | | |
| Soft to firm gravelly CLAY. (LOWESTOFT FORMATION). | | | | (1.70) | | | | | | | | | | | |
| Sandy medium to coarse GRAVEL. (LOWESTOFT FORMATION). | | | | 83.28 1.80 | | | | | | | | | | | |
| Brown slightly gravelly sandy CLAY. (LOWESTOFT FORMATION). | | | | (1.20) | | | | | | | | | | | |
| | | | | 82.08 3.00 | | | | | | | | | | | |
| Brown slightly gravelly sandy CLAY. (LOWESTOFT FORMATION). | | | | (2.10) | | | | | | | | | | | |
| | | | | 79.98 5.10 | | | | | | | | | | | |
| Sandy medium to coarse GRAVEL. (KESGRAVE CATHMENT SUBGROUP). | | | | (1.90) | | | | | | | | | | | |
| | | | | 78.08 7.00 | | | | | | | | | | | |
| Coarse GRAVEL. Occasional cobbles. (KESGRAVE CATHMENT SUBGROUP). | | | | (0.50) | | | | | | | | | | | |
| | | | | 77.58 7.50 | | | | | | | | | | | |
| Soft to firm sandy CLAY. (POSSIBLE KESGRAVE CATHMENT SUBGROUP). | | | | (1.10) | | | | | | | | | | | |
| | | | | 76.48 8.60 | | | | | | | | | | | |
| Borehole complete at 8.60m bgl. | | | | | | | | | | | | | | | |

| | | | | | | |
|---|--------------------------|------|------|--------------|----------------|--------------|
| REMARKS : 1. Engineer verified logged in general accordance to BS 5930:2010. 2. Area CAT scanned prior to excavation. 3. Borehole remained dry on completion. 4. Backfilled with arisings. | WATER LEVEL OBSERVATIONS | | | | | |
| | | Date | Time | Water Strike | Standing Level | Casing Depth |
| | | | | | | |
| | NO WATER ENCOUNTERED: | | | | | |

| | | | |
|--|--|--|-----------------------------------|
| All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum | Page 1 of 1 |
| Plant Used: Dando 2000 | Coordinates / Level (mAOD): E: 524054.08 N: 212913.08 Level: 85.08 | Logged By: WC | Checked By: WC Approved By: SS |

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| | | | | | |
|--------------------------------------|--|-------------|----------------|-----------------------------------|---------------|
| Project: | Broadwater Road, Welwyn Garden City | Project No: | 2342.18 | Hole ID: | CPT407 |
| ROTARY OPEN HOLE BOREHOLE LOG | | | Date: | Client: | |
| | | | | Spen Hill Developments Ltd | |

| Description Of Strata | Legend | Water | Casing Depth / (Diam. mm) Date | Reduced Level / Depth (Thickness) | Flush Return % | Core Recovery | | | | Depth / Core Length | Sample Details | | Test Results | Backfill Details |
|--|--------|-------|--------------------------------|-----------------------------------|----------------|---------------|-------|-------|--|---------------------|----------------|------|----------------------|------------------|
| | | | | | | TCR % | SCR % | RCD % | | | Type | Ref. | SPT N Value/Drive mm | |
| TOPSOIL. | | | | 85.04 0.10 | | | | | | | | | | |
| MADE GROUND: Sandy gravelly clay. | | | | 84.64 0.50 | | | | | | | | | | |
| Orange brown sandy GRAVEL. Occasional bands of clays. Infrequent cobbles. (POSSIBLE LOWEST OFT FORMATION). | | | | (5.00) | | | | | | | | | | |
| | | | | 79.64 5.50 | | | | | | | | | | |
| Borehole complete at 5.50m bgl. | | | | | | | | | | | | | | |

REMARKS :

1. Engineer verified logged in general accordance to BS 5930:2010.
2. Area CAT scanned prior to excavation.
3. Borehole remained dry on completion.
4. Backfilled with arisings.

WATER LEVEL OBSERVATIONS

| Date | Time | Water Strike | Standing Level | Casing Depth |
|------|------|--------------|----------------|--------------|
| | | | | |
| | | | | |

NO WATER ENCOUNTERED:

| | | | | |
|--|--|---|----------------|-----------------|
| All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum | | Page 1 of 1 |
| Plant Used: Dando 2000 | Coordinates / Level (mAOD): E: 524192.11 N: 212866.79 Level: 85.14 | Logged By: WC | Checked By: WC | Approved By: SS |

| | | | | | | | | | | | | | | |
|--|--|--|--|--|----------------------------|--|--|--|--|---|--|--|--|--|
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| Project: Broadwater Road, Welwyn Garden City | | | | | Project No: 2342.18 | | | | | Hole ID: CPT408 | | | | |
| ROTARY OPEN HOLE BOREHOLE LOG | | | | | Date: | | | | | Client: Spen Hill Developments Ltd | | | | |

| Description Of Strata | Legend | Water | Casing Depth / (Diam. mm) Date | Reduced Level / Depth (Thickness) | Flush Return % | Core Recovery | | | | Depth / Core Length | Sample Details | | Test Results SPT N Value/Drive mm | Backfill Details | |
|---|-----------|-------|-----------------------------------|-----------------------------------|----------------|---------------|-------|-------|------|---------------------|----------------|--|--------------------------------------|------------------|--|
| | | | | | | TCR % | SCR % | RCD % | Ref. | | Type | | | | |
| MADE GROUND: Concrete. | [Pattern] | | | 83.58 0.30 | | | | | | | | | | | |
| MADE GROUND: Concrete and brick. | [Pattern] | | | (0.50) 83.08 0.80 | | | | | | | | | | | |
| Orange gravelly CLAY. (LOWESTOFT FORMATION). | [Pattern] | | | (3.60) | | | | | | | | | | | |
| SAND with bands of flint gravel. (KESGRAVE CATHMENT SUBGROUP). | [Pattern] | | | (2.80) | | | | | | | | | | | |
| Soft CLAY. (POSSIBLE KESGRAVE CATHMENT SUBGROUP). | [Pattern] | | | (1.80) | | | | | | | | | | | |
| Borehole complete at 9.00m bgl. | | | | 74.88 9.00 | | | | | | | | | | | |

REMARKS :

- Engineer verified logged in general accordance to BS 5930:2010.
- Area CAT scanned prior to excavation.
- Borehole remained dry on completion.
- Backfilled with arisings.

WATER LEVEL OBSERVATIONS

| Date | Time | Water Strike | Standing Level | Casing Depth |
|-----------------------|------|--------------|----------------|--------------|
| NO WATER ENCOUNTERED: | | | | |

| | | | |
|--|--|--|---|
| All measurements in metres unless otherwise stated | 10m/page Scale: 1:62.50 | Coordinates to National Grid Ground Level to Ordnance Datum | Page 1 of 1 |
| Plant Used: Dando 2000 | Coordinates / Level (mAOD): E: 524110.92 N: 213053.28 Level: 83.88 | Logged By: <div style="text-align: center; font-weight: bold;">WC</div> | Checked By: <div style="text-align: center; font-weight: bold;">WC</div> |
| | | Approved By: <div style="text-align: center; font-weight: bold;">SS</div> | |

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| | | |
|--|-------------------------------|--|
| Project: Broadwater Road, Welwyn Garden City | Project No: 2342.18 | Hole ID: CPT408B |
| | Date: | Client: Spen Hill Developments Ltd |

| Description Of Strata | Legend | Water | Casing Depth / (Diam. mm) Date | Depth (Thickness) | Flush Return % | Core Recovery | | | | Depth / Core Length | Sample Details | | Test Results | |
|-----------------------|--------|-------|---|----------------------|-------------------|------------------|----------|----------|----------|------------------------|-------------------|------|--------------|--|
| | | | | | | TCR % | SCR % | RCD % | RCD % | | Type | Ref. | | |
| | | | | 1.00 | | | | | | | | | | |
| | | | | (7.00) | | | | | | | | | | |
| | | | | 8.00 | | | | | | | | | | |
| | | | | (3.50) | | | | | | | | | | |
| | | | | 11.50 | | | | | | | | | | |
| | | | | 12.10 | | | | | | | | | | |
| | | | | (1.80) | | | | | | | | | | |
| | | | | 13.90 | | | | | | | | | | |
| | | | | (3.30) | | | | | | | | | | |
| | | | | 17.20 | | | | | | | | | | |
| | | | | (1.30) | | | | | | | | | | |
| | | | | 18.50 | | | | | | | | | | |
| | | | | (1.70) | | | | | | | | | | |
| | | | | 20.20 | | | | | | | | | | |

REMARKS :

WATER LEVEL OBSERVATIONS

| Date | Time | Water Strike | Standing Level | Casing Depth |
|------|------|-----------------|-------------------|-----------------|
|------|------|-----------------|-------------------|-----------------|

NO WATER ENCOUNTERED:

All measurements in metres
unless otherwise stated

10m/page Scale: 1:152.63

Coordinates to Local Grid
Ground Level to Local Datum

Page 1 of 1

| | | | | |
|-------------|--|-------------------------|--------------------------|---------------------------|
| Plant Used: | Coordinates / Level (mAOD): E: 524051.85 N: 212879.17 Level: 85.19 | Logged By: WC | Checked By: WC | Approved By: SS |
|-------------|--|-------------------------|--------------------------|---------------------------|





LABORATORY REPORT



4043

Contract Number: PSL14/5609

Client's Reference:

Report Date: 21 November 2014

Client Name: Delta Simons Environmental Consultant
3 Henley Office Park
Doddington Road
Lincoln

LN6 3QR

For the attention of: Will Capps

Contract Title: Welwyn Garden City

Date Received: 30/10/2014

Date Commenced: 30/10/2014

Date Completed: 14/11/2014

Notes: Observations and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson
(Director)

A Watkins
(Director)


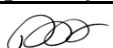


M Beastall
(Laboratory Manager)

D Lambe
(Senior Technician)

S Royle
(Senior Technician)





SUMMARY OF LABORATORY SOIL DESCRIPTIONS

| Hole Number | Sample Number | Sample Type | Depth m | Description of Sample |
|-------------|---------------|-------------|-------------|--|
| BH401 | 3 | D | 2.50-3.00 | Brown very gravelly very sandy CLAY. |
| BH401 | 2 | B | 6.00-6.50 | Brown very sandy GRAVEL. |
| BH402 | 2 | B | 5.00-5.50 | Brown gravelly sandy CLAY. |
| BH402 | 10 | D | 13.50-13.95 | Pale brown CLAY with chalk |
| BH403 | 4 | D | 3.50-3.95 | Brown very gravelly very sandy CLAY. |
| BH403 | 4 | B | 16.50-16.95 | White CHALK. |
| BH404 | 1 | U | 2.50-2.95 | Firm brown very sandy CLAY. |
| BH404 | 5 | D | 5.00 | Brown slightly gravelly sandy CLAY. |
| BH404 | 3 | B | 8.40 | Brown sandy slightly silty GRAVEL. |
| BH405 | 5 | D | 4.50-4.95 | Brown very gravelly very sandy CLAY. |
| BH406 | 1 | B | 2.50-2.95 | Brown very gravelly very sandy CLAY. |
| BH406 | 1 | U | 7.50-7.95 | Soft brown very sandy CLAY. |
| BH406 | 2 | B | 9.00-9.45 | Brown very sandy slightly silty GRAVEL. |
| BH406 | 18 | D | 24.00-24.45 | White CHALK. |
| BH407 | 1 | U | 6.00-6.45 | Firm brown gravelly very sandy CLAY. |
| BH407 | 9 | D | 7.50-7.95 | Brown very gravelly very sandy CLAY. |
| BH408 | 2 | B | 2.50-3.00 | Brown very gravelly very sandy CLAY. |
| BH408 | 3 | B | 14.90 | Brown gravelly very sandy silty CLAY with chalk. |
| BH409 | 3 | D | 1.50-2.00 | Brown very gravelly slightly sandy CLAY. |

| | | | | | | |
|---|--|----------|---|----------|---|------------|
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| | WELWYN GARDEN CITY. | | | | Contract No: | PSL14/5609 |
| | | | | | Client Ref: | WGC2342-18 |

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

| Hole Number | Sample Number | Sample Type | Depth m | Description of Sample |
|-------------|---------------|-------------|-------------|--|
| BH410 | 5 | D | 3.50-4.00 | Brown very gravelly very sandy CLAY. |
| BH411 | 8 | D | 9.00-9.50 | Brown slightly gravelly sandy CLAY. |
| BH411 | 3 | B | 11.50 | White CHALK with flint. |
| BH412 | 1 | B | 2.50-2.95 | Brown very gravelly very sandy CLAY. |
| BH413 | 2 | D | 1.00 | Brown slightly gravelly slightly sandy CLAY. |
| BH413 | 1 | U | 1.50-1.95 | Firm brown very sandy CLAY. |
| BH413 | 4 | B | 10.50-10.95 | Dark brown sandy very clayey GRAVEL. |
| BH413 | 5 | B | 16.50-16.95 | White CHALK. |
| BH414 | 1 | U | 2.50-2.95 | Brown slightly gravelly sandy CLAY. |
| BH415 | 2 | B | 4.50-4.95 | Brown slightly gravelly sandy CLAY. |
| BH415 | 3 | B | 6.00-6.45 | Brown very gravelly slightly silty SAND. |
| BH416 | 1 | U | 1.50-1.95 | Brown very gravelly sandy CLAY. |
| BH416 | 2 | U | 3.50-3.95 | Firm brown very sandy CLAY. |
| BH416 | 6 | D | 4.50-4.95 | Brown slightly gravelly SAND. |
| | | | | |
| | | | | |
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|---|---|----------|---|----------|---|------------|
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| | | | | | Client Ref: | WGC2342-18 |

SUMMARY OF SOIL CLASSIFICATION TESTS

(B.S. 1377 : PART 2 : 1990)

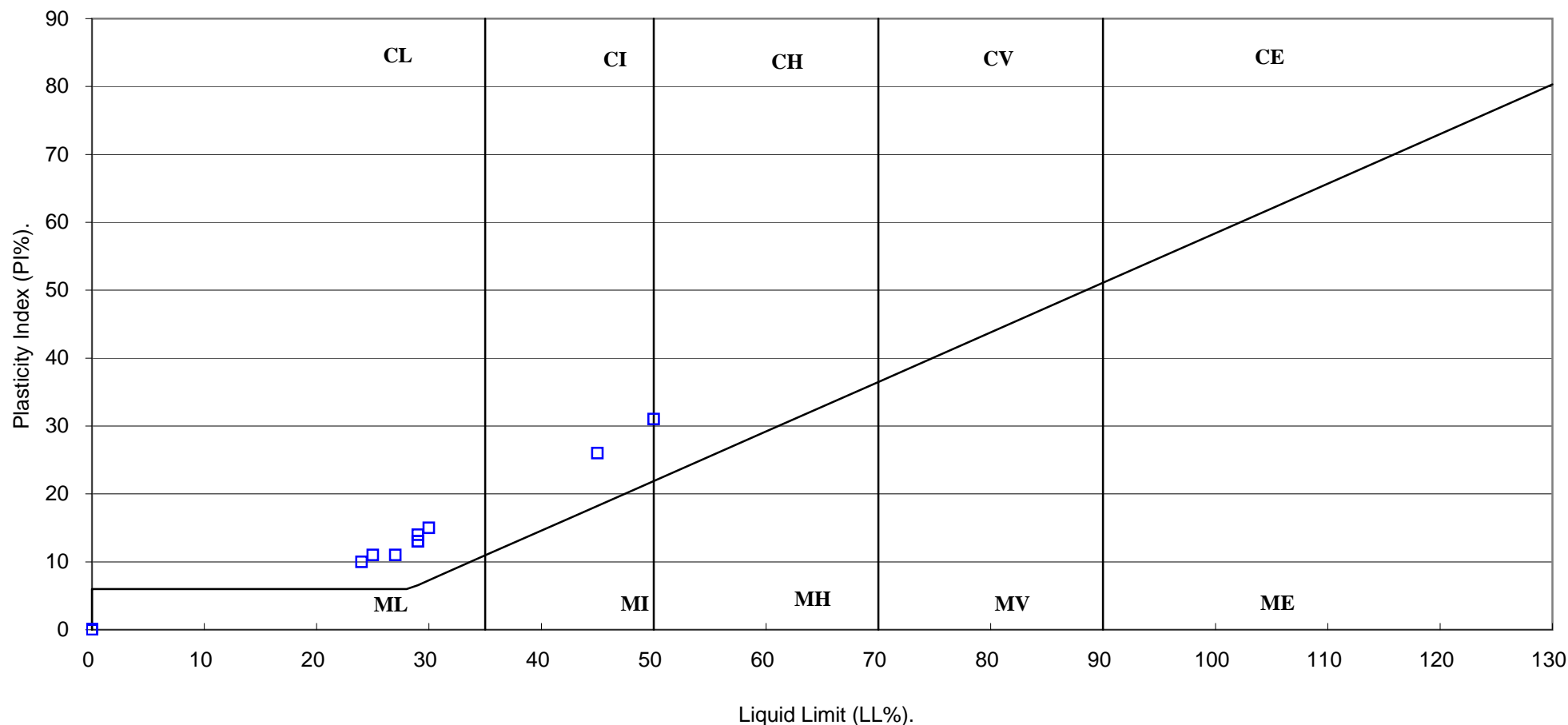
| Hole Number | Sample Number | Sample Type | Depth m | Moisture Content % Clause 3.2 | Bulk Density Mg/m ³ Clause 7.2 | Dry Density Mg/m ³ Clause 7.2 | Particle Density Mg/m ³ Clause 8.2 | Liquid Limit % Clause 4.3/4.4 | Plastic Limit % Clause 5.3 | Plasticity Index % Clause 5.4 | % Passing .425mm | Remarks |
|-------------|---------------|-------------|-------------|----------------------------------|--|---|--|----------------------------------|-------------------------------|----------------------------------|------------------|-----------------------------|
| BH401 | 3 | D | 2.50-3.00 | 19 | | | | 30 | 15 | 15 | 70 | Low plasticity CL. |
| BH402 | 2 | B | 5.00-5.50 | 25 | | | | 45 | 19 | 26 | 89 | Intermediate plasticity CI. |
| BH402 | 10 | D | 13.50-13.95 | 34 | | | | | | | | |
| BH403 | 4 | D | 3.50-3.95 | 11 | | | | 24 | 14 | 10 | 64 | Low plasticity CL. |
| BH404 | 5 | D | 5.00 | 22 | | | | | | | | |
| BH405 | 5 | D | 4.50-4.95 | 11 | | | | 25 | 14 | 11 | 66 | Low plasticity CL. |
| BH406 | 1 | B | 2.50-2.95 | 13 | | | | | | | | |
| BH406 | 18 | D | 24.00-24.45 | 27 | | | | | | | | |
| BH407 | 9 | D | 7.50-7.95 | 16 | | | | 27 | 16 | 11 | 64 | Low plasticity CL. |
| BH408 | 2 | B | 2.50-3.00 | 18 | | | | 29 | 15 | 14 | 62 | Low plasticity CL. |
| BH409 | 3 | D | 1.50-2.00 | 20 | | | | | | | | |
| BH410 | 5 | D | 3.50-4.00 | 15 | | | | 29 | 16 | 13 | 62 | Low plasticity CL. |
| BH411 | 8 | D | 9.00-9.50 | 15 | | | | | | | | |
| BH412 | 1 | B | 2.50-2.95 | 17 | | | | 29 | 16 | 13 | 71 | Low plasticity CL. |
| BH413 | 2 | D | 1.00 | 19 | | | | | | | | |
| BH413 | 5 | B | 16.50-16.95 | 32 | | | | | | | | |
| BH414 | 1 | U | 2.50-2.95 | 17 | | | | | | | | |
| BH415 | 2 | B | 4.50-4.95 | 19 | | | | 50 | 19 | 31 | 85 | Intermediate plasticity CI. |
| BH416 | 1 | U | 1.50-1.95 | 12 | | | | | | | | |

SYMBOLS : NP : Non Plastic

| | | | | | | |
|---|--|----------|---|----------|---|-------------------------|
|  Professional Soils Laboratory | Compiled by | Date | Checked by | Date | Approved by | Date |
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| | WELWYN GARDEN CITY. | | | | | Contract No: PSL14/5609 |
| | | | | | | Client Ref: WGC2342-18 |

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(B.S.5930 : 1999)



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Date

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Date

14/11/14

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Date

14/11/14

WELWYN GARDEN CITY.

Contract No:

PSL14/5609

Client Ref:

WGC2342-18

SUMMARY OF SOIL CLASSIFICATION TESTS




(B.S. 1377 : PART 2 : 1990)

[illegible]

SYMBOLS : NP : Non Plastic



Professional Soils Laboratory

| | | | | | |
|--|----------|---|----------|---|------------|
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| | | | | Client Ref: | WGC2342-18 |





SUMMARY OF SOIL CLASSIFICATION TESTS

(B.S. 1377 : PART 2 : 1990)

[illegible]

SYMBOLS : NP : Non Plastic

* : Liquid Limit and Plastic Limit Wet Sieved.

| | | | | | | |
|---|---|----------|---|-------------|---|----------|
|  Professional Soils Laboratory | Compiled by | Date | Checked by | Date | Approved by | Date |
| |  | 21/11/14 |  | 11/21/14 |  | 11/21/14 |
| | WELWYN GARDEN CITY. | | | | Contract No: PSL14/5609 | |
| | | | | Client Ref: | | |

Particle Size Distribution Test

BS1377 : Part 2 : 1990

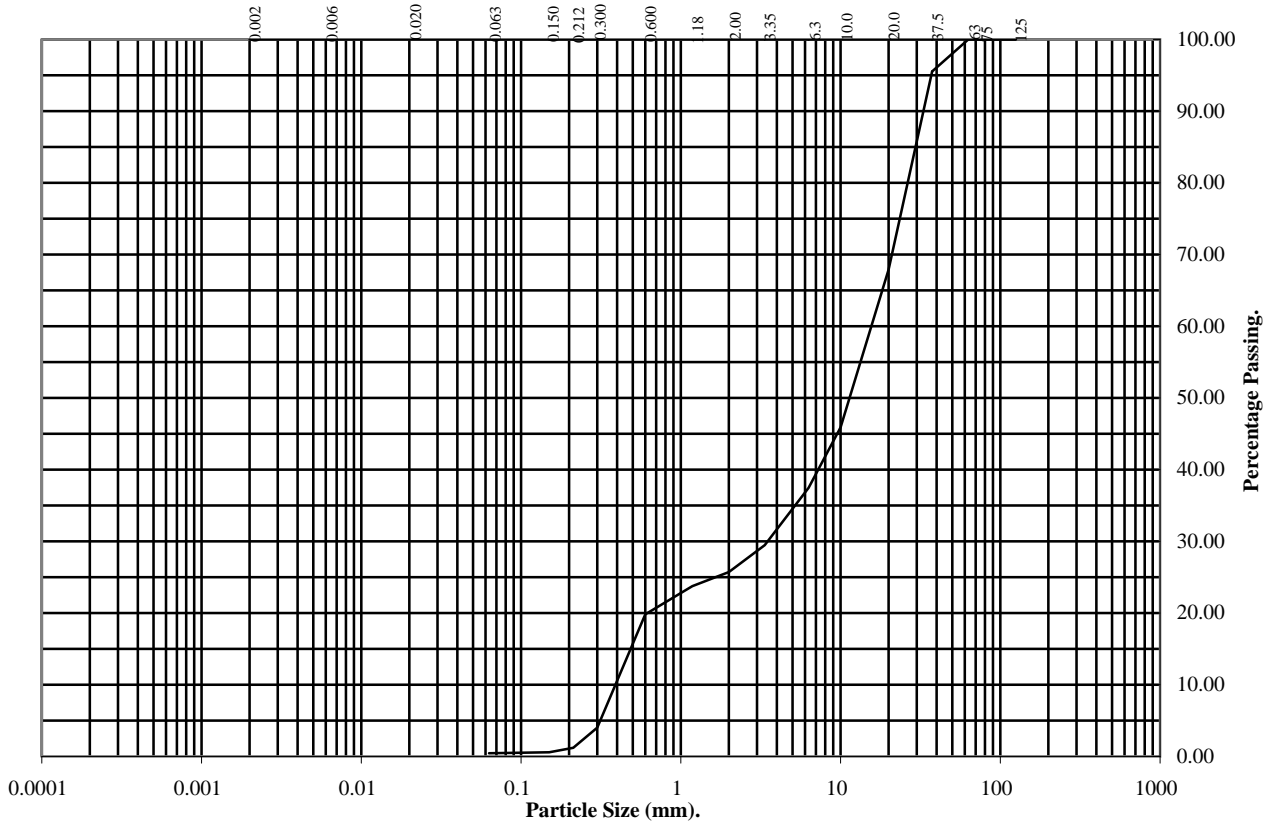
Wet Sieve, Clause 9.2

Hole Number: BH401

Depth (m): 6.00-6.50

Sample Number: 2

Sample Type: B



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125 | 100 |
| 75 | 100 |
| 63 | 100 |
| 37.5 | 96 |
| 20 | 68 |
| 10 | 46 |
| 6.3 | 37 |
| 3.35 | 29 |
| 2 | 26 |
| 1.18 | 24 |
| 0.6 | 20 |
| 0.3 | 4 |
| 0.212 | 1 |
| 0.15 | 1 |
| 0.063 | 0 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles | 0 |
| Gravel | 74 |
| Sand | 26 |
| Silt / Clay | 0 |

Remarks:
See summary of soil descriptions.

| Checked By | Date | Approved By | Date |
|--------------------|----------|--------------------|----------|
| <i>[Signature]</i> | 14/11/14 | <i>[Signature]</i> | 14/11/14 |

Particle Size Distribution Test

BS1377 : Part 2 : 1990

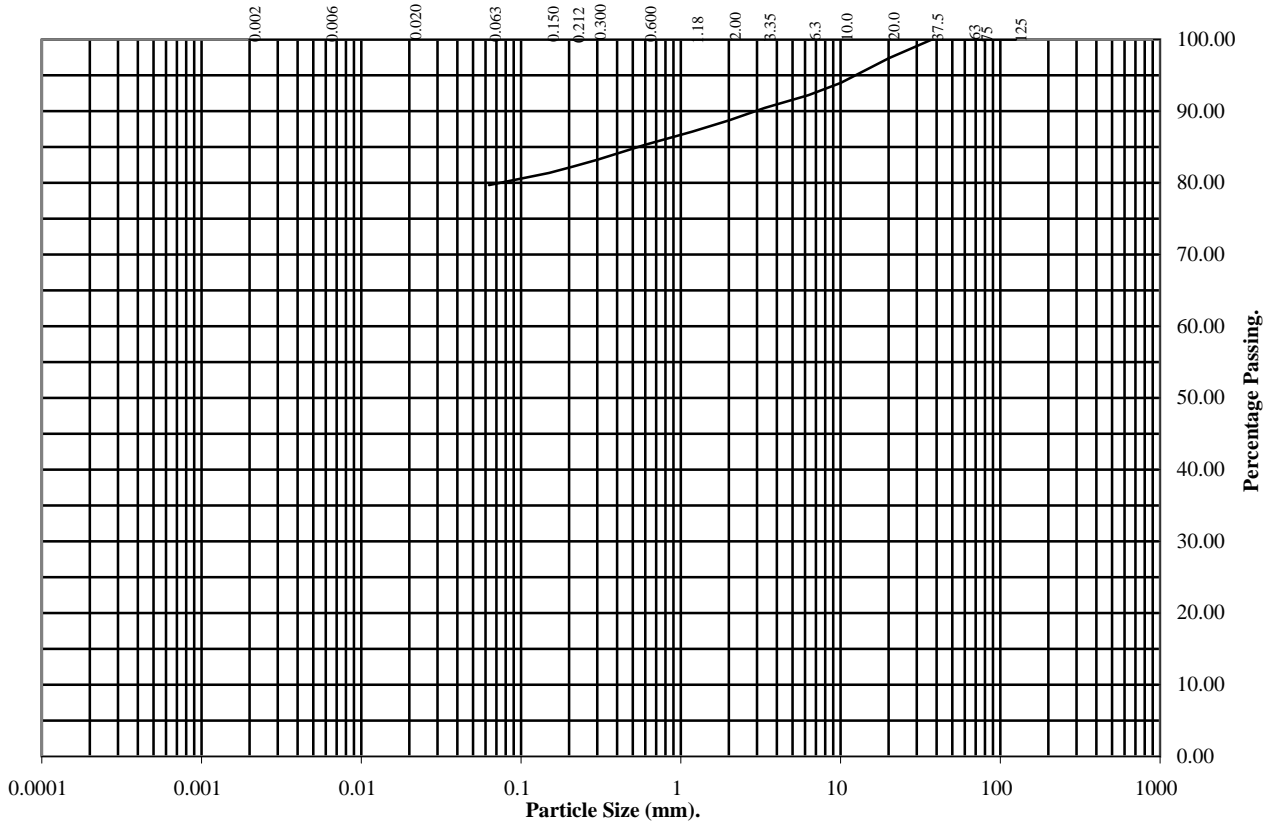
Wet Sieve, Clause 9.2

Hole Number: BH403

Depth (m): 16.50-16.95

Sample Number: 4

Sample Type: B



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125 | 100 |
| 75 | 100 |
| 63 | 100 |
| 37.5 | 100 |
| 20 | 97 |
| 10 | 94 |
| 6.3 | 92 |
| 3.35 | 90 |
| 2 | 89 |
| 1.18 | 87 |
| 0.6 | 85 |
| 0.3 | 83 |
| 0.212 | 82 |
| 0.15 | 81 |
| 0.063 | 80 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles | 0 |
| Gravel | 11 |
| Sand | 9 |
| Silt / Clay | 80 |

Remarks:

See summary of soil descriptions.

| Checked By | Date | Approved By | Date |
|--------------------|----------|--------------------|----------|
| <i>[Signature]</i> | 14/11/14 | <i>[Signature]</i> | 14/11/14 |

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WELWYN GARDEN CITY.

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Particle Size Distribution Test

BS1377 : Part 2 : 1990

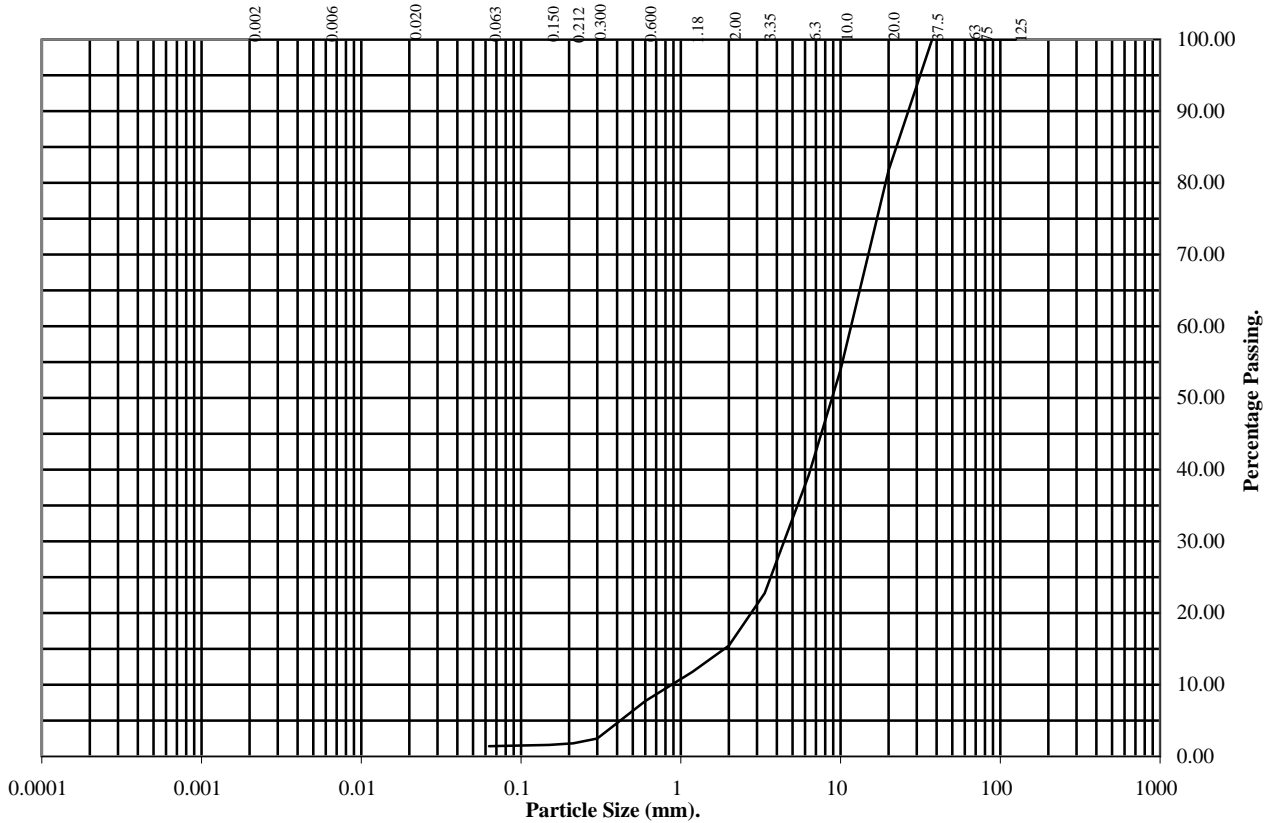
Wet Sieve, Clause 9.2

Hole Number: BH404

Depth (m): 8.40

Sample Number: 3

Sample Type: B



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125 | 100 |
| 75 | 100 |
| 63 | 100 |
| 37.5 | 100 |
| 20 | 82 |
| 10 | 54 |
| 6.3 | 39 |
| 3.35 | 23 |
| 2 | 15 |
| 1.18 | 12 |
| 0.6 | 8 |
| 0.3 | 3 |
| 0.212 | 2 |
| 0.15 | 2 |
| 0.063 | 1 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles | 0 |
| Gravel | 85 |
| Sand | 14 |
| Silt / Clay | 1 |

Remarks:
See summary of soil descriptions.

| Checked By | Date | Approved By | Date |
|--------------------|----------|--------------------|----------|
| <i>[Signature]</i> | 14/11/14 | <i>[Signature]</i> | 14/11/14 |

Particle Size Distribution Test

BS1377 : Part 2 : 1990

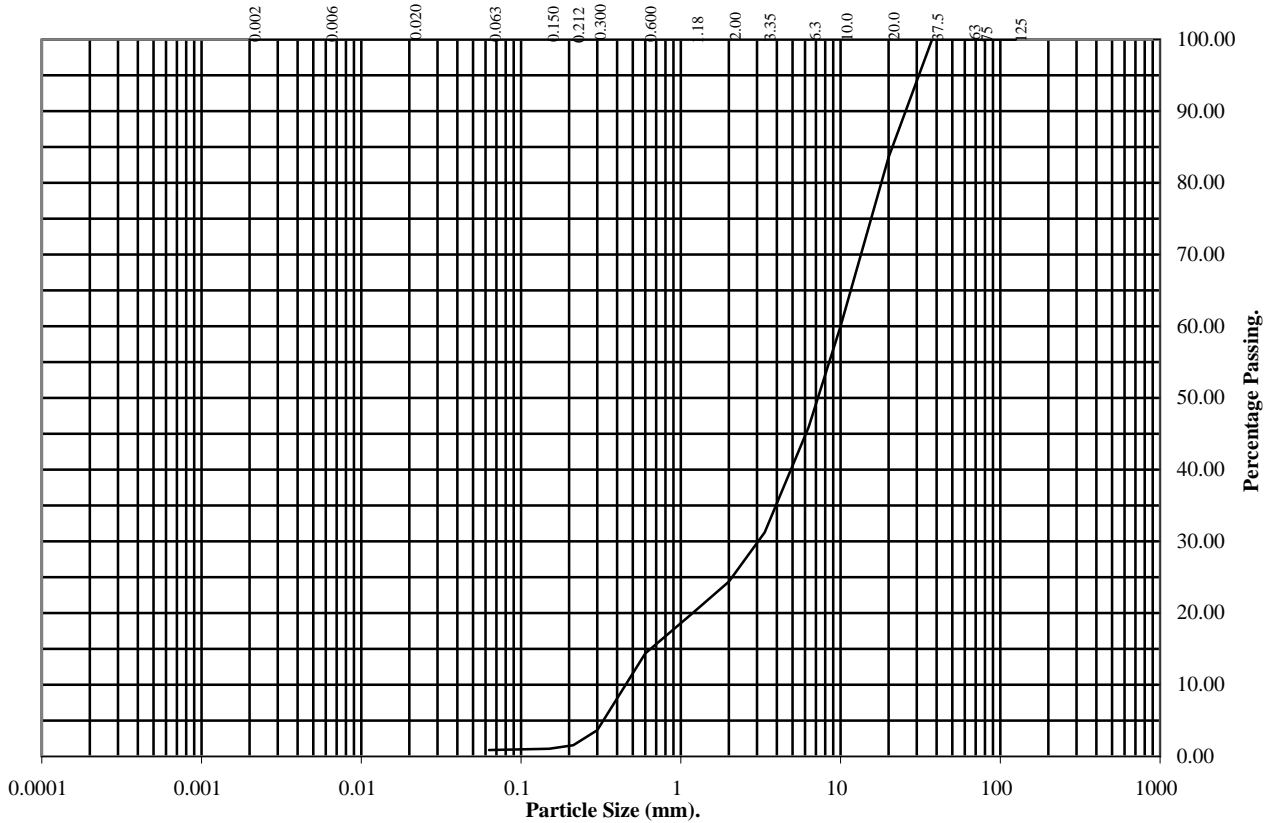
Wet Sieve, Clause 9.2

Hole Number: BH406

Depth (m): 9.00-9.45

Sample Number: 2

Sample Type: B



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125 | 100 |
| 75 | 100 |
| 63 | 100 |
| 37.5 | 100 |
| 20 | 84 |
| 10 | 60 |
| 6.3 | 46 |
| 3.35 | 31 |
| 2 | 24 |
| 1.18 | 20 |
| 0.6 | 14 |
| 0.3 | 4 |
| 0.212 | 2 |
| 0.15 | 1 |
| 0.063 | 1 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles | 0 |
| Gravel | 76 |
| Sand | 23 |
| Silt / Clay | 1 |

Remarks:
See summary of soil descriptions.

| Checked By | Date | Approved By | Date |
|--------------------|----------|--------------------|----------|
| <i>[Signature]</i> | 14/11/14 | <i>[Signature]</i> | 14/11/14 |

Particle Size Distribution Test

BS1377 : Part 2 : 1990

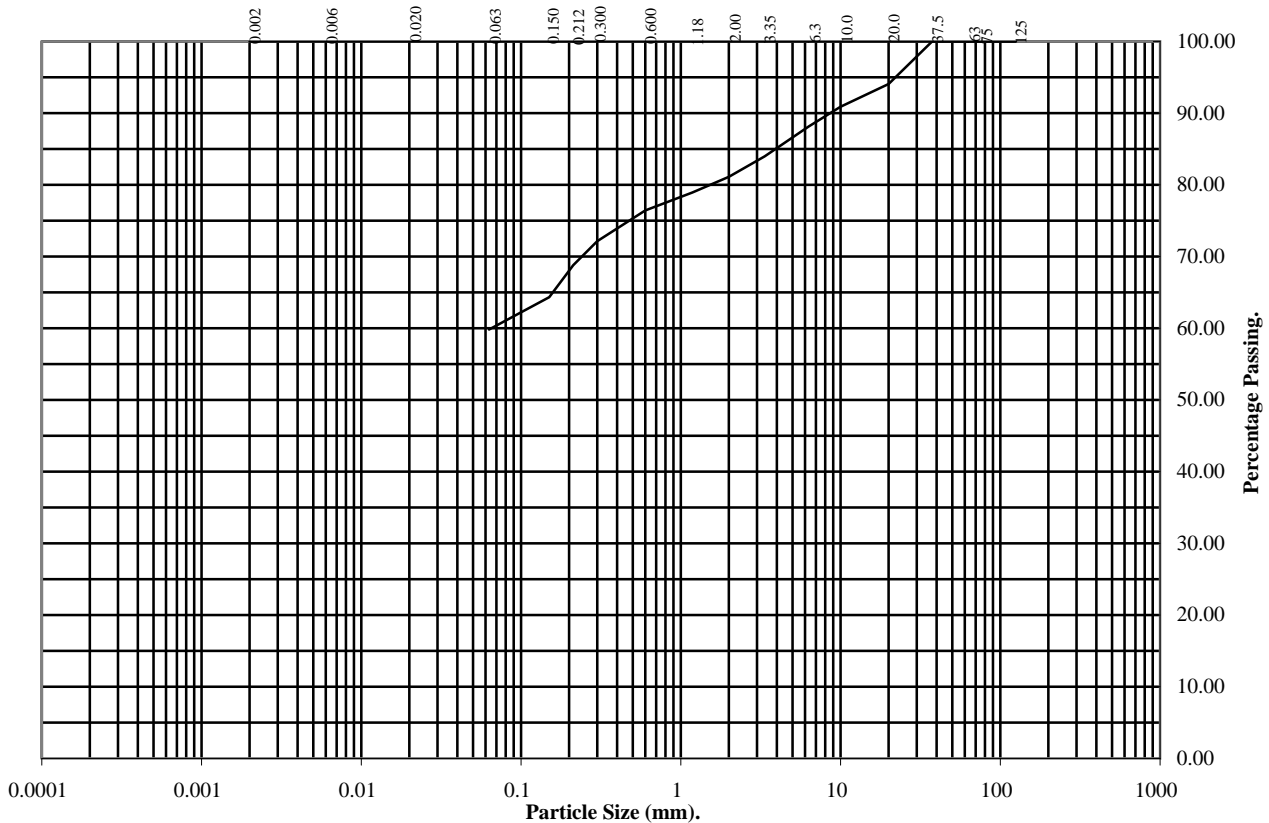
Wet Sieve, Clause 9.2

Hole Number: BH408

Depth (m): 14.90

Sample Number: 3

Sample Type: B



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125 | 100 |
| 75 | 100 |
| 63 | 100 |
| 37.5 | 100 |
| 20 | 94 |
| 10 | 91 |
| 6.3 | 88 |
| 3.35 | 84 |
| 2 | 81 |
| 1.18 | 79 |
| 0.6 | 76 |
| 0.3 | 72 |
| 0.212 | 69 |
| 0.15 | 64 |
| 0.063 | 60 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles | 0 |
| Gravel | 19 |
| Sand | 21 |
| Silt / Clay | 60 |

Remarks:

See summary of soil descriptions.

| Checked By | Date | Approved By | Date |
|--------------------|----------|--------------------|----------|
| <i>[Signature]</i> | 14/11/14 | <i>[Signature]</i> | 14/11/14 |

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Particle Size Distribution Test

BS1377 : Part 2 : 1990

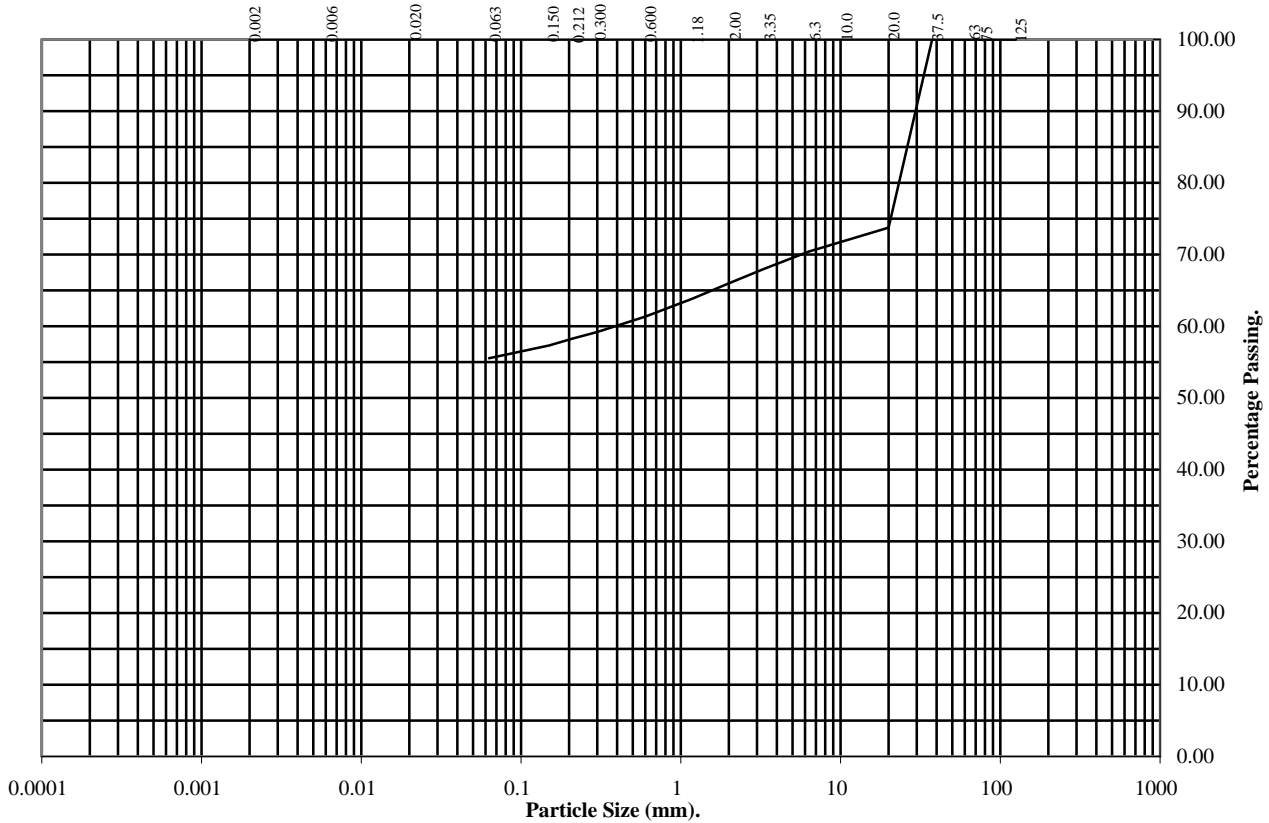
Wet Sieve, Clause 9.2

Hole Number: BH411

Depth (m): 11.50

Sample Number: 3

Sample Type: B



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125 | 100 |
| 75 | 100 |
| 63 | 100 |
| 37.5 | 100 |
| 20 | 74 |
| 10 | 72 |
| 6.3 | 70 |
| 3.35 | 68 |
| 2 | 66 |
| 1.18 | 64 |
| 0.6 | 61 |
| 0.3 | 59 |
| 0.212 | 58 |
| 0.15 | 57 |
| 0.063 | 56 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles | 0 |
| Gravel | 34 |
| Sand | 10 |
| Silt / Clay | 56 |

Remarks:

See summary of soil descriptions.

| Checked By | Date | Approved By | Date |
|--------------------|----------|--------------------|----------|
| <i>[Signature]</i> | 14/11/14 | <i>[Signature]</i> | 14/11/14 |

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Contract No.:
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Particle Size Distribution Test

BS1377 : Part 2 : 1990

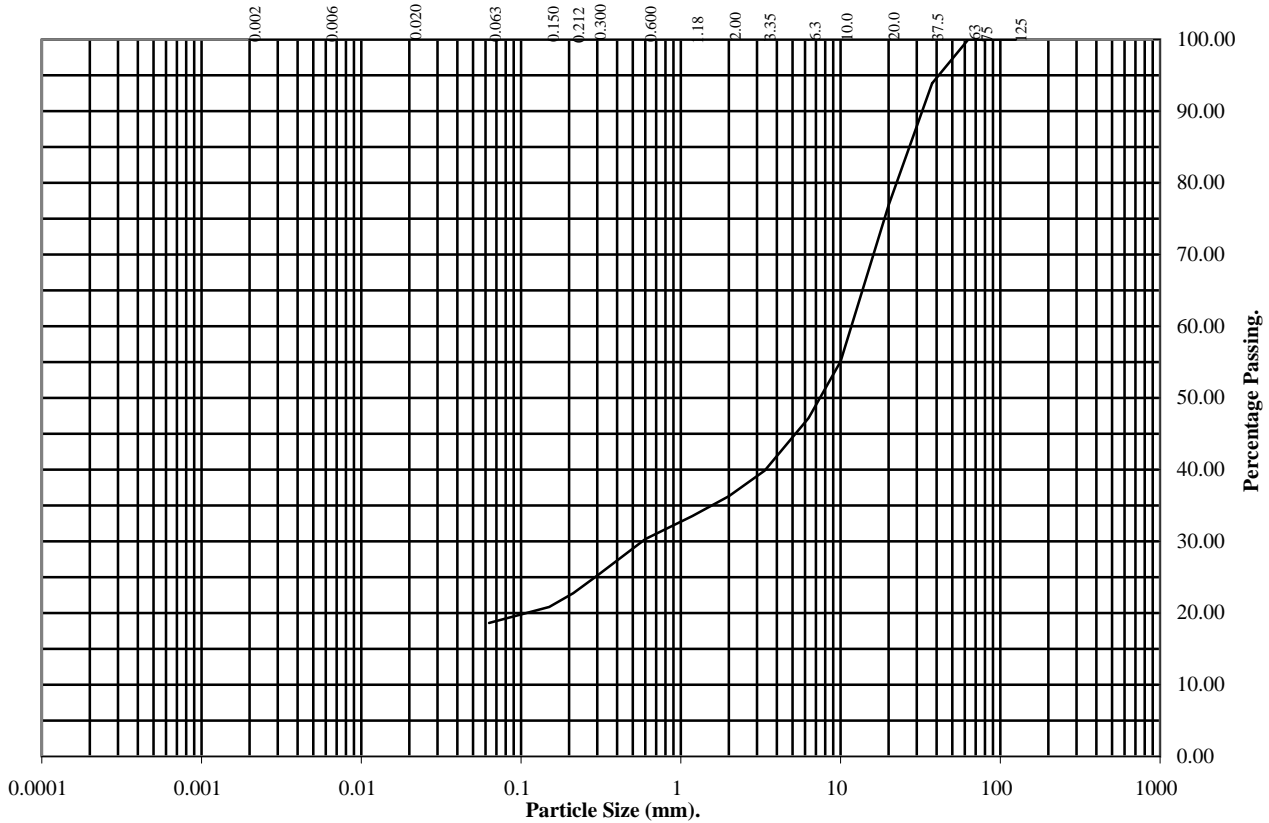
Wet Sieve, Clause 9.2

Hole Number: BH413

Depth (m): 10.50-10.95

Sample Number: 4

Sample Type: B



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125 | 100 |
| 75 | 100 |
| 63 | 100 |
| 37.5 | 94 |
| 20 | 77 |
| 10 | 55 |
| 6.3 | 47 |
| 3.35 | 40 |
| 2 | 36 |
| 1.18 | 34 |
| 0.6 | 30 |
| 0.3 | 25 |
| 0.212 | 23 |
| 0.15 | 21 |
| 0.063 | 19 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles | 0 |
| Gravel | 64 |
| Sand | 17 |
| Silt / Clay | 19 |

Remarks:
See summary of soil descriptions.

| Checked By | Date | Approved By | Date |
|--------------------|----------|--------------------|----------|
| <i>[Signature]</i> | 14/11/14 | <i>[Signature]</i> | 14/11/14 |

Particle Size Distribution Test

BS1377 : Part 2 : 1990

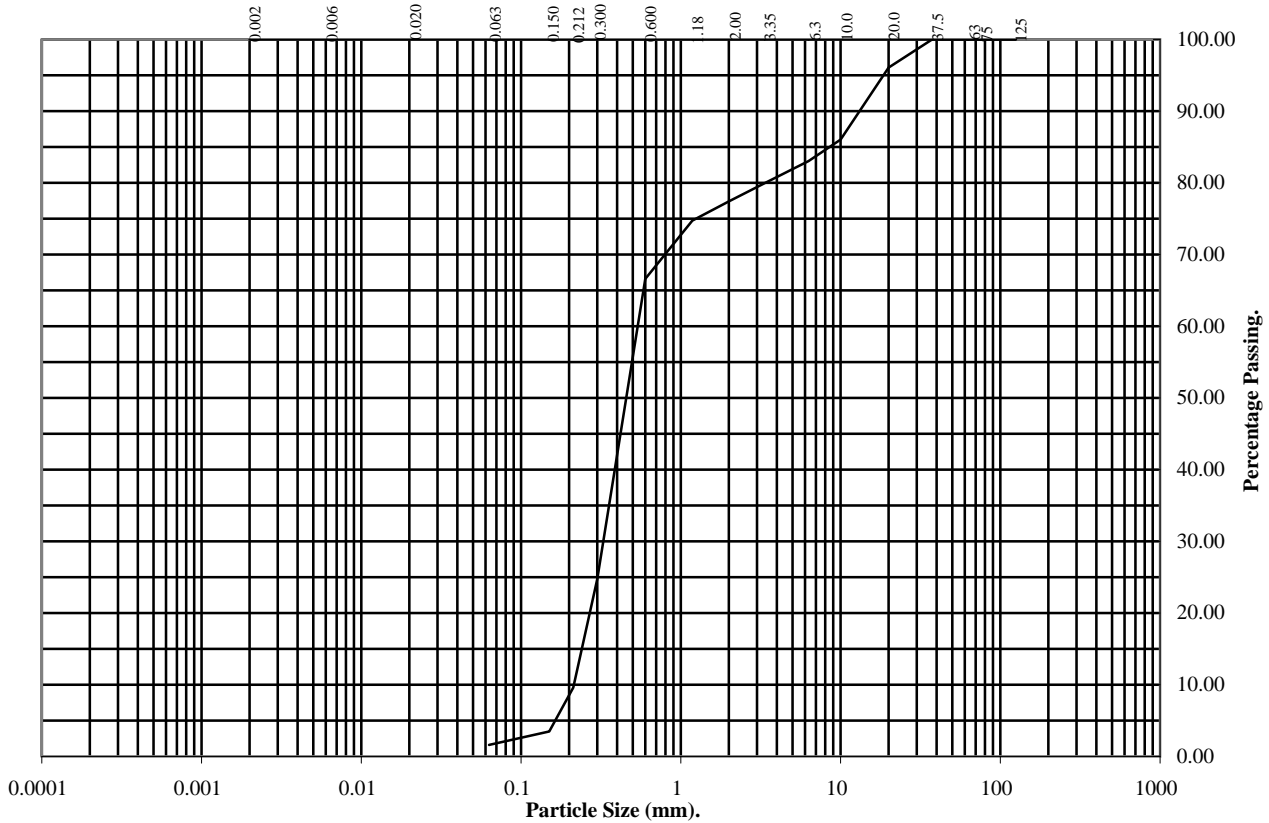
Wet Sieve, Clause 9.2

Hole Number: BH415

Depth (m): 6.00-6.45

Sample Number: 3

Sample Type: B



| BS Test Sieve | Percentage Passing |
|---------------|--------------------|
| 125 | 100 |
| 75 | 100 |
| 63 | 100 |
| 37.5 | 100 |
| 20 | 96 |
| 10 | 86 |
| 6.3 | 83 |
| 3.35 | 80 |
| 2 | 77 |
| 1.18 | 75 |
| 0.6 | 67 |
| 0.3 | 25 |
| 0.212 | 10 |
| 0.15 | 3 |
| 0.063 | 2 |

| Soil Fraction | Total Percentage |
|---------------|------------------|
| Cobbles | 0 |
| Gravel | 23 |
| Sand | 75 |
| Silt / Clay | 2 |

Remarks:

See summary of soil descriptions.

| Checked By | Date | Approved By | Date |
|--------------------|----------|--------------------|----------|
| <i>[Signature]</i> | 14/11/14 | <i>[Signature]</i> | 14/11/14 |

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WELWYN GARDEN CITY.

Contract No.:
PSL14/5609

Undrained Shear Strength in Triaxial Compression

without measurement of Pore Pressure

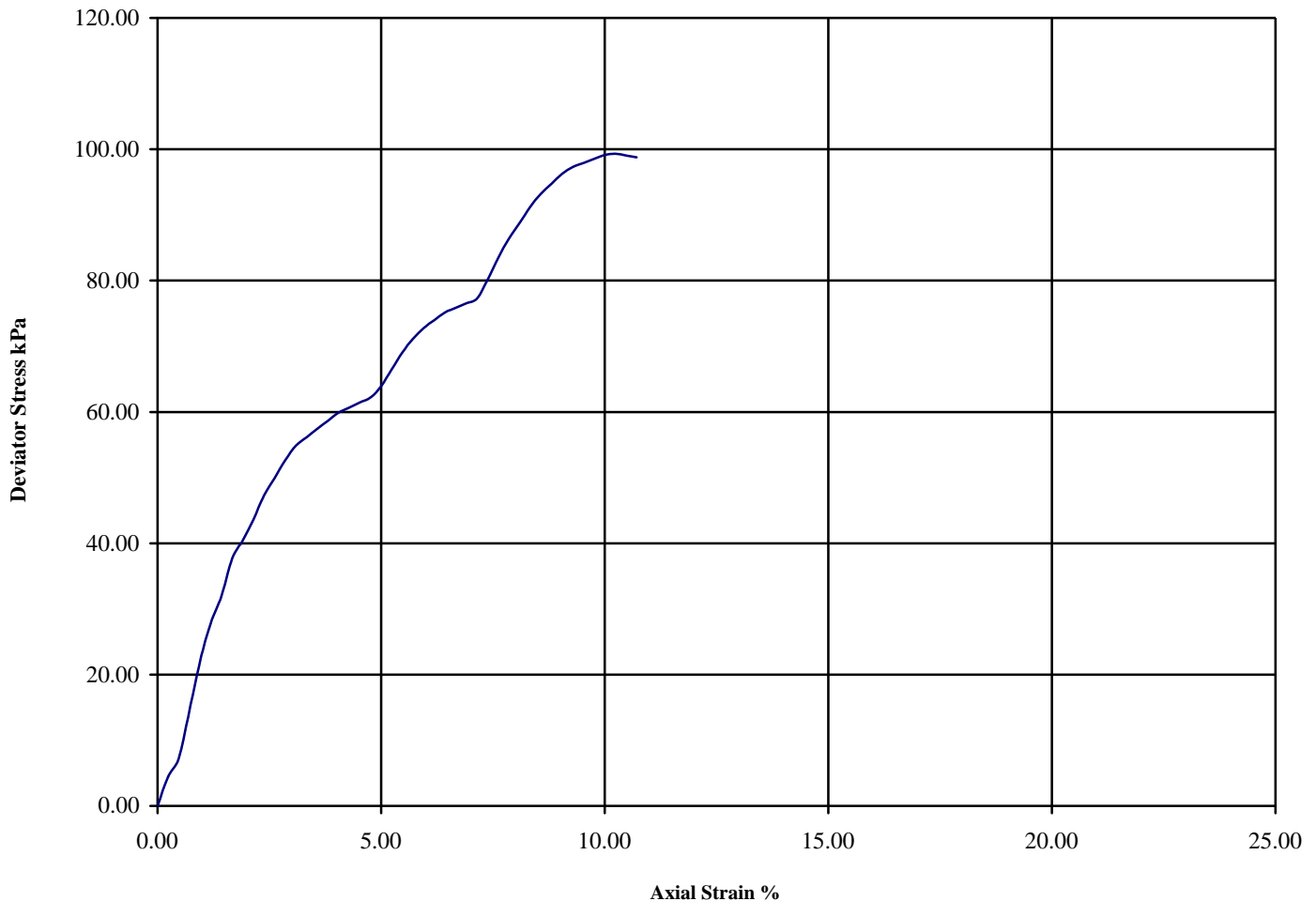
B.S. 1377 : Part 7 : Clause 9 : 1990



Hole Number: BH404

Depth (m): 2.50-2.95

Sample Number: 1

Sample Type: U



| Diameter (mm): | | 102 | Height (mm): | | 210 | Test: | 100mm Multistage | | | | | | |
|----------------|----------|---------|--------------|------------|--|---|------------------|----------|---|----------|---|----------|--|
| Specimen | Moisture | Bulk | Dry | Cell | Corr. Max. | Shear | Failure | Mode | Remarks | | | | |
| | Content | Density | Density | Pressure | Deviator | Strength | Strain | of | Sample taken from top of tube Rate of strain = 1.9 %/min Latex Membrane used 0.2 mm thickness Membrane Correction applied (kPa) 0.36 0.36 0.35 See summary of soil descriptions. | | | | |
| | (%) | (Mg/m3) | (Mg/m3) | (kPa) | Stress | Cu | (%) | Failure | | | | | |
| | | | | θ_3 | ($\theta_1 - \theta_3$) _f | $\frac{1}{2}(\theta_1 - \theta_3)$ _f | | | | | | | |
| | | | | | | | | | | | | | |
| A | 20 | 2.03 | 1.69 | 50 | 62 | 31 | 4.8 | Compound | | | | | |
| | | | | 100 | 77 | 39 | 7.1 | | | | | | |
| | | | | 150 | 99 | 50 | 10.2 | | Checked | Date | Approved | Date | |
| | | | | | | | | |  | 14/11/14 |  | 14/11/14 | |



WELWYN GARDEN CITY.

Contract No:
PSL14/5609

Undrained Shear Strength in Triaxial Compression

without measurement of Pore Pressure

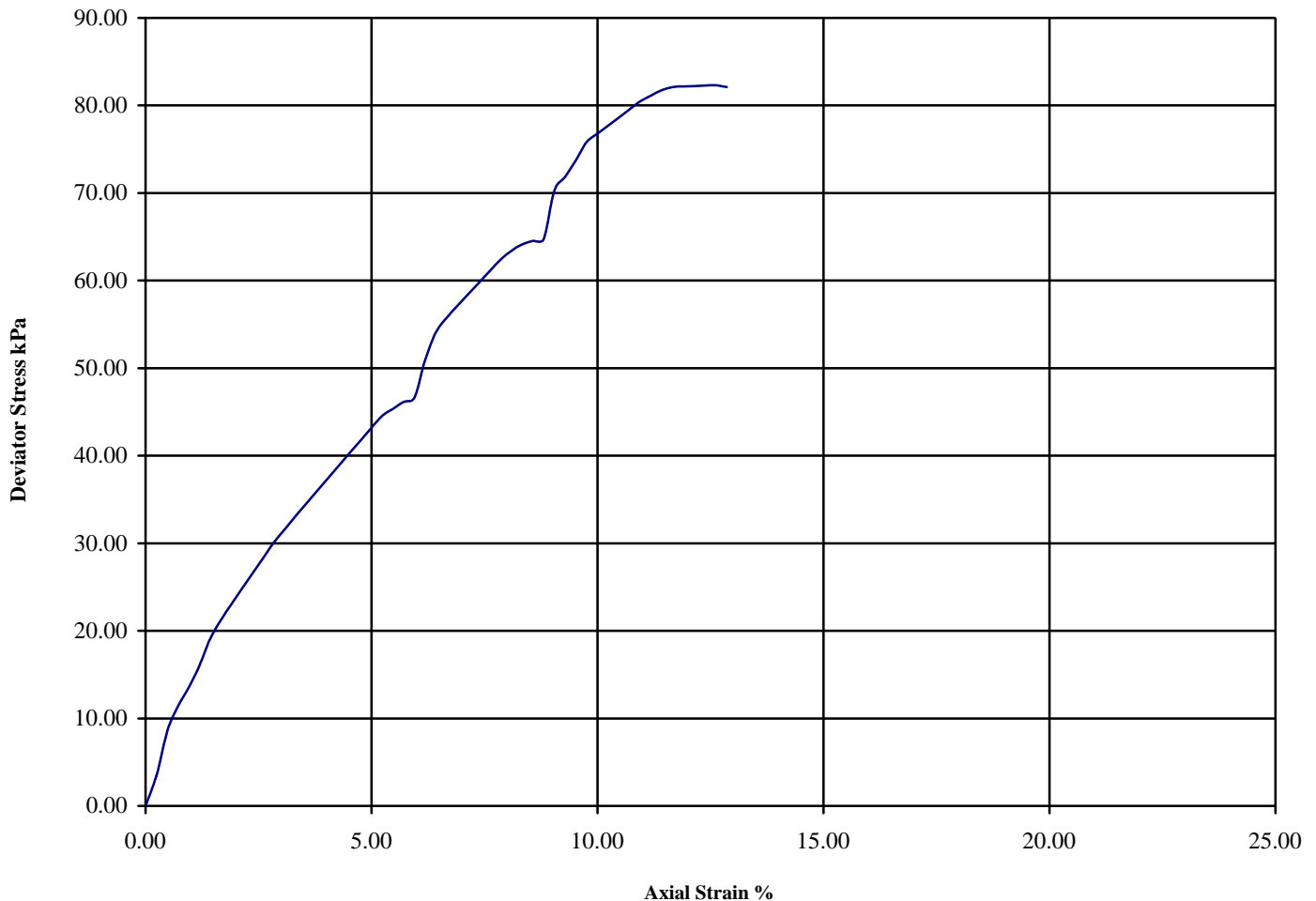
B.S. 1377 : Part 7 : Clause 9 : 1990



Hole Number: BH406

Depth (m): 7.50-7.95

Sample Number: 1

Sample Type: U



| Diameter (mm): | | 102 | Height (mm): | | 210 | Test: | 100mm Multistage | | | | | | |
|----------------|----------|---------|--------------|------------|--|---|------------------|----------|---|----------|---|----------|--|
| Specimen | Moisture | Bulk | Dry | Cell | Corr. Max. | Shear | Failure | Mode | Remarks | | | | |
| | Content | Density | Density | Pressure | Deviator | Strength | Strain | of | Sample taken from top of tube Rate of strain = 1.9 %/min Latex Membrane used 0.2 mm thickness Membrane Correction applied (kPa) 0.36 0.36 0.35 See summary of soil descriptions. | | | | |
| | (%) | (Mg/m3) | (Mg/m3) | (kPa) | Stress | Cu | (%) | Failure | | | | | |
| | | | | θ_3 | ($\theta_1 - \theta_3$) _f | $\frac{1}{2}(\theta_1 - \theta_3)$ _f | | | | | | | |
| | | | | | | | | | | | | | |
| A | 21 | 2.20 | 1.82 | 150 | 47 | 23 | 6.0 | Compound | | | | | |
| | | | | 300 | 65 | 32 | 8.6 | | | | | | |
| | | | | 450 | 82 | 41 | 12.6 | | | | | | |
| | | | | | | | | | Checked | Date | Approved | Date | |
| | | | | | | | | |  | 14/11/14 |  | 14/11/14 | |



WELWYN GARDEN CITY.

Contract No:
PSL14/5609

Undrained Shear Strength in Triaxial Compression

without measurement of Pore Pressure

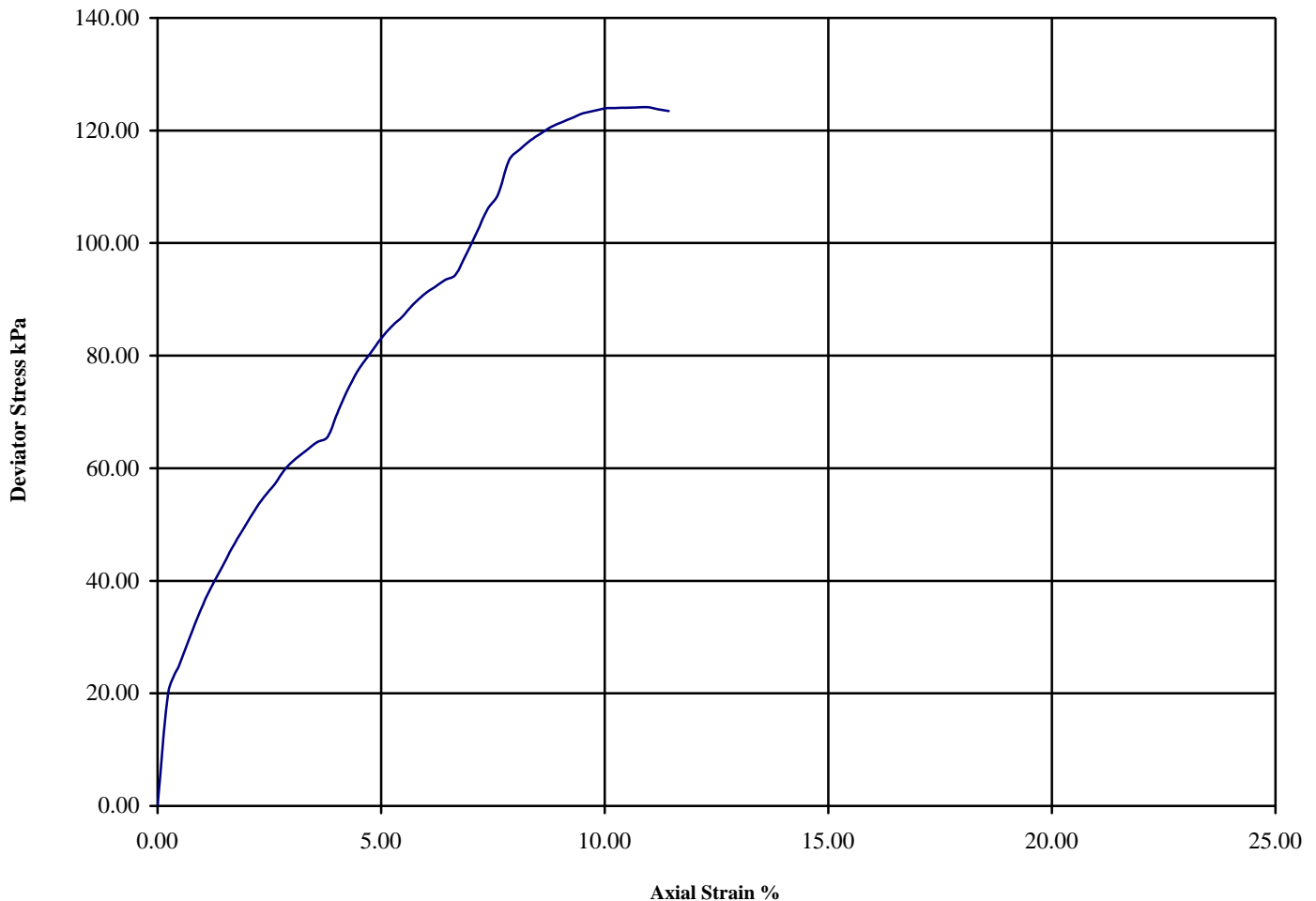
B.S. 1377 : Part 7 : Clause 9 : 1990



Hole Number: BH407

Depth (m): 6.00-6.45

Sample Number: 1

Sample Type: U



| Diameter (mm): | | 102 | Height (mm): | | 210 | Test: | 100mm Multistage | | | | | | |
|----------------|----------|---------|--------------|------------|--|---|------------------|----------|--|----------|---|----------|--|
| Specimen | Moisture | Bulk | Dry | Cell | Corr. Max. | Shear | Failure | Mode | Remarks | | | | |
| | Content | Density | Density | Pressure | Deviator | Strength | Strain | of | Sample taken from top of tube Rate of strain = 1.9 %/min Latex Membrane used 0.2 mm thickness Membrane Correction applied (kPa) | | | | |
| | (%) | (Mg/m3) | (Mg/m3) | (kPa) | Stress | Cu | (%) | Failure | | | | | |
| | | | | θ_3 | ($\theta_1 - \theta_3$) _f | $\frac{1}{2}(\theta_1 - \theta_3)$ _f | | | | | | | |
| | | | | | | | | | | | | | |
| A | 18 | 2.12 | 1.80 | 130 | 66 | 33 | 3.8 | Compound | 0.37 | 0.36 | 0.35 | | |
| | | | | 260 | 94 | 47 | 6.7 | | See summary of soil descriptions. | | | | |
| | | | | 390 | 124 | 62 | 11.0 | | Checked | Date | Approved | Date | |
| | | | | | | | | |  | 21/11/14 |  | 21/11/14 | |

| | | | |
|---|--|---------------------|----------------------------|
| PSL Professional Soils Laboratory | | WELWYN GARDEN CITY. | Contract No: PSL14/5609 |
|---|--|---------------------|----------------------------|

Undrained Shear Strength in Triaxial Compression

without measurement of Pore Pressure

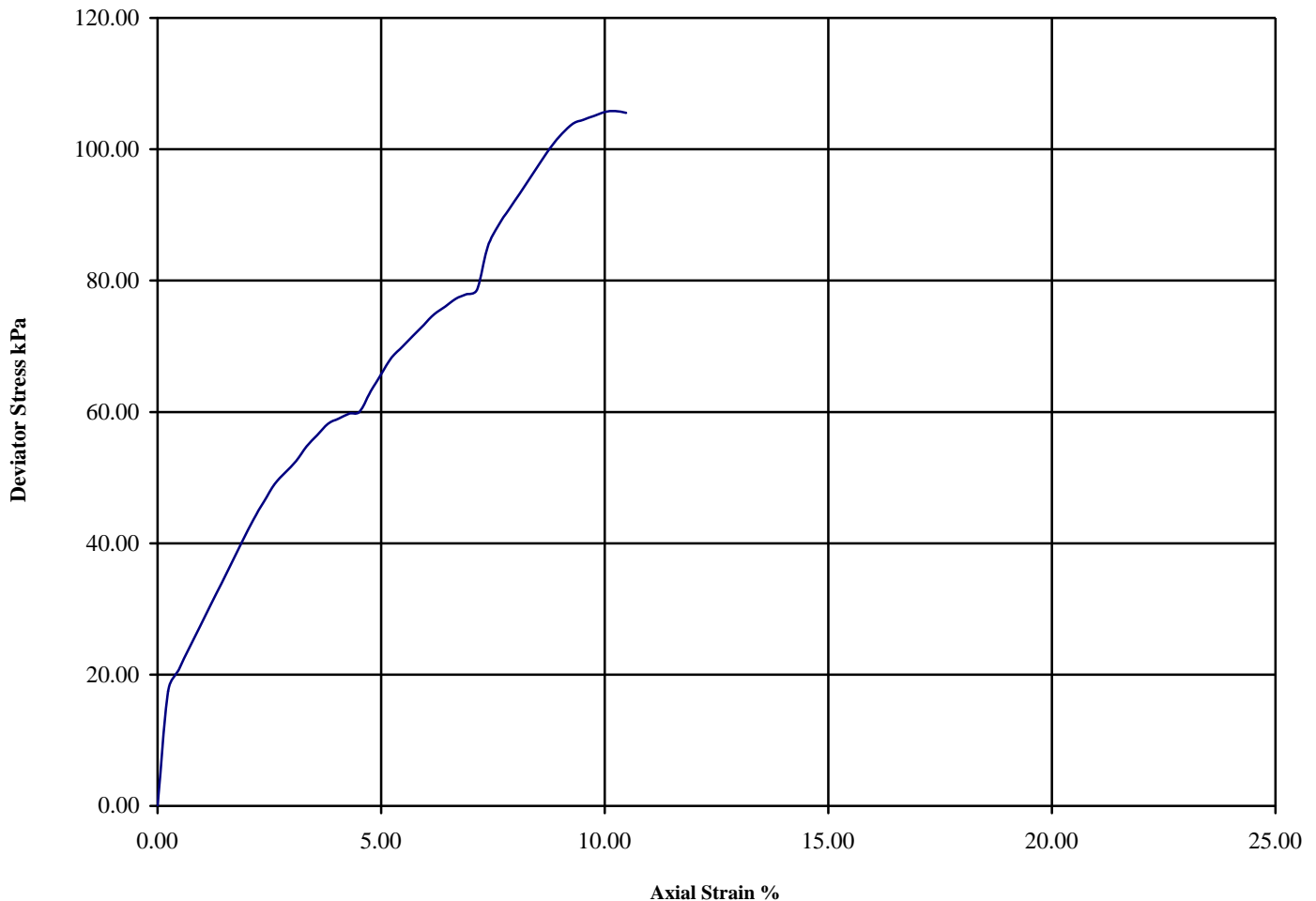
B.S. 1377 : Part 7 : Clause 9 : 1990



Hole Number: BH413

Depth (m): 1.50-1.95

Sample Number: 1

Sample Type: U



| Diameter (mm): | | 102 | Height (mm): | | 210 | Test: | 100mm Multistage | | | | | | |
|----------------|----------|---------|--------------|------------|--|---|------------------|----------|---|----------|---|----------|--|
| Specimen | Moisture | Bulk | Dry | Cell | Corr. Max. | Shear | Failure | Mode | Remarks | | | | |
| | Content | Density | Density | Pressure | Deviator | Strength | Strain | of | Sample taken from top of tube Rate of strain = 1.9 %/min Latex Membrane used 0.2 mm thickness Membrane Correction applied (kPa) 0.36 0.36 0.35 See summary of soil descriptions. | | | | |
| | (%) | (Mg/m3) | (Mg/m3) | (kPa) | Stress | Cu | (%) | Failure | | | | | |
| | | | | θ_3 | ($\theta_1 - \theta_3$) _f | $\frac{1}{2}(\theta_1 - \theta_3)$ _f | | | | | | | |
| | | | | | | | | | | | | | |
| A | 21 | 2.10 | 1.73 | 30 | 60 | 30 | 4.5 | Compound | | | | | |
| | | | | 60 | 79 | 39 | 7.1 | | | | | | |
| | | | | 90 | 106 | 53 | 10.2 | | Checked | Date | Approved | Date | |
| | | | | | | | | |  | 14/11/14 |  | 14/11/14 | |



WELWYN GARDEN CITY.

Contract No:
PSL14/5609

Undrained Shear Strength in Triaxial Compression

without measurement of Pore Pressure

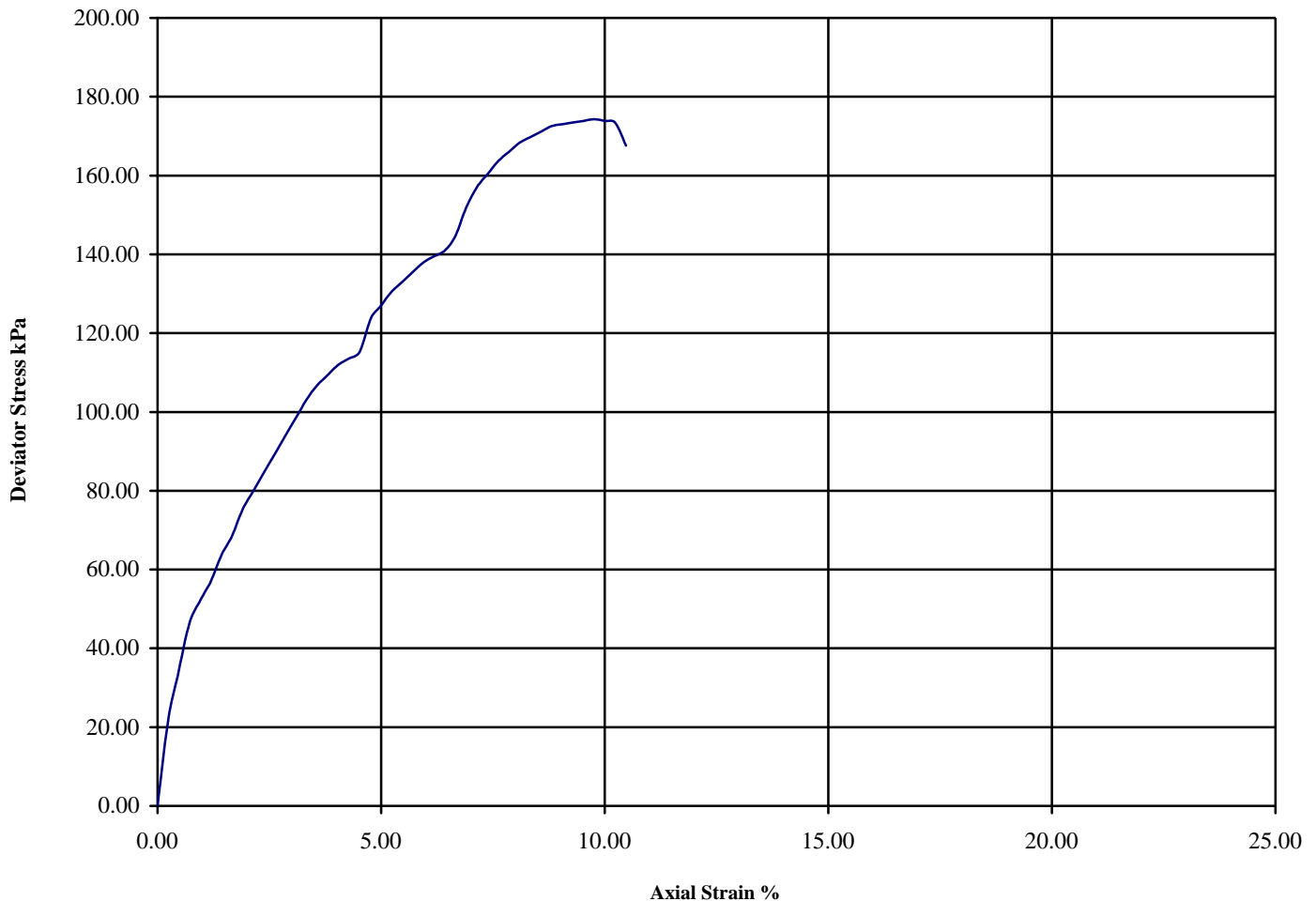
B.S. 1377 : Part 7 : Clause 9 : 1990

Hole Number: BH416

Depth (m): 3.50-3.95

Sample Number: 2

Sample Type: U



| Diameter (mm): | | 102 | Height (mm): | | 210 | Test: | 100mm Multistage | | | Remarks | | | |
|----------------|----------------------|-----------------------------------|----------------------------------|---------------------|----------------------------------|-------------------------|--------------------|-----------------|--|---|----------|-----------|----------|
| Specimen | Moisture Content (%) | Bulk Density (Mg/m ³) | Dry Density (Mg/m ³) | Cell Pressure (kPa) | Corr. Max. Deviator Stress (kPa) | Shear Strength Cu (kPa) | Failure Strain (%) | Mode of Failure | | Sample taken from top of tube Rate of strain = 1.9 %/min Latex Membrane used 0.2 mm thickness Membrane Correction applied (kPa) 0.36 0.36 0.35 See summary of soil descriptions. | | | |
| A | 23 | 2.00 | 1.62 | 70 | 115 | 58 | 4.5 | Compound | | | | | |
| | | | | 140 | 141 | 71 | 6.4 | | | | | | |
| | | | | 210 | 174 | 87 | 9.8 | | | | | | |
| | | | | | | | | | | Checked | Date | Approved | Date |
| | | | | | | | | | | <i>RL</i> | 14/11/14 | <i>RL</i> | 14/11/14 |



WELWYN GARDEN CITY.

Contract No:
PSL14/5609



Certificate of Analysis

Certificate Number 14-20389

14-Nov-14

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference 14-20389

Client Reference PSL14/5609

Contract Title Welwyn Garden City

Description 10 Soil samples.

Date Received 10-Nov-14

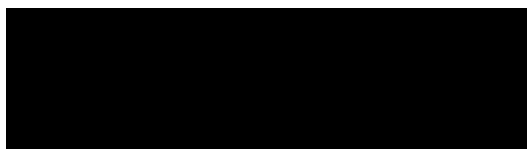
Date Started 11-Nov-14

Date Completed 14-Nov-14

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the scope of UKAS accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. Observations and interpretations are outside the scope of ISO 17025. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Rob Brown
Business Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 14-20389

Client Ref PSL14/5609

Contract Title Welwyn Garden City

| | | | | | | | | | | |
|----------------------|-----------|-----------|-----------|-----------|-------------|--------|-------------|-----------|-------------|-------------|
| Lab No | 728255 | 728256 | 728257 | 728258 | 728259 | 728260 | 728261 | 728262 | 728263 | 728264 |
| Sample ID | BH 401 | BH 402 | BH 403 | BH 405 | BH 406 | BH 409 | BH 410 | BH 411 | BH 415 | BH 416 |
| Depth | 1.00-1.00 | 4.50-4.95 | 5.40-5.80 | 5.10-5.50 | 10.50-10.95 | 8.40 | 18.00-18.50 | 3.50-4.00 | 28.50-28.95 | 10.50-10.95 |
| Other ID | | | | | | | | | | |
| Sample Type | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| Sampling Date | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s |
| Sampling Time | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s |

| Test | Method | LOD | Units | | | | | | | | | | |
|---------------------------------|-------------|------|-------|------|------|--------|--------|------|------|-------|------|------|--------|
| Metals | | | | | | | | | | | | | |
| Magnesium Aqueous Extract | DETSC 2076* | 10 | mg/l | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| Inorganics | | | | | | | | | | | | | |
| pH | DETSC 2008# | | | 11.3 | 9.1 | 7.8 | 6.9 | 8.1 | 8.5 | 8.6 | 7.8 | 8.5 | 8.4 |
| Chloride Aqueous Extract | DETSC 2055 | 1 | mg/l | 35 | 260 | 15 | 100 | 44 | 19 | 20 | 26 | 25 | 5.3 |
| Nitrate Aqueous Extract as NO3 | DETSC 2055 | 1 | mg/l | 1.8 | 1.6 | < 1.0 | < 1.0 | 2.1 | 2.9 | < 1.0 | 6.7 | 3.6 | < 1.0 |
| Sulphate Aqueous Extract as SO4 | DETSC 2076# | 10 | mg/l | 180 | 100 | 18 | 13 | < 10 | 10 | 41 | 45 | 39 | < 10 |
| Total Sulphur as S | DETSC 2320 | 0.01 | % | 0.07 | | < 0.01 | < 0.01 | | | 0.01 | | | < 0.01 |
| Total Sulphate as SO4 | DETSC 2321# | 0.01 | % | 0.18 | | 0.02 | 0.02 | | | 0.08 | | | 0.03 |

Information in Support of the Analytical Results

Our Ref 14-20389
 Client Ref PSL14/5609
 Contract Welwyn Garden City

Containers Received & Deviating Samples

| Lab No | Sample ID | Date Sampled | Containers Received | Holding time exceeded for tests | Inappropriate container for tests |
|--------|-------------------------|--------------|---------------------|---------------------------------|-----------------------------------|
| 728255 | BH 401 1.00-1.00 SOIL | | PG | Sample date not supplied | |
| 728256 | BH 402 4.50-4.95 SOIL | | GJ 500ml | Sample date not supplied | |
| 728257 | BH 403 5.40-5.80 SOIL | | GJ 500ml | Sample date not supplied | |
| 728258 | BH 405 5.10-5.50 SOIL | | GJ 500ml | Sample date not supplied | |
| 728259 | BH 406 10.50-10.95 SOIL | | PG | Sample date not supplied | |
| 728260 | BH 409 8.40 SOIL | | GJ 500ml | Sample date not supplied | |
| 728261 | BH 410 18.00-18.50 SOIL | | PG | Sample date not supplied | |
| 728262 | BH 411 3.50-4.00 SOIL | | PB 1L | Sample date not supplied | |
| 728263 | BH 415 28.50-28.95 SOIL | | PG | Sample date not supplied | |
| 728264 | BH 416 10.50-10.95 SOIL | | GJ 500ml | Sample date not supplied | |

Key: P-Plastic G-Bag G-Glass J-Jar B-Bottle

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time and/or inappropriate containers are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months





Final Report

Report Number: 14-12878 Issue-1

Initial Date of Issue: 31-Oct-14

Client: Delta Simons

Client Address: 3 Henley Office Park
Doddington Road
Lincoln
Lincolnshire
LN6 3QR

Contact(s): Paul Huteson

Project: 2342.18 - Welwyn Garden City

Quotation No.: **Date Received:** 27-Oct-14

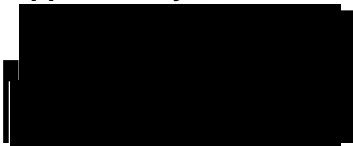
Order No.: **Date Instructed:** 27-Oct-14

No. of Samples: 10 **Results Due:** 31-Oct-14

Turnaround: 5
(Weekdays)

Date Approved: 31-Oct-14

Approved By:



Details: Darrell Hall, Laboratory Director

Results Summary - Water

Project: 2342.18 - Welwyn Garden City

| | | | | | | | | | | | | | | |
|----------------------|-----------------------------|------------|--------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Client: Delta Simons | Chemtest Job No.: | | | | 14-12878 | 14-12878 | 14-12878 | 14-12878 | 14-12878 | 14-12878 | 14-12878 | 14-12878 | 14-12878 | 14-12878 |
| Quotation No.: | Chemtest Sample ID.: | | | | 62736 | 62737 | 62738 | 62739 | 62740 | 62741 | 62742 | 62743 | 62744 | 62745 |
| Order No.: | Client Sample Ref.: | | | | | | | | | | | | | |
| | Client Sample ID.: | | | | BH208 | BH302D | BH8 | BH415 | BHB | BHC | BH402 | BH406 | BH403 | BH410 |
| | Sample Type: | | | | WATER | WATER | WATER | WATER | WATER | WATER | WATER | WATER | WATER | WATER |
| | Top Depth (m): | | | | | | | | | | | | | |
| | Bottom Depth(m): | | | | | | | | | | | | | |
| | Date Sampled: | | | | 22-Oct-14 | 22-Oct-14 | 22-Oct-14 | 22-Oct-14 | 22-Oct-14 | 22-Oct-14 | 22-Oct-14 | 22-Oct-14 | 22-Oct-14 | 22-Oct-14 |
| Determinand | Accred. | SOP | Units | LOD | | | | | | | | | | |
| pH | U | 1010 | | | 7.8 | 7.6 | 7.5 | 7.7 | 7.8 | 7.9 | 7.6 | 7.0 | 7.5 | 7.7 |
| Sulphate | U | 1220 | mg/l | 1 | 310 | 25 | 6.0 | 100 | 120 | 62 | 110 | 14 | 27 | 100 |

Report Information

Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable sample
- N/E not evaluated
- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVCOs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at our Coventry laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers

Sample Retention and Disposal

All soil samples will be retained for a period of 1 month following the date of the test report

All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.co.uk



Final Report

Report Number: 14-13235 Issue-1

Initial Date of Issue: 04-Nov-14

Client: Delta Simons

Client Address: 3 Henley Office Park
Doddington Road
Lincoln
Lincolnshire
LN6 3QR

Contact(s): Simon Steele

Project: WGC

Quotation No.:

Date Received: 31-Oct-14

Order No.: DS22893

Date Instructed: 31-Oct-14

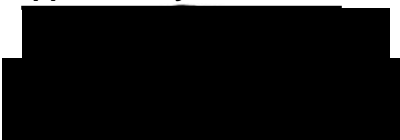
No. of Samples: 8

Results Due: 06-Nov-14

Turnaround:
(Weekdays) 5

Date Approved: 04-Nov-14

Approved By:



Details: Darrell Hall, Laboratory Director

The results reported herein relate only to the material supplied to the laboratory.
This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Results Summary - Water

Project: WGC

| | | | | | | | | | | | | |
|----------------------|-----------------------------|------------|--------------|------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Client: Delta Simons | Chemtest Job No.: | | | | 14-13235 | 14-13235 | 14-13235 | 14-13235 | 14-13235 | 14-13235 | 14-13235 | 14-13235 |
| Quotation No.: | Chemtest Sample ID.: | | | | 64403 | 64404 | 64405 | 64406 | 64407 | 64408 | 64409 | 64410 |
| Order No.: DS22893 | Client Sample Ref.: | | | | | | | | | | | |
| | Client Sample ID.: | | | | BH302D | BH8 | BHB | BHC | BH402 | BH403 | BH10 | BH415 |
| | Sample Type: | | | | WATER | WATER | WATER | WATER | WATER | WATER | WATER | WATER |
| | Top Depth (m): | | | | | | | | | | | |
| | Bottom Depth(m): | | | | | | | | | | | |
| | Date Sampled: | | | | | | | | | | | |
| Determinand | Accred. | SOP | Units | LOD | | | | | | | | |
| pH | U | 1010 | | | 8.1 | 7.9 | 7.8 | 7.8 | 7.3 | 7.8 | 7.9 | 7.8 |
| Sulphate | U | 1220 | mg/l | 1 | 13 | 9.0 | 74 | 74 | 76 | 31 | 110 | 76 |

Report Information

Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
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- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable sample
- N/E not evaluated
- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

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Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

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For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at our Coventry laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container

Sample Retention and Disposal

All soil samples will be retained for a period of 1 month following the date of the test report

All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage

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customerservices@chemtest.co.uk