EXPLORATION & TESTING ASSOCIATES

# Summary of in-situ density test results

| Project No. | Project Name |
|---|---|
| D10557AY | Giga One, Washington |

| Test Position Reference | Test reference | Depth to top m | Date of test | Soil Description | Site conditions during test | Test Type see below | In-situ Bulk Density $Mg/m^3$ | Moisture Content % | In-situ Dry Density $Mg/m^3$ | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| CCRT | CCRT | | 17/08/22 | Clay | Sunny | CCD | 2.02 | 19 | 1.70 | |
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Specifications

BS 1377 : Part 2 : 1990 Clause 3 Moisture content by oven drying method
BS 1377 : Part 9 : 1990 : In situ density tests, clauses :
SRDS 2.1 Sand replacement method ( Small pouring cylinder )
SRDL 2.2 Sand replacement method ( Large pouring cylinder )
CCD 2.4 Core cutter method

Approved By

Date
18/08/2022

N Hodson
Materials Director

UKAS Accredited Laboratory
No. 20632

EXPLORATION
& TESTING ASSOCIATES

**TEST CERTIFICATE**
**Determination of the Shear Strength Using the Laboratory Handvane**

**Client:** Groundwork Services (Durham) Ltd

**Project No:** D10557AY

**Project:** Envision, Washington

**Date Tested:** 17th August 2022

**Sampled By:** D. Rutter for ETA

**Ambient Temperature*: 19***°C

**Weather Conditions*:*** *Sunny, Dry*

**Vane Used:** Small

**Comments:**

| | Z8-L2 | Z8-L2 | Z8-L2 | Z8-L2 | Z8-L2 |
|---|---|---|---|---|---|
| Client Reference | CC522 | CC523 | CC524 | CC525 | CC526 |
| Reading 1 | 12.0 | 12.0 | 12.0 | 11.4 | 10.8 |
| Reading 2 | 10.8 | 12.0 | 12.0 | 12.0 | 12.0 |
| Reading 3 | 11.2 | 12.0 | 12.0 | 11.0 | 12.0 |
| Average Readings: | 11.3 | 12.0 | 12.0 | 11.4 | 11.6 |
| Equivalent Shear Stress (kN/m2) | **227** | **240** | **240** | **229** | **232** |

| | Z8-L2 | Z8-L2 | Z8-L2 | Z8-L2 | Z8-L2 |
|---|---|---|---|---|---|
| Client Reference | CC527 | CC528 | CC529 | CC530 | CC531 |
| Reading 1 | 12.0 | 12.0 | 12.0 | 11.6 | 11.4 |
| Reading 2 | 11.5 | 12.0 | 10.1 | 12.0 | 12.0 |
| Reading 3 | 12.0 | 12.0 | 12.0 | 11.4 | 12.0 |
| Average Readings: | 11.8 | 12.0 | 11.3 | 11.6 | 11.8 |
| Equivalent Shear Stress (kN/m2) | **237** | **240** | **227** | **233** | **236** |

**Approved By:** **N. Hodson**
**Materials Director**

**Date: 18th August 2022**

EXPLORATION
& TESTING ASSOCIATES

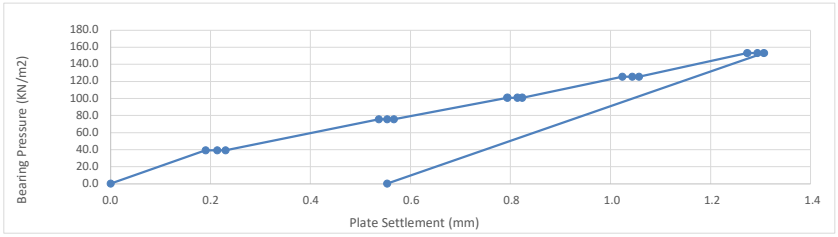
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD

Tel. (+44) 0191 389 6543

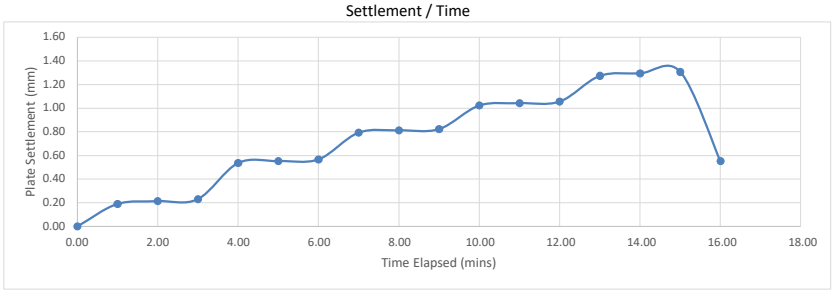
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557AX |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 17/08/2022 |
| | Thistle Road | **Weather Conditions** | Clear |
| | Littleburn Industrial Estate | **Air Temperature °C** | 14°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 22t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Denisty & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 1 - Road Zone 10 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 153 | **Maximum Deformation (mm)** | 1.31 |
| **Pressure at 1.25mm penetration (kPa)** | 150 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 108.1 |
| **Calculated CBR (%) at 1.25mm** | 17 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

**Unless otherwise stated, this test has been carried out in accordance with the published standard, with no deviations from the test method outlined.**

**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

Materials Director

Approved Date: 18 August 2022

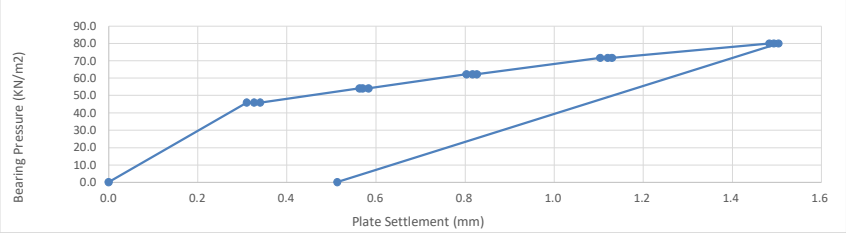
EXPLORATION
& TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

UKAS TESTING

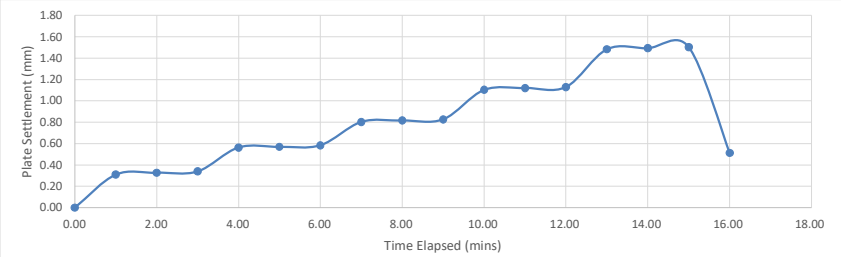
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557AX |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 17/08/2022 |
| | Thistle Road | **Weather Conditions** | Clear |
| | Littleburn Industrial Estate | **Air Temperature °C** | 14°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 22t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Denisty & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 2 - Road Zone 10 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 80 | **Maximum Deformation (mm)** | 1.50 |
| **Pressure at 1.25mm penetration (kPa)** | 75 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 49.7 |
| **Calculated CBR (%) at 1.25mm** | 5.1 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

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**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

Materials Director

Approved Date: 18 August 2022

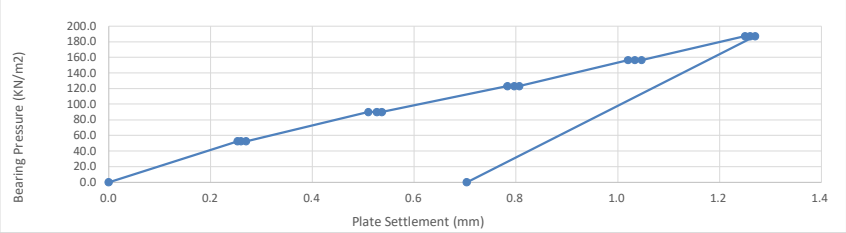
EXPLORATION
& TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

UKAS TESTING

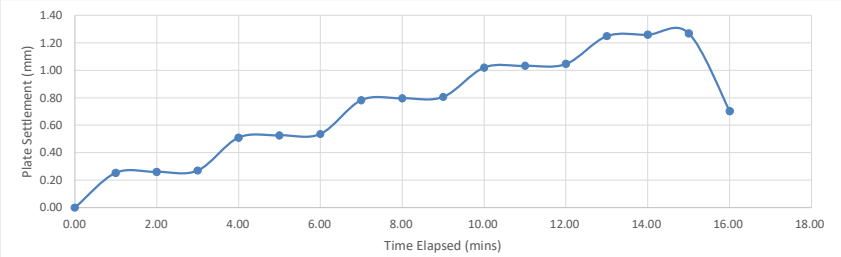
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557AX |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 17/08/2022 |
| | Thistle Road | **Weather Conditions** | Clear |
| | Littleburn Industrial Estate | **Air Temperature °C** | 14°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 22t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Denisty & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 3 - Road Zone 10 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 187 | **Maximum Deformation (mm)** | 1.27 |
| **Pressure at 1.25mm penetration (kPa)** | 187 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 137.9 |
| **Calculated CBR (%) at 1.25mm** | 24.9 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

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**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

Materials Director

Approved Date: 18 August 2022

EXPLORATION
& TESTING ASSOCIATES

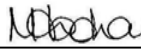
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD T: 0191 389 6543

UKAS TESTING

***Test Report***

| | |
|---|---|
| ***Client*** | Groundwork Services (Durham) Limited |
| ***Address*** | Littleburn Industrial Estate<br>Langley Moor<br>Durham<br>DH7 8HJ |
| ***F.A.O*** | Paul Barton |
| ***Project:*** | Giga One Factory, Washington |
| ***Project Number:*** | D10557AZ |
| ***Report Number:*** | L22-722 |
| ***Date Received:*** | 18th August 2022 |

| | |
|---|---|
| ***Testing Required:*** | Insitu Density by Core Cutter - BS:1377-9:1990 Clause 2.3<br><br>Hand Shear Vane*<br><br>Vertical Deformation and Strength Characteristics by the Incremental Plate Load Test - BS:1377-9:1990 Clause 4.1<br><br>Determination of Equivalent CBR Value using the Plate Bearing Test - Design Manual for Roads and Bridges, Volume 7: Pavement Design and Maintenance - Foundations HD25/9 |
| ***Date Started:*** | 18th August 2022 |
| ***Date Finished:*** | 22nd August 2022 |

| | |
|---|---|
| ***Report Issue Date:*** | 22nd August 2022 |
| ***Reviewed By:*** |  |
| | Natalie Hodson - Materials Director |
| ***Authorised By:*** |  |
| | Nik O'Brien - Laboratory Manager |
| ***Remarks:*** | (*) denotes testing is outside of UKAS Scope of Accreditation. |
| | (+) denotes subcontracted testing. |

Samples will be stored for one month after the report has been issue before being disposed of.

The published results appertain only to the specimens tested.

Exploration and Testing Associates Limited, registered in England and Wales #11803869 at 8B, Bowburn South Industrial Estate, Bowburn, Durham, DH6 5AD

EXPLORATION & TESTING ASSOCIATES

# Summary of in-situ density test results

| Project No. | Project Name |
|---|---|
| D10557AZ | Giga One, Washington |

| Test Position Reference | Test reference | Depth to top m | Date of test | Soil Description | Site conditions during test | Test Type see below | In-situ Bulk Density $Mg/m^3$ | Moisture Content % | In-situ Dry Density $Mg/m^3$ | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Z8-L2-CC1 | CC531 | | 18/08/22 | Clay | Clear | CCD | 1.92 | 20 | 1.60 | |
| Z8-L2-CC2 | CC532 | | 18/08/22 | Clay | Clear | CCD | 2.11 | 20 | 1.77 | |
| Z8-L2-CC3 | CC533 | | 18/08/22 | Clay | Clear | CCD | 2.01 | 23 | 1.64 | |
| Z8-L2-CC4 | CC534 | | 18/08/22 | Clay | Clear | CCD | 1.91 | 17 | 1.63 | |
| Z8-L3-CC5 | CC535 | | 18/08/22 | Clay | Clear | CCD | 2.01 | 20 | 1.68 | |
| Z8-L3-CC6 | CC536 | | 18/08/22 | Clay | Clear | CCD | 2.02 | 13 | 1.79 | |
| Z8-L3-CC7 | CC537 | | 18/08/22 | Clay | Clear | CCD | 2.09 | 35 | 1.55 | |
| Z8-L3-CC8 | CC538 | | 18/08/22 | Clay | Clear | CCD | 2.07 | 20 | 1.73 | |
| | | | | | | | | | | |
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| | | | | | | | | | | |

Specifications

BS 1377 : Part 2 : 1990 Clause 3 Moisture content by oven drying method
BS 1377 : Part 9 : 1990 : In situ density tests, clauses :
SRDS 2.1 Sand replacement method ( Small pouring cylinder )
SRDL 2.2 Sand replacement method ( Large pouring cylinder )
CCD 2.4 Core cutter method

Approved By

Date
19/08/2022

N Hodson
Materials Director

UKAS Accredited Laboratory
No. 20632

TEST CERTIFICATE
Determination of the Shear Strength Using the Laboratory Handvane

Client: Groundwork Services (Durham) Ltd  Project No: D10557AZ

Project: Envision, Washington  Date Tested: 18th August 2022

Sampled By: D. Tennant for ETA  Ambient Temperature: 17°C

Weather Conditions: Clear  Vane Used: Small

Comments:

| | Z8-L2 | Z8-L2 | Z8-L2 | Z8-L2 | Z8-L3 | Z8-L3 |
|---|---|---|---|---|---|---|
| Client Reference | CC531 | CC532 | CC533 | CC534 | CC535 | CC536 |
| Reading 1 | 12.0 | 11.2 | 10.6 | 11.1 | 12.0 | 12.0 |
| Reading 2 | 11.4 | 11.8 | 9.8 | 11.0 | 11.3 | 12.0 |
| Reading 3 | 11.0 | 11.8 | 10.1 | 11.4 | 11.3 | 12.0 |
| Average Readings: | 11.4 | 11.6 | 10.2 | 11.3 | 11.5 | 12.0 |
| Equivalent Shear Stress (kN/m2) | 229 | 232 | 203 | 227 | 231 | 240 |

| | Z8-L3 | Z8-L3 |
|---|---|---|
| Client Reference | CC537 | CC538 |
| Reading 1 | 7.8 | 10.1 |
| Reading 2 | 7.6 | 11.0 |
| Reading 3 | 7.8 | 10.8 |
| Average Readings: | 7.7 | 10.6 |
| Equivalent Shear Stress (kN/m2) | 155 | 213 |

Approved By: 

N. Hodson
Materials Director

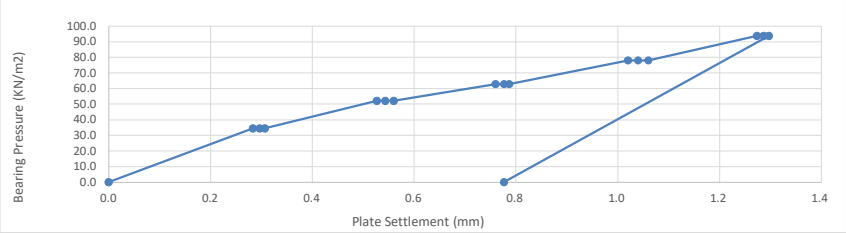
Date: 19th August 2022

EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

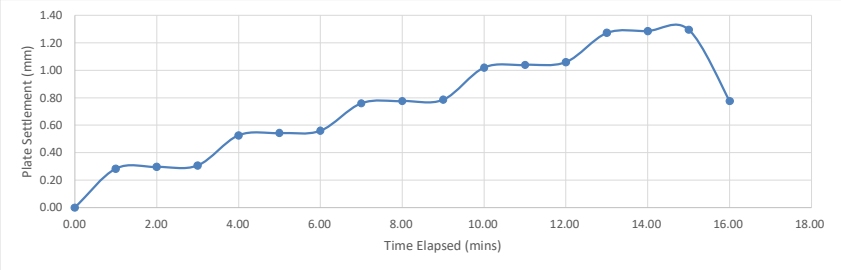
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557AY |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 18/08/2022 |
| | Thistle Road | **Weather Conditions** | Clear |
| | Littleburn Industrial Estate | **Air Temperature °C** | 17°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Denisty & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 1 - Zone 7 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 94 | **Maximum Deformation (mm)** | 1.30 |
| **Pressure at 1.25mm penetration (kPa)** | 92 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 62.8 |
| **Calculated CBR (%) at 1.25mm** | 7.3 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

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**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Tennant

Materials Technician

**Approved By:**

Materials Director

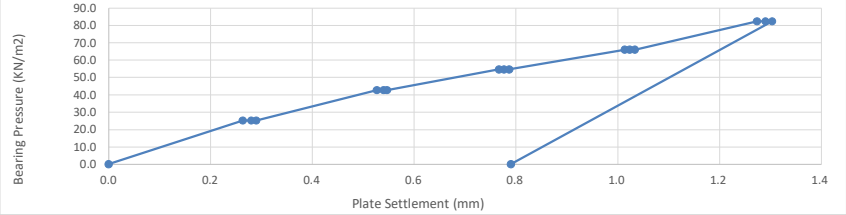
Approved Date: 19 August 2022

EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

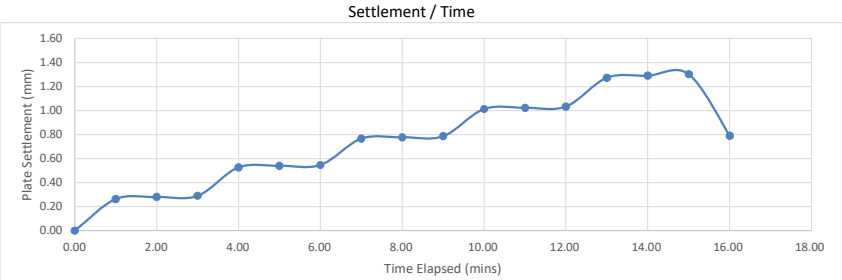
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557AY |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 18/08/2022 |
| | Thistle Road | **Weather Conditions** | Clear |
| | Littleburn Industrial Estate | **Air Temperature °C** | 17°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Denisty & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 2 - Zone 7 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 82 | **Maximum Deformation (mm)** | 1.30 |
| **Pressure at 1.25mm penetration (kPa)** | 81 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 54.4 |
| **Calculated CBR (%) at 1.25mm** | 5.8 | | |

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**Test Carried Out By:**

D. Tennant

Materials Technician

**Approved By:**

Materials Director

Approved Date: 19 August 2022

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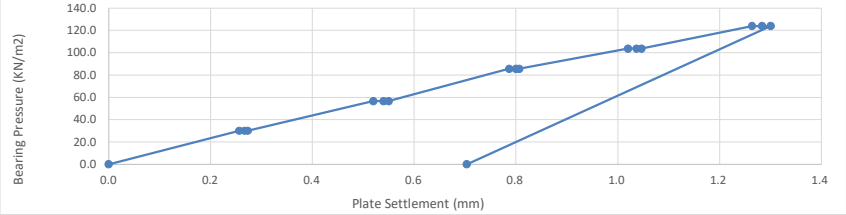
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

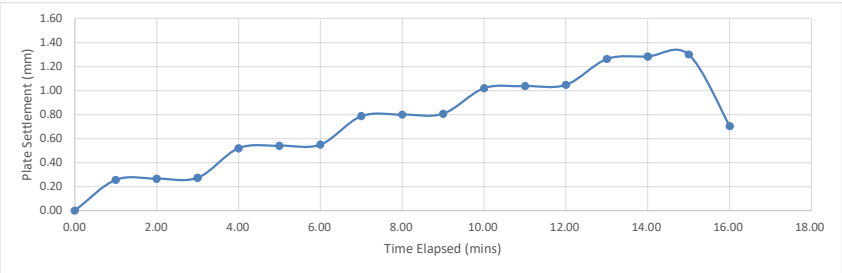
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557AY |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 18/08/2022 |
| | Thistle Road | **Weather Conditions** | Clear |
| | Littleburn Industrial Estate | **Air Temperature °C** | 17°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Denisty & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 3 - Zone 7 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 124 | **Maximum Deformation (mm)** | 1.30 |
| **Pressure at 1.25mm penetration (kPa)** | 123 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 86.4 |
| **Calculated CBR (%) at 1.25mm** | 12 | | |

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In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

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**Test Carried Out By:**

D. Tennant

Materials Technician

**Approved By:**

Materials Director

Approved Date: 19 August 2022

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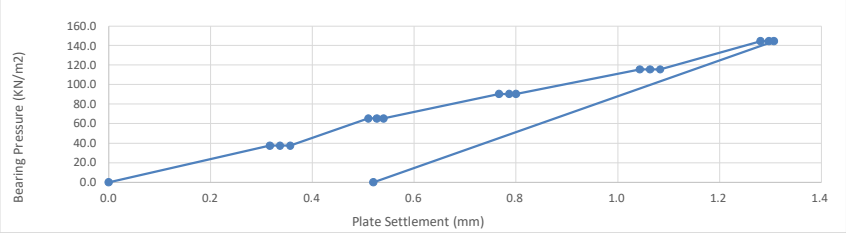
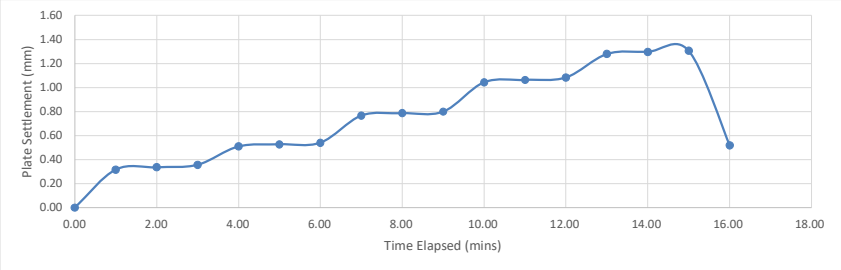
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557AY |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 18/08/2022 |
| | Thistle Road | **Weather Conditions** | Clear |
| | Littleburn Industrial Estate | **Air Temperature °C** | 17°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Denisty & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 4 - Zone 7 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 145 | **Maximum Deformation (mm)** | 1.31 |
| **Pressure at 1.25mm penetration (kPa)** | 140 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 100.2 |
| **Calculated CBR (%) at 1.25mm** | 15 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

**Unless otherwise stated, this test has been carried out in accordance with the published standard, with no deviations from the test method outlined.**

**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Tennant

Materials Technician

**Approved By:**

Materials Director

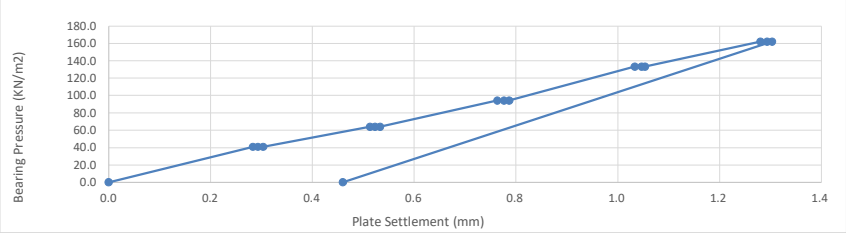
Approved Date: 19 August 2022

EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

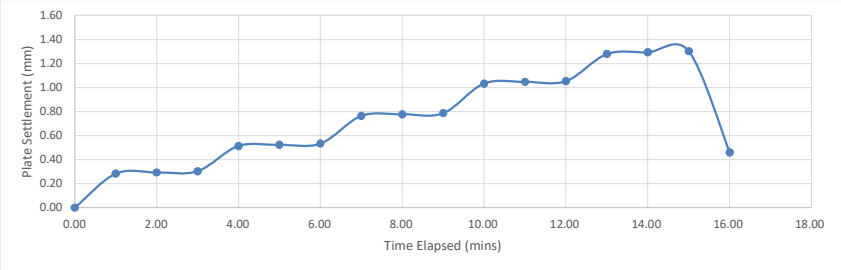
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557AY |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 18/08/2022 |
| | Thistle Road | **Weather Conditions** | Clear |
| | Littleburn Industrial Estate | **Air Temperature °C** | 17°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Denisty & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 5 - Zone 7 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 162 | **Maximum Deformation (mm)** | 1.30 |
| **Pressure at 1.25mm penetration (kPa)** | 158 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 114.8 |
| **Calculated CBR (%) at 1.25mm** | 19 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

**Unless otherwise stated, this test has been carried out in accordance with the published standard, with no deviations from the test method outlined.**

**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Tennant

Materials Technician

**Approved By:**

Materials Director

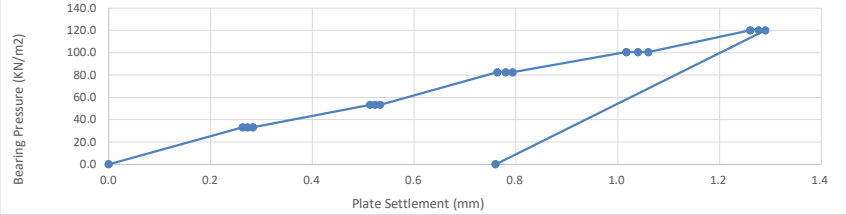
Approved Date: 19 August 2022

EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

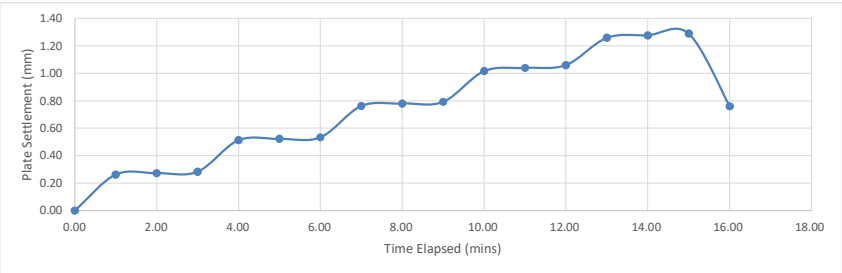
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557AY |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 18/08/2022 |
| | Thistle Road | **Weather Conditions** | Clear |
| | Littleburn Industrial Estate | **Air Temperature °C** | 17°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Denisty & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 6 - Zone 7 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 120 | **Maximum Deformation (mm)** | 1.29 |
| **Pressure at 1.25mm penetration (kPa)** | 119 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 83.7 |
| **Calculated CBR (%) at 1.25mm** | 11 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

**Unless otherwise stated, this test has been carried out in accordance with the published standard, with no deviations from the test method outlined.**

**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Tennant

Materials Technician

**Approved By:**

Materials Director

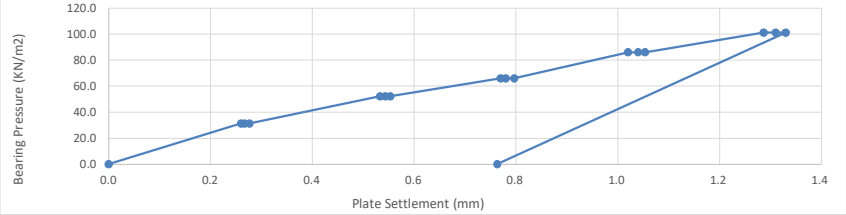
Approved Date: 19 August 2022

EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

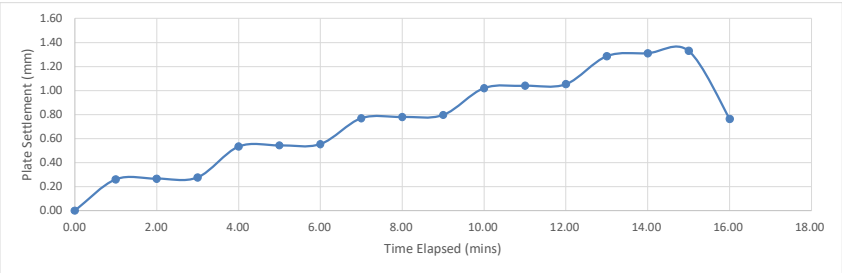
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557AY |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 18/08/2022 |
| | Thistle Road | **Weather Conditions** | Clear |
| | Littleburn Industrial Estate | **Air Temperature °C** | 17°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Denisty & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 7 - Zone 7 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 101 | **Maximum Deformation (mm)** | 1.33 |
| **Pressure at 1.25mm penetration (kPa)** | 99 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 68.0 |
| **Calculated CBR (%) at 1.25mm** | 8 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

**Unless otherwise stated, this test has been carried out in accordance with the published standard, with no deviations from the test method outlined.**

**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Tennant

Materials Technician

**Approved By:**

Materials Director

Approved Date: 19 August 2022

EXPLORATION
& TESTING ASSOCIATES

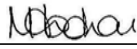
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD T: 0191 389 6543

UKAS TESTING

**Test Report**

| | |
|---|---|
| **Client** | Groundwork Services (Durham) Limited |
| **Address** | Littleburn Industrial Estate<br>Langley Moor<br>Durham<br>DH7 8HJ |
| **F.A.O** | Paul Barton |
| **Project:** | Giga One Factory, Washington |
| **Project Number:** | D10557BA |
| **Report Number:** | L22-728 |
| **Date Received:** | 19th August 2022 |

| | |
|---|---|
| **Testing Required:** | Insitu Density by Core Cutter - BS:1377-9:1990 Clause 2.3<br><br>Hand Shear Vane*<br><br>Vertical Deformation and Strength Characteristics by the Incremental Plate Load Test - BS:1377-9:1990 Clause 4.1<br><br>Determination of Equivalent CBR Value using the Plate Bearing Test - Design Manual for Roads and Bridges, Volume 7: Pavement Design and Maintenance - Foundations HD25/9 |
| **Date Started:** | 19th August 2022 |
| **Date Finished:** | 22nd August 2022 |

| | |
|---|---|
| **Report Issue Date:** | 22nd August 2022 |
| **Reviewed By:** |  |
| | Natalie Hodson - Materials Director |
| **Authorised By:** |  |
| | Nik O'Brien - Laboratory Manager |
| **Remarks:** | (*) denotes testing is outside of UKAS Scope of Accreditation. |
| | (+) denotes subcontracted testing. |

Samples will be stored for one month after the report has been issue before being disposed of.

The published results appertain only to the specimens tested.

Exploration and Testing Associates Limited, registered in England and Wales #11803869 at
8B, Bowburn South Industrial Estate, Bowburn, Durham, DH6 5AD

EXPLORATION & TESTING ASSOCIATES

# Summary of in-situ density test results

| Project No. | Project Name |
|---|---|
| D10557BA | Giga One, Washington |

| Test Position Reference | Test reference | Depth to top m | Date of test | Soil Description | Site conditions during test | Test Type see below | In-situ Bulk Density $Mg/m^3$ | Moisture Content % | In-situ Dry Density $Mg/m^3$ | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Z8-CC1-433401/558633 | CC539 | | 19/08/22 | Clay | Clear | CCD | 1.91 | 20 | 1.60 | |
| Z8-CC2-433396/558642 | CC540 | | 19/08/22 | Clay | Clear | CCD | 1.96 | 20 | 1.64 | |
| Z8-CC3-433390/558655 | CC541 | | 19/08/22 | Clay | Clear | CCD | 2.02 | 18 | 1.71 | |
| Z8-CC4-433403/558663 | CC542 | | 19/08/22 | Clay | Clear | CCD | 2.00 | 14 | 1.75 | |
| | | | | | | | | | | |
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| | | | | | | | | | | |

Specifications

BS 1377 : Part 2 : 1990 Clause 3 Moisture content by oven drying method
BS 1377 : Part 9 : 1990 : In situ density tests, clauses :
SRDS 2.1 Sand replacement method ( Small pouring cylinder )
SRDL 2.2 Sand replacement method ( Large pouring cylinder )
CCD 2.4 Core cutter method

Approved By

Date 22/08/2022

N Hodson

Materials Director

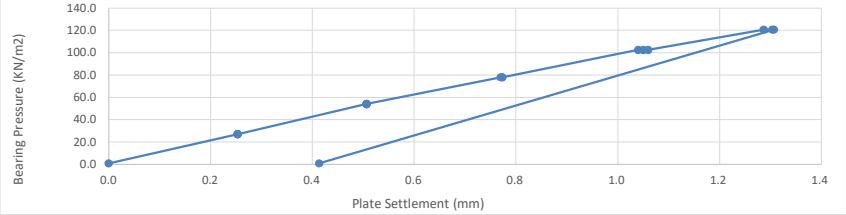
UKAS Accredited Laboratory No. 20632

EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

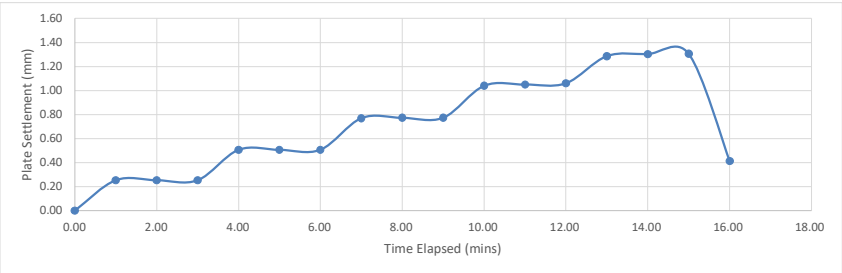
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BA |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 19/08/2022 |
| | Thistle Road | **Weather Conditions** | Clear |
| | Littleburn Industrial Estate | **Air Temperature °C** | 15°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 40t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Denisty & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 1 - Zone 10 433106/558828 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 121 | **Maximum Deformation (mm)** | 1.31 |
| **Pressure at 1.25mm penetration (kPa)** | 118 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 82.6 |
| **Calculated CBR (%) at 1.25mm** | 11 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

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**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Tennant

Materials Technician

**Approved By:**

Materials Director

Approved Date: 22 August 2022

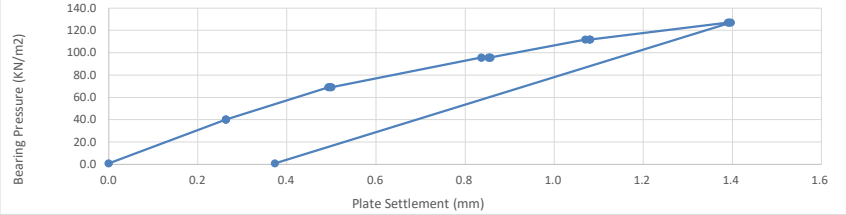
EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

UKAS TESTING

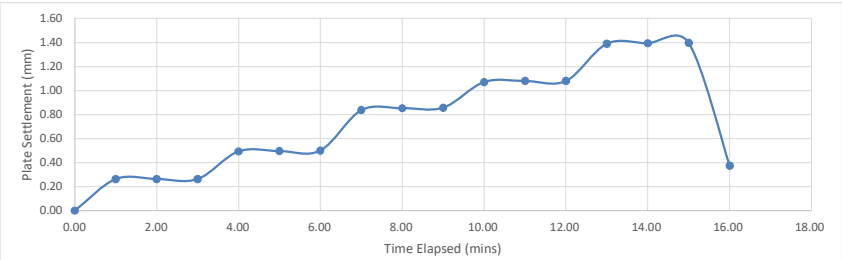
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BA |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 19/08/2022 |
| | Thistle Road | **Weather Conditions** | Clear |
| | Littleburn Industrial Estate | **Air Temperature °C** | 15°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 40t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Denisty & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 2 - Zone 10 433135/558850 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 127 | **Maximum Deformation (mm)** | 1.40 |
| **Pressure at 1.25mm penetration (kPa)** | 120 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 84.5 |
| **Calculated CBR (%) at 1.25mm** | 12 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

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**Test Carried Out By:**

D. Tennant

Materials Technician

**Approved By:**

Materials Director

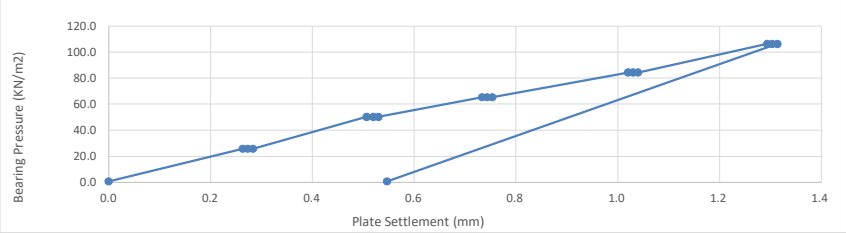
Approved Date: 22 August 2022

EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

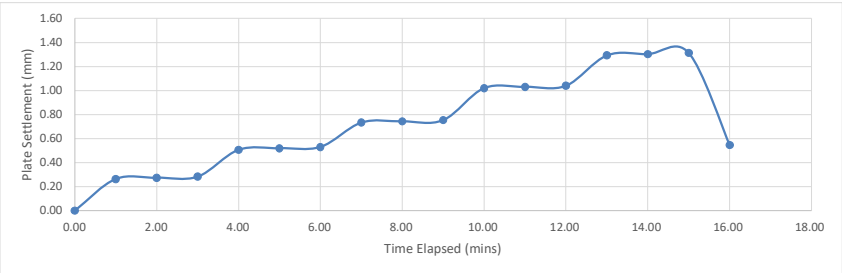
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BA |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 19/08/2022 |
| | Thistle Road | **Weather Conditions** | Clear |
| | Littleburn Industrial Estate | **Air Temperature °C** | 15°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Denisty & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 3 - Attenuation Tank |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 106 | **Maximum Deformation (mm)** | 1.31 |
| **Pressure at 1.25mm penetration (kPa)** | 103 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 70.9 |
| **Calculated CBR (%) at 1.25mm** | 8.8 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

**Unless otherwise stated, this test has been carried out in accordance with the published standard, with no deviations from the test method outlined.**

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**Test Carried Out By:**

D. Tennant

Materials Technician

**Approved By:**

Materials Director

Approved Date: 22 August 2022

**TEST CERTIFICATE**
**Determination of the Shear Strength Using the Laboratory Handvane**

**Client:** Groundwork Services (Durham) Ltd

**Project No:** D10557BA

**Project:** Envision, Washington

**Date Tested:** 19th August 2022

**Sampled By:** D. Tennant for ETA

**Ambient Temperature*: 17***°C

**Weather Conditions*:*** *Clear*

**Vane Used:** Small

**Comments:**

| | **433401-558633** | **433396-558642** | **433390-558655** | **433403-558663** |
|---|---|---|---|---|
| **Client Reference** | **Z8-CC539** | **Z8-CC540** | **Z8-CC541** | **Z8-CC542** |
| **Reading 1** | 9.6 | 11.6 | 10.6 | 9.6 |
| **Reading 2** | 10.2 | 10.8 | 9.8 | 10.2 |
| **Reading 3** | 10.4 | 11.2 | 11.2 | 10.0 |
| **Average Readings:** | 10.0 | 11.2 | 10.5 | 9.9 |
| **Equivalent Shear Stress (kN/m2)** | **201** | **224** | **211** | **199** |

**Approved By:** N. Hodson .

**N. Hodson**
**Materials Director**

**Date: 22th August 2022**



Exploration and Testing Associates Limited, Unit 8B Bowburn South Industrial Estate, Durham, DH6 5AD

EXPLORATION
& TESTING ASSOCIATES

Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD T: 0191 389 6543

UKAS TESTING

**Test Report**

| | |
|---|---|
| **Client** | Groundwork Services (Durham) Limited |
| **Address** | Littleburn Industrial Estate<br>Langley Moor<br>Durham<br>DH7 8HJ |
| **F.A.O** | Paul Barton |
| **Project:** | Giga One Factory, Washington |
| **Project Number:** | D10557BE |
| **Report Number:** | L22-740 |
| **Date Received:** | 25th August 2022 |

| | |
|---|---|
| **Testing Required:** | Insitu Density by Core Cutter - BS:1377-9:1990 Clause 2.3<br><br>Hand Shear Vane*<br><br>Vertical Deformation and Strength Characteristics by the Incremental Plate Load Test - BS:1377-9:1990 Clause 4.1<br><br>Determination of Equivalent CBR Value using the Plate Bearing Test - Design Manual for Roads and Bridges, Volume 7: Pavement Design and Maintenance - Foundations HD25/9 |
| **Date Started:** | 25th August 2022 |
| **Date Finished:** | 26th August 2022 |

| | |
|---|---|
| **Report Issue Date:** | 26th August 2022 |
| **Reviewed By:** |  |
| | Natalie Hodson - Materials Director |
| **Authorised By:** |  |
| | Nik O'Brien - Laboratory Manager |
| **Remarks:** | (*) denotes testing is outside of UKAS Scope of Accreditation. |
| | (+) denotes subcontracted testing. |

Samples will be stored for one month after the report has been issue before being disposed of.

The published results appertain only to the specimens tested.

EXPLORATION & TESTING ASSOCIATES

# Summary of in-situ density test results

| Project No. | Project Name |
|---|---|
| D10557BE | Giga One, Washington |

| Test Position Reference | Test reference | Depth to top m | Date of test | Soil Description | Site conditions during test | Test Type see below | In-situ Bulk Density $Mg/m^3$ | Moisture Content % | In-situ Dry Density $Mg/m^3$ | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| CC552-RT | CC9 | | 25/08/22 | Clay | Sunny | CCD | 2.05 | 21 | 1.69 | |
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Specifications

BS 1377 : Part 2 : 1990 Clause 3 Moisture content by oven drying method
BS 1377 : Part 9 : 1990 : In situ density tests, clauses :
SRDS 2.1 Sand replacement method ( Small pouring cylinder )
SRDL 2.2 Sand replacement method ( Large pouring cylinder )
CCD 2.4 Core cutter method

Approved By

Date
26/08/2022

N Hodson
Materials Director

UKAS Accredited Laboratory
No. 20632

EXPLORATION & TESTING ASSOCIATES

# Summary of in-situ density test results

| Project No. | Project Name |
|---|---|
| D10557BE | Giga One, Washington |

| Test Position Reference | Test reference | Depth to top m | Date of test | Soil Description | Site conditions during test | Test Type see below | In-situ Bulk Density $Mg/m^3$ | Moisture Content % | In-situ Dry Density $Mg/m^3$ | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| CC522-RT | CC1 | | 25/08/22 | Clay | Sunny | CCD | 2.07 | 19 | 1.75 | |
| CC553-RT | CC10 | | 25/08/22 | Clay | Sunny | CCD | 2.04 | 21 | 1.69 | |
| CC554-RT | CC11 | | 25/08/22 | Clay | Sunny | CCD | 2.06 | 21 | 1.70 | |
| CC545-RT | CC12 | | 25/08/22 | Clay | Sunny | CCD | 2.11 | 19 | 1.77 | |
| CC546-RT | CC13 | | 25/08/22 | Clay | Sunny | CCD | 2.06 | 20 | 1.72 | |
| CC524-RT | CC2 | | 25/08/22 | Clay | Sunny | CCD | 2.13 | 21 | 1.76 | |
| CC528-RT | CC3 | | 25/08/22 | Clay | Sunny | CCD | 2.13 | 22 | 1.75 | |
| CC529-RT | CC4 | | 25/08/22 | Clay | Sunny | CCD | 2.03 | 19 | 1.71 | |
| CC531-RT | CC5 | | 25/08/22 | Clay | Sunny | CCD | 2.04 | 23 | 1.66 | |
| CC534-RT | CC6 | | 25/08/22 | Clay | Sunny | CCD | 2.04 | 21 | 1.69 | |
| CC536-RT | CC7 | | 25/08/22 | Clay | Sunny | CCD | 1.99 | 18 | 1.69 | |
| CC537-RT | CC8 | | 25/08/22 | Clay | Sunny | CCD | 2.00 | 19 | 1.68 | |

Specifications

BS 1377 : Part 2 : 1990 Clause 3 Moisture content by oven drying method

BS 1377 : Part 9 : 1990 : In situ density tests, clauses :

SRDS 2.1 Sand replacement method ( Small pouring cylinder )

SRDL 2.2 Sand replacement method ( Large pouring cylinder )

CCD 2.4 Core cutter method

Approved By

Date

26/08/2022

N Hodson

Materials Director

UKAS Accredited Laboratory No. 20632

**TEST CERTIFICATE**
**Determination of the Shear Strength Using the Laboratory Handvane**

**Client:** Groundwork Services (Durham) Ltd

**Project No:** D10557BE

**Project:** Envision, Washington

**Date Tested:** 24th August 2022

**Sampled By:** D. Rutter for ETA

**Ambient Temperature:** ***20***°C

**Weather Conditions:** *Overcast*

**Vane Used:** Small

**Comments:**

| | Z4-L2 CC1 | Z4-L2 CC2 | Z4-L2 CC3 | Z4-L2 CC4 | Z4-L2 CC5 |
|---|---|---|---|---|---|
| Client Reference | CC559 | CC560 | CC561 | CC562 | CC563 |
| Reading 1 | 9.0 | 8.0 | 12.0 | 10.8 | 12.0 |
| Reading 2 | 8.9 | 9.8 | 11.8 | 10.6 | 12.0 |
| Reading 3 | 12.0 | 12.0 | 10.5 | 12.0 | 11.4 |
| Average Readings: | 9.9 | 9.9 | 11.4 | 11.1 | 11.8 |
| Equivalent Shear Stress (kN/m2) | **199** | **199** | **229** | **223** | **236** |
| | **Z4-L2 CC6** | **Z4-L2 CC7** | **Z4-L2 CC8** | **Z4-L2 CC9** | **Z4-L2 CC10** |
| Client Reference | CC564 | CC565 | CC566 | CC567 | CC568 |
| Reading 1 | 12.0 | 12.0 | 12.0 | 9.4 | 10.6 |
| Reading 2 | 10.8 | 12.0 | 10.8 | 11.8 | 12.0 |
| Reading 3 | 11.8 | 12.0 | 9.1 | 12.0 | 9.8 |
| Average Readings: | 11.5 | 12.0 | 10.6 | 11.0 | 10.8 |
| Equivalent Shear Stress (kN/m2) | **231** | **240** | **213** | **221** | **216** |
| | **Z4-L2 CC11** | **Z4-L2 CC12** | **Z4-L2 CC13** | | |
| Client Reference | CC569 | CC570 | CC571 | | |
| Reading 1 | 8.8 | 10.5 | 12.0 | | |
| Reading 2 | 11.0 | 11.7 | 10.8 | | |
| Reading 3 | 11.4 | 12.0 | 12.0 | | |
| Average Readings: | 10.4 | 11.4 | 11.6 | | |
| Equivalent Shear Stress (kN/m2) | **208** | **228** | **232** | | |

**Approved By:** 

**Date: 26th August 2022**

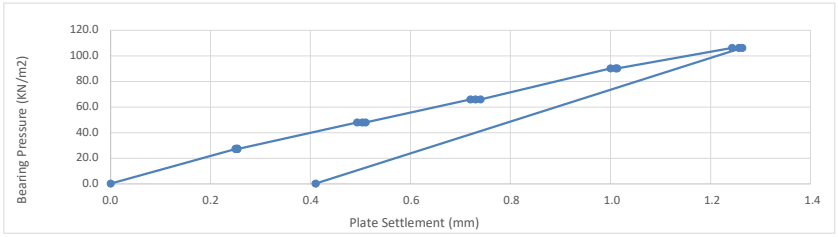
**N. Hodson**
**Materials Director**

EXPLORATION
& TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

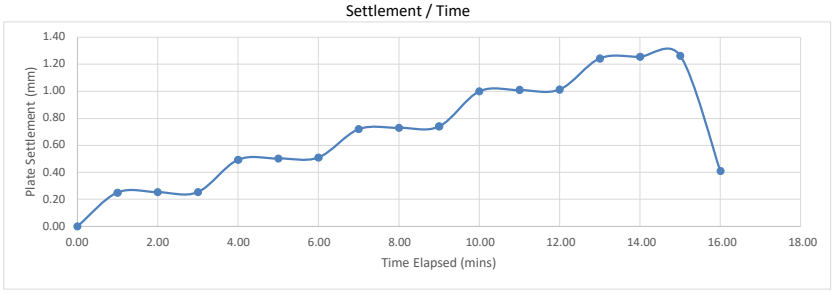
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BD |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 25/08/2022 |
| | Thistle Road | **Weather Conditions** | Overcast |
| | Littleburn Industrial Estate | **Air Temperature °C** | 17°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 1 - Zone 4 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 106 | **Maximum Deformation (mm)** | 1.26 |
| **Pressure at 1.25mm penetration (kPa)** | 106 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 73.6 |
| **Calculated CBR (%) at 1.25mm** | 9.4 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

**Unless otherwise stated, this test has been carried out in accordance with the published standard, with no deviations from the test method outlined.**

**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

Materials Director

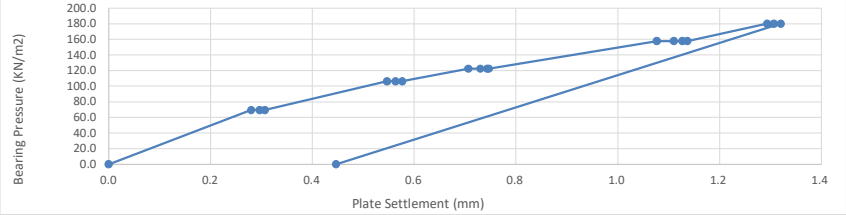
Approved Date: 25 August 2022

EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

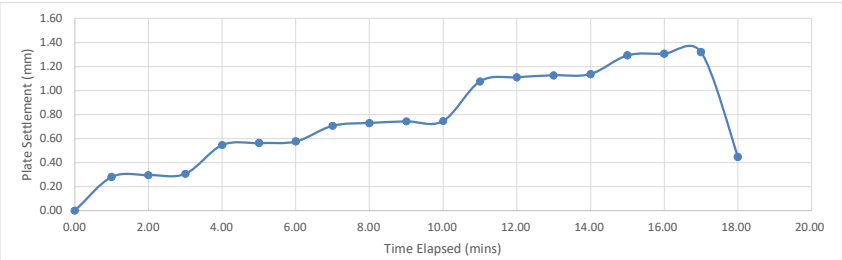
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BD |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 25/08/2022 |
| | Thistle Road | **Weather Conditions** | Overcast |
| | Littleburn Industrial Estate | **Air Temperature °C** | 17°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 2 - Zone 4 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 180 | **Maximum Deformation (mm)** | 1.32 |
| **Pressure at 1.25mm penetration (kPa)** | 174 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 127.3 |
| **Calculated CBR (%) at 1.25mm** | 22 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

**Unless otherwise stated, this test has been carried out in accordance with the published standard, with no deviations from the test method outlined.**

**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

Materials Director

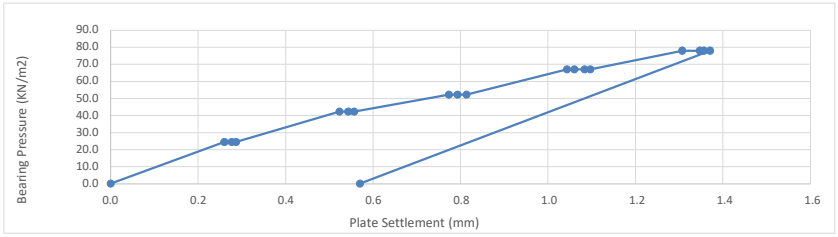
Approved Date: 26 August 2022

EXPLORATION
& TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

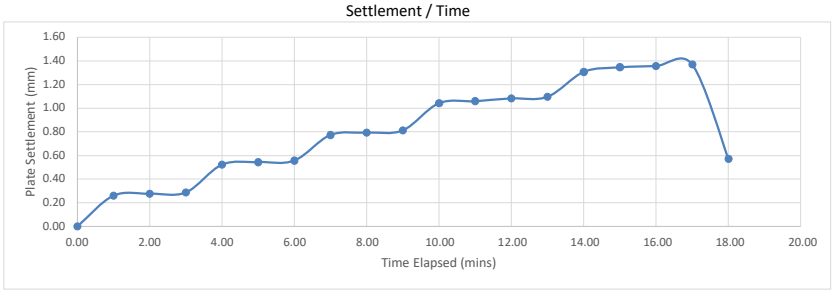
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BF |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 26/08/2022 |
| | Thistle Road | **Weather Conditions** | Sunny |
| | Littleburn Industrial Estate | **Air Temperature °C** | 20°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 1 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 78 | **Maximum Deformation (mm)** | 1.37 |
| **Pressure at 1.25mm penetration (kPa)** | 75 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 50.1 |
| **Calculated CBR (%) at 1.25mm** | 5.1 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

**Unless otherwise stated, this test has been carried out in accordance with the published standard, with no deviations from the test method outlined.**

**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

Materials Director

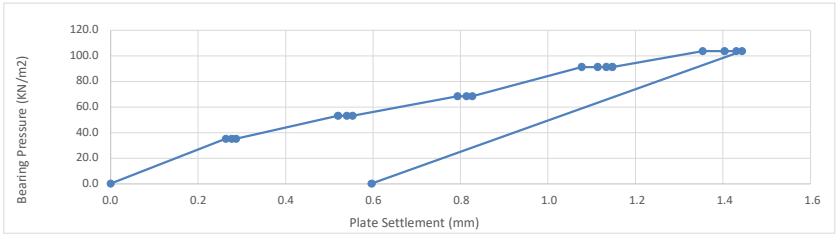
Approved Date: 30 August 2022

EXPLORATION
& TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

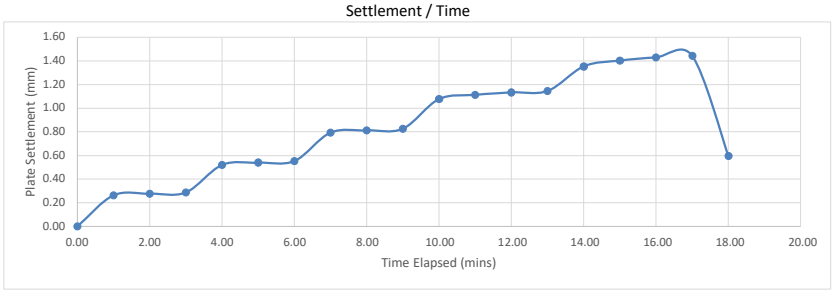
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BF |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 26/08/2022 |
| | Thistle Road | **Weather Conditions** | Sunny |
| | Littleburn Industrial Estate | **Air Temperature °C** | 20°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 2 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 104 | **Maximum Deformation (mm)** | 1.44 |
| **Pressure at 1.25mm penetration (kPa)** | 97 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 67.0 |
| **Calculated CBR (%) at 1.25mm** | 8.1 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

**Unless otherwise stated, this test has been carried out in accordance with the published standard, with no deviations from the test method outlined.**

**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

Materials Director

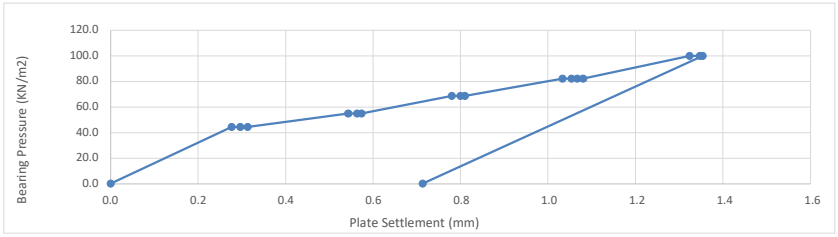
Approved Date: 30 August 2022

EXPLORATION
& TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

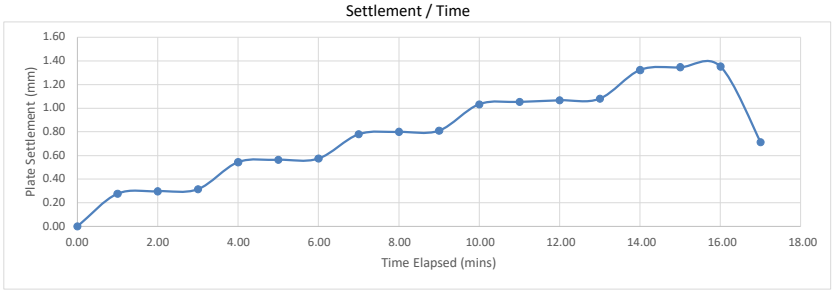
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BF |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 26/08/2022 |
| | Thistle Road | **Weather Conditions** | Sunny |
| | Littleburn Industrial Estate | **Air Temperature °C** | 20°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 3 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 100 | **Maximum Deformation (mm)** | 1.35 |
| **Pressure at 1.25mm penetration (kPa)** | 95 | **Modulus of Subgrade Reaction ($Mn/M^2/M$)** | 64.8 |
| **Calculated CBR (%) at 1.25mm** | 7.7 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

**Unless otherwise stated, this test has been carried out in accordance with the published standard, with no deviations from the test method outlined.**

**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

Materials Director

Approved Date: 30 August 2022

EXPLORATION
& TESTING ASSOCIATES

Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD T: 0191 389 6543

UKAS TESTING

**Test Report**

| | |
|---|---|
| **Client** | Groundwork Services (Durham) Limited |
| **Address** | Littleburn Industrial Estate<br>Langley Moor<br>Durham<br>DH7 8HJ |
| **F.A.O** | Paul Barton |
| **Project:** | Giga One Factory, Washington |
| **Project Number:** | D10557BG |
| **Report Number:** | L22-746 |
| **Date Received:** | 30th August 2022 |

| | |
|---|---|
| **Testing Required:** | Insitu Density by Core Cutter - BS:1377-9:1990 Clause 2.3<br><br>Hand Shear Vane*<br><br>Vertical Deformation and Strength Characteristics by the Incremental Plate Load Test - BS:1377-9:1990 Clause 4.1<br><br>Determination of Equivalent CBR Value using the Plate Bearing Test - Design Manual for Roads and Bridges, Volume 7: Pavement Design and Maintenance - Foundations HD25/9 |
| **Date Started:** | 30th August 2022 |
| **Date Finished:** | 31st August 2022 |

| | |
|---|---|
| **Report Issue Date:** | 31st August 2022 |
| **Reviewed By:** |  |
| | Natalie Hodson - Materials Director |
| **Authorised By:** |  |
| | J. Curry - Quality Technician |
| **Remarks:** | (*) denotes testing is outside of UKAS Scope of Accreditation. |
| | (+) denotes subcontracted testing. |

Samples will be stored for one month after the report has been issue before being disposed of.

The published results appertain only to the specimens tested.

EXPLORATION & TESTING ASSOCIATES

# Summary of in-situ density test results

| Project No. | Project Name |
|---|---|
| D10557BG | Giga One, Washington |

| Test Position Reference | Test reference | Depth to top m | Date of test | Soil Description | Site conditions during test | Test Type see below | In-situ Bulk Density $Mg/m^3$ | Moisture Content % | In-situ Dry Density $Mg/m^3$ | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Z8-L2_CC559_433414/558711 | CC1 | | 30/08/22 | Clay | Sunny | CCD | 2.05 | 18 | 1.73 | |
| Z8-L2_CC560_433429/558722 | CC2 | | 30/08/22 | Clay | Sunny | CCD | 2.00 | 16 | 1.73 | |
| Z8-L2_CC561_433440/558725 | CC3 | | 30/08/22 | Clay | Sunny | CCD | 1.94 | 18 | 1.64 | |
| Z8-L2_CC562_433454/558729 | CC4 | | 30/08/22 | Clay | Sunny | CCD | 2.00 | 18 | 1.70 | |
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Specifications

BS 1377 : Part 2 : 1990 Clause 3 Moisture content by oven drying method
BS 1377 : Part 9 : 1990 : In situ density tests, clauses :
SRDS 2.1 Sand replacement method ( Small pouring cylinder )
SRDL 2.2 Sand replacement method ( Large pouring cylinder )
CCD 2.4 Core cutter method

Approved By

Date
31/08/2022

N Hodson
Materials Director

UKAS Accredited Laboratory
No. 20632

EXPLORATION & TESTING ASSOCIATES

# Summary of in-situ density test results

| Project No. | Project Name |
|---|---|
| D10557BG | Giga One, Washington |

| Test Position Reference | Test reference | Depth to top m | Date of test | Soil Description | Site conditions during test | Test Type see below | In-situ Bulk Density $Mg/m^3$ | Moisture Content % | In-situ Dry Density $Mg/m^3$ | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| CC503-RT | CC5 | | 30/08/22 | Clay | Sunny | CCD | 1.99 | 21 | 1.64 | |
| CC511-RT | CC6 | | 30/08/22 | Clay | Sunny | CCD | 2.11 | 20 | 1.76 | |
| CC513-RT | CC7 | | 30/08/22 | Clay | Sunny | CCD | 2.13 | 20 | 1.78 | |
| CC518-RT | CC8 | | 30/08/22 | Clay | Sunny | CCD | 2.13 | 20 | 1.77 | |
| CC521-RT | CC9 | | 30/08/22 | Clay | Sunny | CCD | 2.07 | 21 | 1.71 | |
| | | | | | | | | | | |
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Specifications

BS 1377 : Part 2 : 1990 Clause 3 Moisture content by oven drying method
BS 1377 : Part 9 : 1990 : In situ density tests, clauses :
SRDS 2.1 Sand replacement method ( Small pouring cylinder )
SRDL 2.2 Sand replacement method ( Large pouring cylinder )
CCD 2.4 Core cutter method

Approved By

Date
31/08/2022

N Hodson
Materials Director

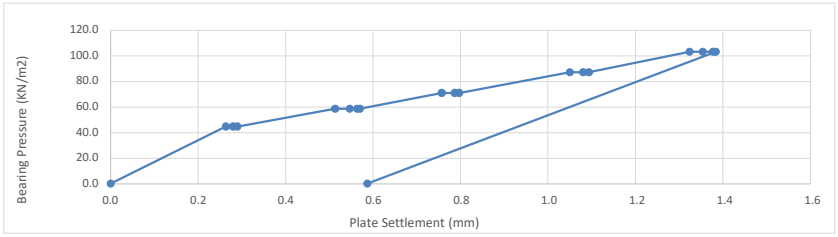
UKAS Accredited Laboratory
No. 20632

EXPLORATION
& TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

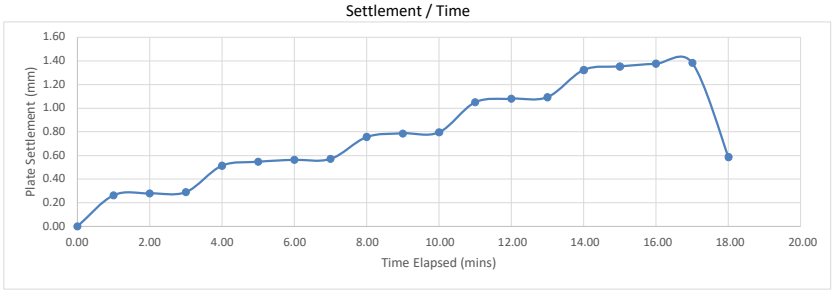
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BG |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 30/08/2022 |
| | Thistle Road | **Weather Conditions** | Sunny |
| | Littleburn Industrial Estate | **Air Temperature °C** | 19°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 1 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 103 | **Maximum Deformation (mm)** | 1.38 |
| **Pressure at 1.25mm penetration (kPa)** | 98 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 67.4 |
| **Calculated CBR (%) at 1.25mm** | 8.2 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

**Unless otherwise stated, this test has been carried out in accordance with the published standard, with no deviations from the test method outlined.**

**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

Materials Director

Approved Date: 31 August 2022

**TEST CERTIFICATE**
**Determination of the Shear Strength Using the Laboratory Handvane**

**Client:** Groundwork Services (Durham) Ltd

**Project No:** D10557BG

**Project:** Envision, Washington

**Date Tested:** 30th August 2022

**Sampled By:** D. Rutter for ETA

**Ambient Temperature*: 20***°C

**Weather Conditions*:*** *Sunny*

**Vane Used:** Small

**Comments:**

| | Z8-L2 | Z8-L2 | Z8-L2 | Z8-L2 | Z4-L2 |
|---|---|---|---|---|---|
| Client Reference | CC1 | CC2 | CC3 | CC4 | CC5 |
| Reading 1 | 12.0 | 11.8 | 9.3 | 11.0 | 12.0 |
| Reading 2 | 11.0 | 12.0 | 10.8 | 12.0 | 11.5 |
| Reading 3 | 12.0 | 10.5 | 11.1 | 12.0 | 10.8 |
| Average Readings: | 11.6 | 11.4 | 10.4 | 11.6 | 11.4 |
| Equivalent Shear Stress (kN/m2) | 233 | 229 | 208 | 233 | 229 |
| | Z8-L2 | Z8-L2 | Z8-L2 | Z8-L2 | |
| Client Reference | CC6 | CC7 | CC8 | CC9 | |
| Reading 1 | 11.5 | 12.0 | 11.3 | 12.0 | |
| Reading 2 | 11.3 | 10.5 | 12.0 | 12.0 | |
| Reading 3 | 12.0 | 12.0 | 10.8 | 10.4 | |
| Average Readings: | 11.6 | 11.5 | 11.3 | 11.4 | |
| Equivalent Shear Stress (kN/m2) | 232 | 230 | 227 | 229 | |

**Approved By:** 

**Date: 31st August 2022**

**N. Hodson**
**Materials Director**



Exploration and Testing Associates Limited, Unit 8B Bowburn South Industrial Estate, Durham, DH6 5AD

EXPLORATION
& TESTING ASSOCIATES

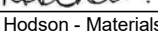
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD T: 0191 389 6543

UKAS TESTING

**Test Report**

| | |
|---|---|
| **Client** | Groundwork Services (Durham) Limited |
| **Address** | Littleburn Industrial Estate<br>Langley Moor<br>Durham<br>DH7 8HJ |
| **F.A.O** | Paul Barton |
| **Project:** | Giga One Factory, Washington |
| **Project Number:** | D10557BI |
| **Report Number:** | L22-755 |
| **Date Received:** | 1st September 2022 |

| | |
|---|---|
| **Testing Required:** | Insitu Density by Core Cutter - BS:1377-9:1990 Clause 2.3<br><br>Hand Shear Vane*<br><br>Vertical Deformation and Strength Characteristics by the Incremental Plate Load Test - BS:1377-9:1990 Clause 4.1<br><br>Determination of Equivalent CBR Value using the Plate Bearing Test - Design Manual for Roads and Bridges, Volume 7: Pavement Design and Maintenance - Foundations HD25/9 |
| **Date Started:** | 1st September 2022 |
| **Date Finished:** | 2nd September 2022 |

| | |
|---|---|
| **Report Issue Date:** | 2nd September 2022 |
| **Reviewed By:** |  |
| | Natalie Hodson - Materials Director |
| **Authorised By:** |  |
| | J. Curry - Quality Technician |
| **Remarks:** | (*) denotes testing is outside of UKAS Scope of Accreditation. |
| | (+) denotes subcontracted testing. |

Samples will be stored for one month after the report has been issue before being disposed of.

The published results appertain only to the specimens tested.

EXPLORATION & TESTING ASSOCIATES

# Summary of in-situ density test results

| Project No. | Project Name |
|---|---|
| D10557BI | Giga One, Envision, Washington |

| Test Position Reference | Test reference | Test No. | Depth to top m | Date of test | Soil Description | Site conditions during test | Test Type see below | In-situ Bulk Density $Mg/m^3$ | Moisture Content % | In-situ Dry Density $Mg/m^3$ | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E433437_N558696_Z8-L1 | CC572 | CC572 | | 01/09/22 | Clay | Cloudy | CCD | 2.11 | 14 | 1.86 | |
| E433461_N558676_Z8-L1 | CC573 | CC573 | | 09/05/00 | Clay | Cloudy | CCD | 2.02 | 15 | 1.75 | |
| E433471_N558670_Z8-L1 | CC574 | CC574 | | 01/09/22 | Clay | Cloudy | CCD | 2.12 | 16 | 1.82 | |
| E433471_N558706_Z8-L1 | CC575 | CC575 | | 01/09/22 | Clay | Cloudy | CCD | 2.11 | 21 | 1.75 | |
| E433479_N558690_Z8-L1 | CC576 | CC576 | | 01/09/22 | C;lay | Cloudy | CCD | 1.99 | 19 | 1.68 | |
| E433487_N558678_Z8-L1 | CC577 | CC577 | | 01/09/22 | Clay | Cloudy | CCD | 2.03 | 18 | 1.73 | |
| E433484_N558712_Z8-L1 | CC578 | CC578 | | 01/09/22 | Clay | Cloudy | CCD | 1.95 | 14 | 1.72 | |
| E433487_N558700_Z8-L1 | CC579 | CC579 | | 01/09/22 | Clay | Cloudy | CCD | 1.94 | 18 | 1.64 | |
| E433497_N558688_Z8-L1 | CC580 | CC580 | | 01/09/22 | Clay | Cloudy | CCD | 2.06 | 19 | 1.73 | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

Specifications

BS 1377 : Part 2 : 1990 Clause 3 Moisture content by oven drying method
BS 1377 : Part 9 : 1990 : In situ density tests, clauses :
SRDS 2.1 Sand replacement method ( Small pouring cylinder )
SRDL 2.2 Sand replacement method ( Large pouring cylinder )
CCD 2.4 Core cutter method

Approved By

Date
02/09/2022

N O'Brien

Laboratory Manager

UKAS Accredited
Laboratory No. 20632

**TEST CERTIFICATE**
**Determination of the Shear Strength Using the Laboratory Handvane**

**Client:** Groundwork Services (Durham) Ltd

**Project No:** D10557BI

**Project:** Envision, Washington

**Date Tested:** 1st September 2022

**Sampled By:** D. Rutter for ETA

**Ambient Temperature:** ***16***°C

**Weather Conditions:** *Sunny*

**Vane Used:** Small

**Comments:**

| | Z8-L1 | Z8-L1 | Z8-L1 | Z8-L1 | Z4-L1 |
|---|---|---|---|---|---|
| Client Reference | CC1 | CC2 | CC3 | CC4 | CC5 |
| Reading 1 | 11.0 | 9.0 | 12.0 | 10.0 | 12.0 |
| Reading 2 | 12.0 | 11.8 | 8.8 | 10.9 | 12.0 |
| Reading 3 | 12.0 | 12.0 | 12.0 | 12.0 | 10.6 |
| Average Readings: | 11.6 | 10.9 | 10.9 | 10.9 | 11.5 |
| Equivalent Shear Stress (kN/m2) | **233** | **219** | **217** | **219** | **231** |
| | Z8-L1 | Z8-L1 | Z8-L1 | Z8-L1 | |
| Client Reference | CC6 | CC7 | CC8 | CC9 | |
| Reading 1 | 12.0 | 12.0 | 10.9 | 11.0 | |
| Reading 2 | 12.0 | 12.0 | 12.0 | 11.8 | |
| Reading 3 | 10.6 | 11.3 | 12.0 | 10.3 | |
| Average Readings: | 11.5 | 11.7 | 11.6 | 11.0 | |
| Equivalent Shear Stress (kN/m2) | **231** | **235** | **233** | **221** | |

**Approved By:**

**J. Curry**
**Quality Technician**

**Date: 1st September 2022**



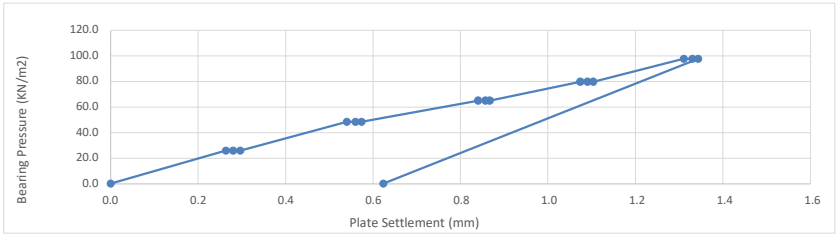
Exploration and Testing Associates Limited, Unit 8B Bowburn South Industrial Estate, Durham, DH6 5AD

EXPLORATION
& TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

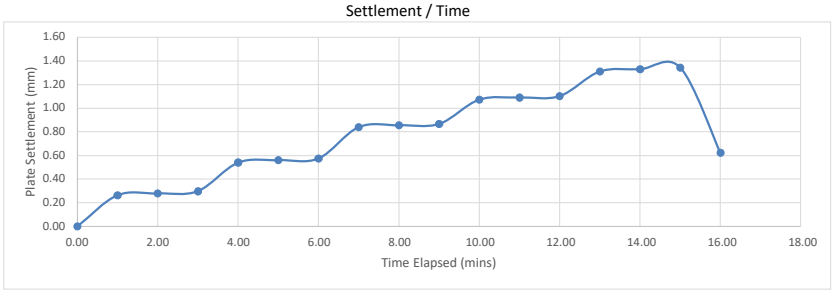
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BI |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 01/09/2022 |
| | Thistle Road | **Weather Conditions** | Sunny |
| | Littleburn Industrial Estate | **Air Temperature °C** | 19°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 1 - Zone 8 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 98 | **Maximum Deformation (mm)** | 1.34 |
| **Pressure at 1.25mm penetration (kPa)** | 92 | **Modulus of Subgrade Reaction ($Mn/M^2/M$)** | 63.1 |
| **Calculated CBR (%) at 1.25mm** | 7.4 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

**Unless otherwise stated, this test has been carried out in accordance with the published standard, with no deviations from the test method outlined.**

**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

Materials Director

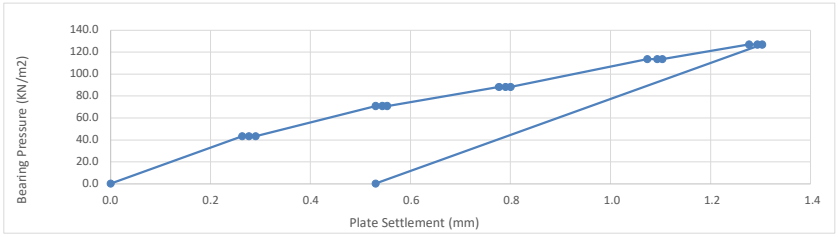
Approved Date: 02 September 2022

EXPLORATION
& TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

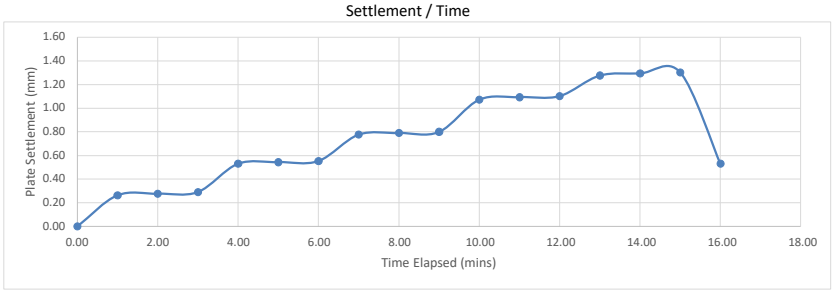
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BI |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 01/09/2022 |
| | Thistle Road | **Weather Conditions** | Sunny |
| | Littleburn Industrial Estate | **Air Temperature °C** | 19°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 2 - Zone 8 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 127 | **Maximum Deformation (mm)** | 1.30 |
| **Pressure at 1.25mm penetration (kPa)** | 125 | **Modulus of Subgrade Reaction ($Mn/M^2/M$)** | 88.1 |
| **Calculated CBR (%) at 1.25mm** | 12 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

**Unless otherwise stated, this test has been carried out in accordance with the published standard, with no deviations from the test method outlined.**

**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

Materials Director

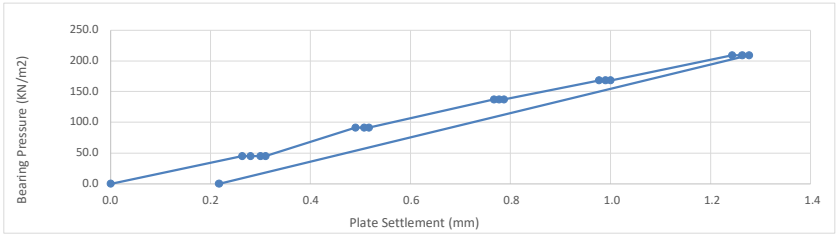
Approved Date: 02 September 2022

EXPLORATION
& TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

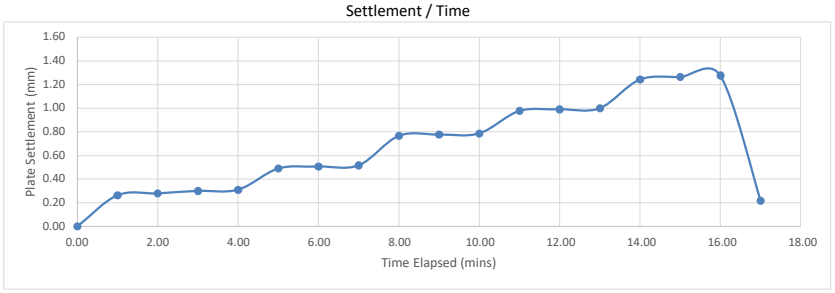
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BI |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 01/09/2022 |
| | Thistle Road | **Weather Conditions** | Sunny |
| | Littleburn Industrial Estate | **Air Temperature °C** | 19°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 3 - Zone 8 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 209 | **Maximum Deformation (mm)** | 1.28 |
| **Pressure at 1.25mm penetration (kPa)** | 209 | **Modulus of Subgrade Reaction ($Mn/M^2/M$)** | 156.2 |
| **Calculated CBR (%) at 1.25mm** | 30.3 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

**Unless otherwise stated, this test has been carried out in accordance with the published standard, with no deviations from the test method outlined.**

**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

Materials Director

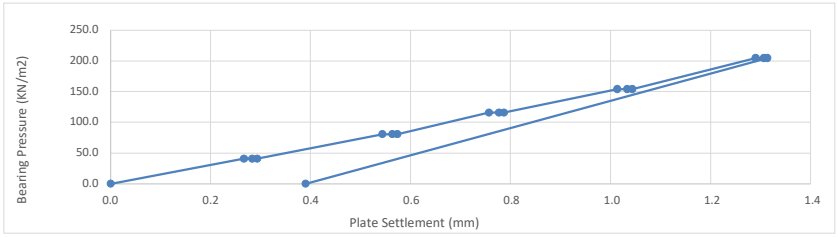
Approved Date: 02 September 2022

EXPLORATION
& TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

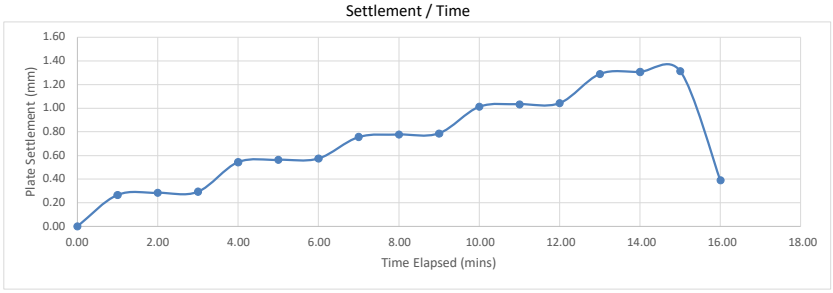
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BI |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 01/09/2022 |
| | Thistle Road | **Weather Conditions** | Sunny |
| | Littleburn Industrial Estate | **Air Temperature °C** | 19°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 4 - Zone 8 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 205 | **Maximum Deformation (mm)** | 1.31 |
| **Pressure at 1.25mm penetration (kPa)** | 196 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 145.8 |
| **Calculated CBR (%) at 1.25mm** | 27 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

**Unless otherwise stated, this test has been carried out in accordance with the published standard, with no deviations from the test method outlined.**

**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

Materials Director

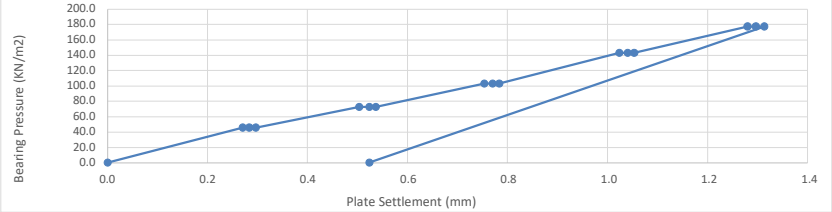
Approved Date: 02 September 2022

EXPLORATION
& TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

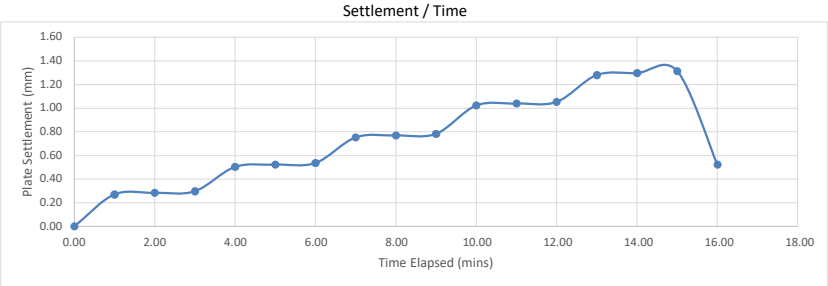
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BI |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 01/09/2022 |
| | Thistle Road | **Weather Conditions** | Sunny |
| | Littleburn Industrial Estate | **Air Temperature °C** | 19°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 5 - Zone 8 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 177 | **Maximum Deformation (mm)** | 1.31 |
| **Pressure at 1.25mm penetration (kPa)** | 173 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 126.4 |
| **Calculated CBR (%) at 1.25mm** | 22 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

**Unless otherwise stated, this test has been carried out in accordance with the published standard, with no deviations from the test method outlined.**

**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

Materials Director

Approved Date: 02 September 2022

EXPLORATION
& TESTING ASSOCIATES

Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD T: 0191 389 6543

UKAS TESTING

**Test Report**

| | |
|---|---|
| **Client** | Groundwork Services (Durham) Limited |
| **Address** | Littleburn Industrial Estate<br>Langley Moor<br>Durham<br>DH7 8HJ |
| **F.A.O** | Paul Barton |
| **Project:** | Giga One Factory, Washington |
| **Project Number:** | D10557BJ |
| **Report Number:** | L22-773 |
| **Date Received:** | 2nd September 2022 |

| | |
|---|---|
| **Testing Required:** | Insitu Density by Core Cutter - BS:1377-9:1990 Clause 2.3<br><br>Hand Shear Vane*<br><br>Vertical Deformation and Strength Characteristics by the Incremental Plate Load Test - BS:1377-9:1990 Clause 4.1<br><br>Determination of Equivalent CBR Value using the Plate Bearing Test - Design Manual for Roads and Bridges, Volume 7: Pavement Design and Maintenance - Foundations HD25/9 |
| **Date Started:** | 2nd September 2022 |
| **Date Finished:** | 5th September 2022 |

| | |
|---|---|
| **Report Issue Date:** | 5th September 2022 |
| **Reviewed By:** | N. Obrien - Labratory Manager |
| **Authorised By:** | J. Curry - Quality Technician |
| **Remarks:** | (*) denotes testing is outside of UKAS Scope of Accreditation.<br>(+) denotes subcontracted testing. |

Samples will be stored for one month after the report has been issue before being disposed of.

The published results appertain only to the specimens tested.

EXPLORATION & TESTING ASSOCIATES

# Summary of in-situ density test results

| Project No. | Project Name |
|---|---|
| D10557BJ | Giga One, Envision, Washington |

| Test Position Reference | Test reference | Depth to top m | Date of test | Soil Description | Site conditions during test | Test Type see below | In-situ Bulk Density $Mg/m^3$ | Moisture Content % | In-situ Dry Density $Mg/m^3$ | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| E433257_N558971_Z4-L1 | CC581 | | 02/09/22 | Clay | Sunny | CCD | 2.01 | 22 | 1.65 | |
| E433294_N558986_Z4-L1 | CC582 | | 02/09/22 | Clay | Sunny | CCD | 2.11 | 20 | 1.77 | |
| E433285_N558980_Z4-L1 | CC583 | | 02/09/22 | Clay | Sunny | CCD | 1.97 | 20 | 1.64 | |
| E433271_N558976_Z4-L1 | CC584 | | 02/09/22 | Clay | Sunny | CCD | 2.05 | 19 | 1.72 | |
| E433290_N558990_Z4-L1 | CC585 | | 02/09/22 | Clay | Sunny | CCD | 2.04 | 21 | 1.69 | |
| E433279_N558985_Z4-L1 | CC586 | | 02/09/22 | Clay | Sunny | CCD | 2.06 | 18 | 1.75 | |
| E433267_N558980_Z4-L1 | CC587 | | 02/09/22 | Clay | Sunny | CCD | 1.99 | 19 | 1.67 | |
| E433255_N558977_Z4-L1 | CC588 | | 02/09/22 | Clay | Sunny | CCD | 1.99 | 23 | 1.62 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Specifications

BS 1377 : Part 2 : 1990 Clause 3 Moisture content by oven drying method

BS 1377 : Part 9 : 1990 : In situ density tests, clauses :

SRDS 2.1 Sand replacement method ( Small pouring cylinder )

SRDL 2.2 Sand replacement method ( Large pouring cylinder )

CCD 2.4 Core cutter method



Approved By

Date

05/09/2022

N O'Brien

Laboratory Manager

UKAS Accredited Laboratory No. 20632

**TEST CERTIFICATE**
**Determination of the Shear Strength Using the Laboratory Handvane**

**Client:** Groundwork Services (Durham) Ltd

**Project No:** D10557BJ

**Project:** Envision, Washington

**Date Tested:** 2nd September 2022

**Sampled By:** D. Rutter for ETA

**Ambient Temperature*: 20***°C

**Weather Conditions*:*** *Sunny*

**Vane Used:** Small

**Comments:**

| | Z4-L1 | Z4-L1 | Z4-L1 | Z4-L1 | Z4-L1 |
|---|---|---|---|---|---|
| Client Reference | CC1 | CC2 | CC3 | CC4 | CC5 |
| Reading 1 | 12.0 | 11.6 | 12.0 | 10.5 | 12.0 |
| Reading 2 | 10.8 | 12.0 | 9.8 | 12.0 | 10.8 |
| Reading 3 | 11.1 | 12.0 | 12.0 | 11.0 | 11.8 |
| Average Readings: | 11.2 | 11.8 | 11.2 | 11.1 | 11.5 |
| Equivalent Shear Stress (kN/m2) | **225** | **237** | **225** | **223** | **231** |
| | **Z4-L1** | **Z4-L1** | **Z4-L1** | | |
| Client Reference | CC6 | CC7 | CC8 | | |
| Reading 1 | 9.1 | 12.0 | 10.1 | | |
| Reading 2 | 10.4 | 9.4 | 12.0 | | |
| Reading 3 | 12.0 | 8.9 | 12.0 | | |
| Average Readings: | 10.5 | 10.1 | 11.3 | | |
| Equivalent Shear Stress (kN/m2) | **210** | **202** | **227** | | |

**Approved By:**

**N. Obrien**
**Laboratory Manager**

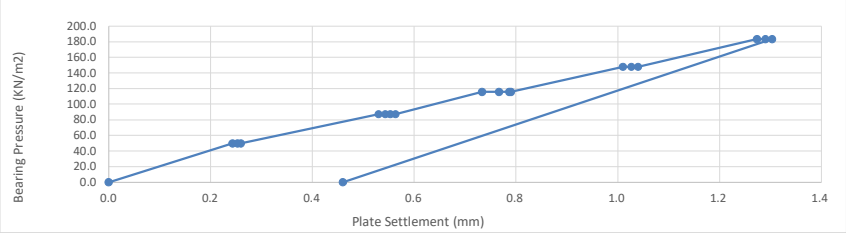
**Date: 5th September 2022**

EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

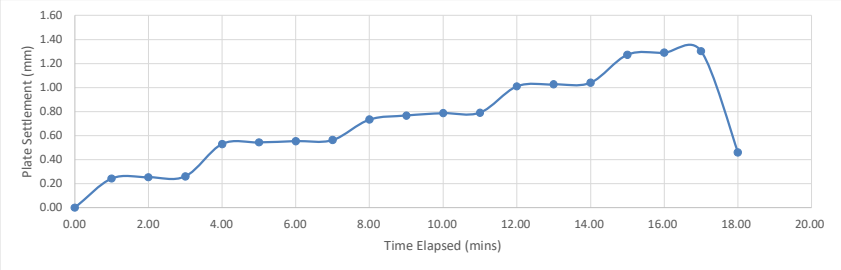
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BJ |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 02/09/2022 |
| | Thistle Road | **Weather Conditions** | Sunny |
| | Littleburn Industrial Estate | **Air Temperature °C** | 20°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 1 - Zone 8 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 183 | **Maximum Deformation (mm)** | 1.30 |
| **Pressure at 1.25mm penetration (kPa)** | 180 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 132.1 |
| **Calculated CBR (%) at 1.25mm** | 23.3 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

**Unless otherwise stated, this test has been carried out in accordance with the published standard, with no deviations from the test method outlined.**

**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

Laboratory Manager

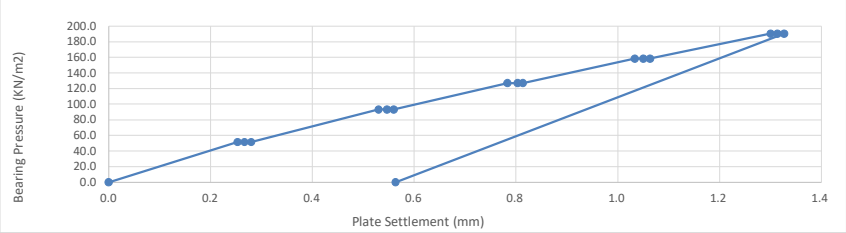
Approved Date: 05 September 2022

EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

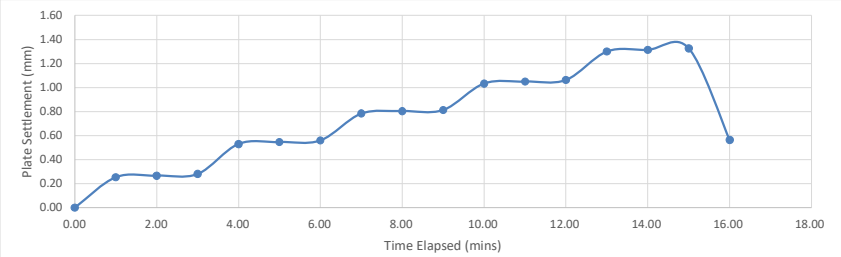
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BJ |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 02/09/2022 |
| | Thistle Road | **Weather Conditions** | Sunny |
| | Littleburn Industrial Estate | **Air Temperature °C** | 20°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 2 - Zone 8 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 190 | **Maximum Deformation (mm)** | 1.33 |
| **Pressure at 1.25mm penetration (kPa)** | 184 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 135.2 |
| **Calculated CBR (%) at 1.25mm** | 24.2 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

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**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

Laboratory Manager

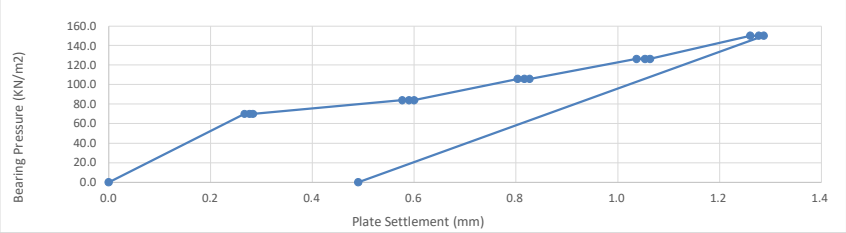
Approved Date: 05 September 2022

EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

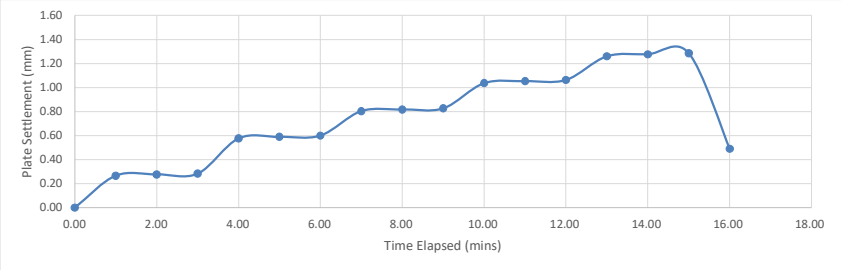
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BJ |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 02/09/2022 |
| | Thistle Road | **Weather Conditions** | Sunny |
| | Littleburn Industrial Estate | **Air Temperature °C** | 20°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 3 - Zone 8 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 150 | **Maximum Deformation (mm)** | 1.29 |
| **Pressure at 1.25mm penetration (kPa)** | 149 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 107.2 |
| **Calculated CBR (%) at 1.25mm** | 17 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

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**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

Laboratory Manager

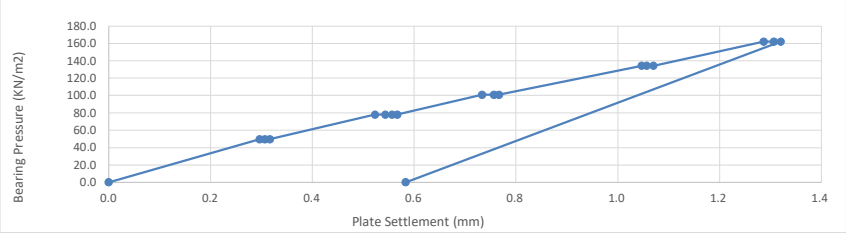
Approved Date: 05 September 2022

EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

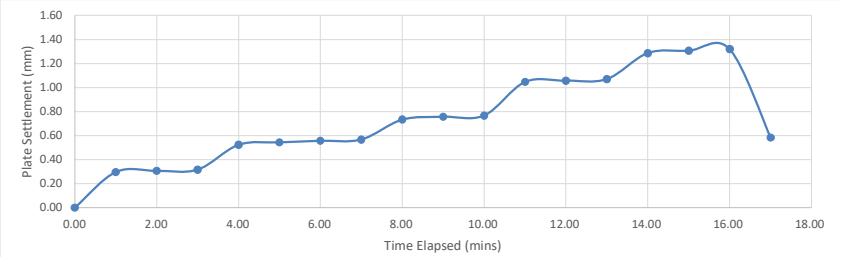
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BJ |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 02/09/2022 |
| | Thistle Road | **Weather Conditions** | Sunny |
| | Littleburn Industrial Estate | **Air Temperature °C** | 20°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 4 - Zone 8 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 162 | **Maximum Deformation (mm)** | 1.32 |
| **Pressure at 1.25mm penetration (kPa)** | 157 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 114.0 |
| **Calculated CBR (%) at 1.25mm** | 19 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

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**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

Laboratory Manager

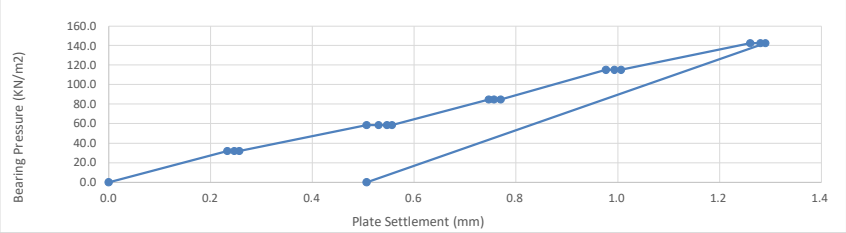
Approved Date: 05 September 2022

EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

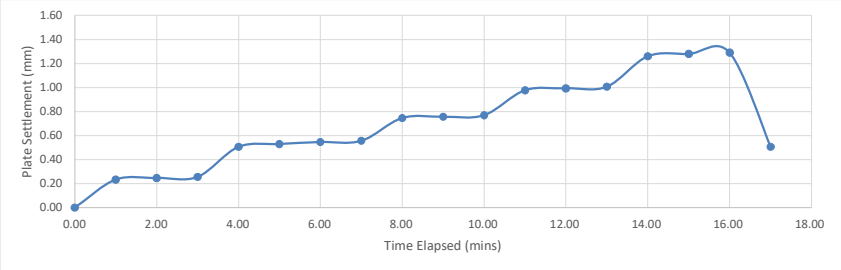
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BJ |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 02/09/2022 |
| | Thistle Road | **Weather Conditions** | Sunny |
| | Littleburn Industrial Estate | **Air Temperature °C** | 20°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 5 - Zone 8 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 143 | **Maximum Deformation (mm)** | 1.29 |
| **Pressure at 1.25mm penetration (kPa)** | 142 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 101.3 |
| **Calculated CBR (%) at 1.25mm** | 15 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

**Unless otherwise stated, this test has been carried out in accordance with the published standard, with no deviations from the test method outlined.**

**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

Laboratory Manager

Approved Date: 05 September 2022

EXPLORATION
& TESTING ASSOCIATES

Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD T: 0191 389 6543

UKAS TESTING

**Test Report**

| | |
|---|---|
| **Client** | Groundwork Services (Durham) Limited |
| **Address** | Littleburn Industrial Estate<br>Langley Moor<br>Durham<br>DH7 8HJ |
| **F.A.O** | Paul Barton |
| **Project:** | Giga One Factory, Washington |
| **Project Number:** | D10557BJ |
| **Report Number:** | L22-773 |
| **Date Received:** | 2nd September 2022 |

| | |
|---|---|
| **Testing Required:** | Insitu Density by Core Cutter - BS:1377-9:1990 Clause 2.3<br><br>Hand Shear Vane*<br><br>Vertical Deformation and Strength Characteristics by the Incremental Plate Load Test - BS:1377-9:1990 Clause 4.1<br><br>Determination of Equivalent CBR Value using the Plate Bearing Test - Design Manual for Roads and Bridges, Volume 7: Pavement Design and Maintenance - Foundations HD25/9 |
| **Date Started:** | 2nd September 2022 |
| **Date Finished:** | 5th September 2022 |

| | |
|---|---|
| **Report Issue Date:** | 5th September 2022 |
| **Reviewed By:** | N. Obrien - Labratory Manager |
| **Authorised By:** | J. Curry - Quality Technician |
| **Remarks:** | (*) denotes testing is outside of UKAS Scope of Accreditation.<br>(+) denotes subcontracted testing. |

Samples will be stored for one month after the report has been issue before being disposed of.

The published results appertain only to the specimens tested.

EXPLORATION & TESTING ASSOCIATES

# Summary of in-situ density test results

| Project No. | Project Name |
|---|---|
| D10557BK | Giga One, Envision, Washington |

| Test Position Reference | Test reference | Depth to top m | Date of test | Soil Description | Site conditions during test | Test Type see below | In-situ Bulk Density Mg/m$^3$ | Moisture Content % | In-situ Dry Density Mg/m$^3$ | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| E433302_N558994_Z4-L2 | CC589 | | 05/09/22 | Clay | Sunny | CCD | 1.91 | 16 | 1.65 | |
| E433291_N558985_Z4-L2 | CC590 | | 05/09/22 | Clay | Sunny | CCD | 1.98 | 19 | 1.66 | |
| E433277_N558979_Z4-L2 | CC591 | | 05/09/22 | Clay | Sunny | CCD | 1.97 | 21 | 1.62 | |
| E433268_N558976_Z4-L2 | CC592 | | 05/09/22 | Clay | Sunny | CCD | 2.00 | 19 | 1.69 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
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| | | | | | | | | | | |

Specifications

BS 1377 : Part 2 : 1990 Clause 3 Moisture content by oven drying method
BS 1377 : Part 9 : 1990 : In situ density tests, clauses :
SRDS 2.1 Sand replacement method ( Small pouring cylinder )
SRDL 2.2 Sand replacement method ( Large pouring cylinder )
CCD 2.4 Core cutter method

Approved By

Date
06/09/2022

N O'Brien

Laboratory Manager

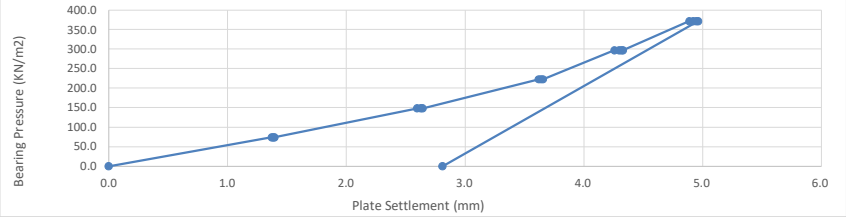
UKAS Accredited Laboratory No. 20632

EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

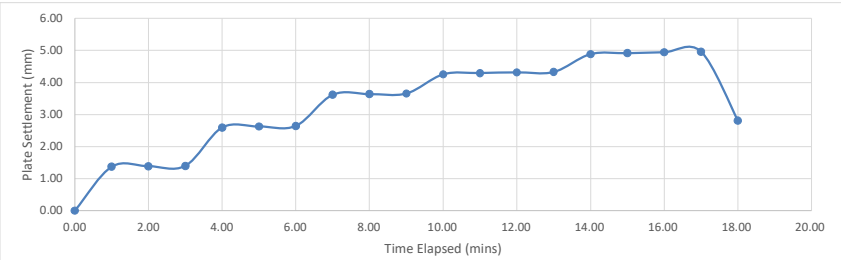
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BK |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 05/09/2022 |
| | Thistle Road | **Weather Conditions** | Sunny |
| | Littleburn Industrial Estate | **Air Temperature °C** | 20°C |
| | Langley Moor | **Sample Description** | Type 1 |
| | DH7 8HJ | **Reaction Load** | 18t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 600 | **Test Location** | CBR 1 - Main Building |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 371 | **Maximum Deformation (mm)** | 4.96 |
| **Pressure at 1.25mm penetration (kPa)** | 68 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 59.3 |
| **Calculated CBR (%) at 1.25mm** | 6.7 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

**Unless otherwise stated, this test has been carried out in accordance with the published standard, with no deviations from the test method outlined.**

**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

J. Curry

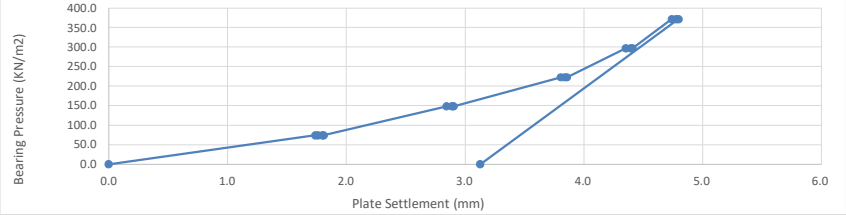
Approved Date: 06 September 2022

EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

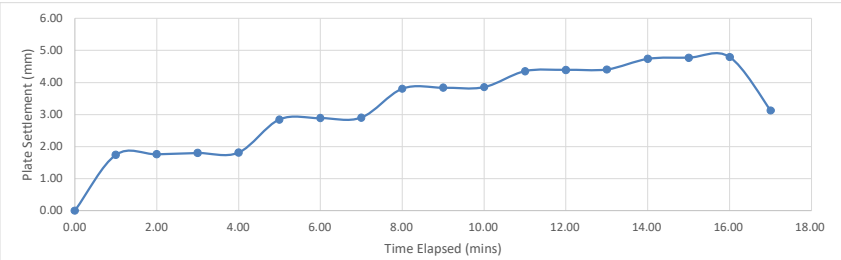
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BK |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 05/09/2022 |
| | Thistle Road | **Weather Conditions** | Sunny |
| | Littleburn Industrial Estate | **Air Temperature °C** | 20°C |
| | Langley Moor | **Sample Description** | Type 1 |
| | DH7 8HJ | **Reaction Load** | 18t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 600 | **Test Location** | CBR 2 - Main Building |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 371 | **Maximum Deformation (mm)** | 4.80 |
| **Pressure at 1.25mm penetration (kPa)** | 53 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 45.6 |
| **Calculated CBR (%) at 1.25mm** | 4.4 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

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**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

J. Curry

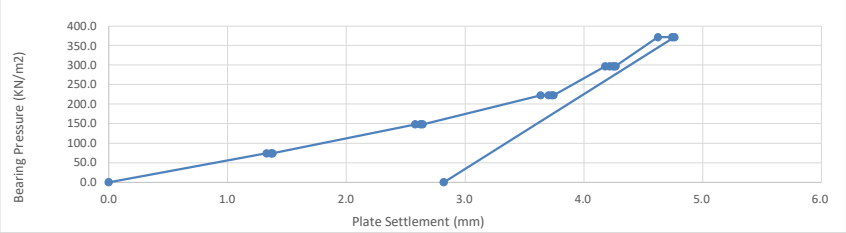
Approved Date: 06 September 2022

EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

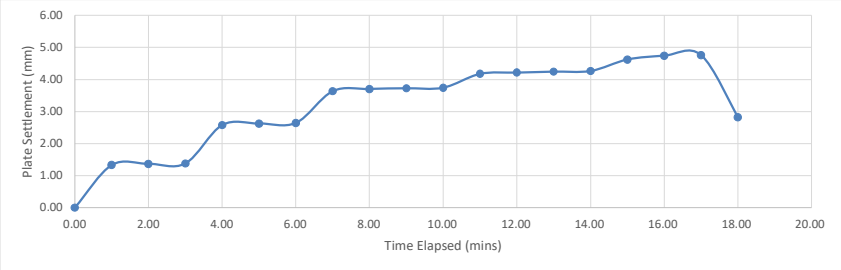
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BK |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 05/09/2022 |
| | Thistle Road | **Weather Conditions** | Sunny |
| | Littleburn Industrial Estate | **Air Temperature °C** | 20°C |
| | Langley Moor | **Sample Description** | Type 1 |
| | DH7 8HJ | **Reaction Load** | 18t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 600 | **Test Location** | CBR 3 - Main Building |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 371 | **Maximum Deformation (mm)** | 4.76 |
| **Pressure at 1.25mm penetration (kPa)** | 70 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 61.4 |
| **Calculated CBR (%) at 1.25mm** | 7.1 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

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**The published results are appertaining only to the locations tested and are correct at the time of testing.**

**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

J. Curry

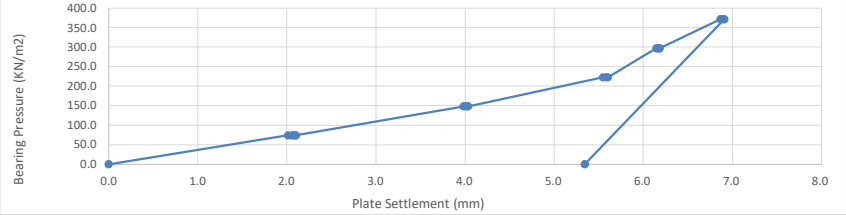
Approved Date: 06 September 2022

EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

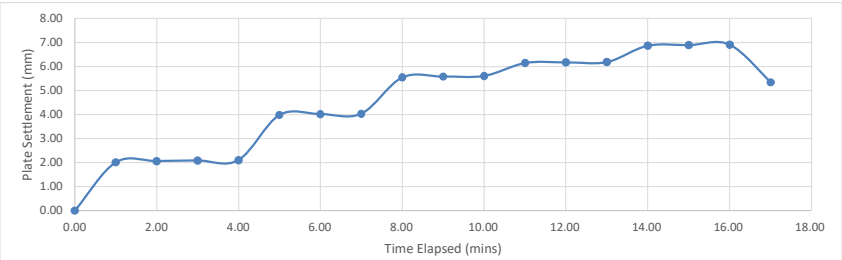
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BK |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 05/09/2022 |
| | Thistle Road | **Weather Conditions** | Sunny |
| | Littleburn Industrial Estate | **Air Temperature °C** | 20°C |
| | Langley Moor | **Sample Description** | Type 1 |
| | DH7 8HJ | **Reaction Load** | 18t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 600 | **Test Location** | CBR 4 - Main Building |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 371 | **Maximum Deformation (mm)** | 6.91 |
| **Pressure at 1.25mm penetration (kPa)** | 46 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 38.8 |
| **Calculated CBR (%) at 1.25mm** | 3.4 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

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**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

J. Curry

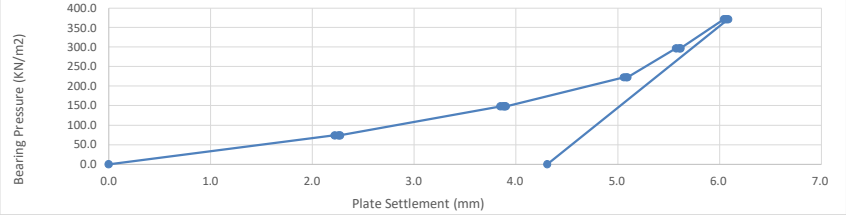
Approved Date: 06 September 2022

EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

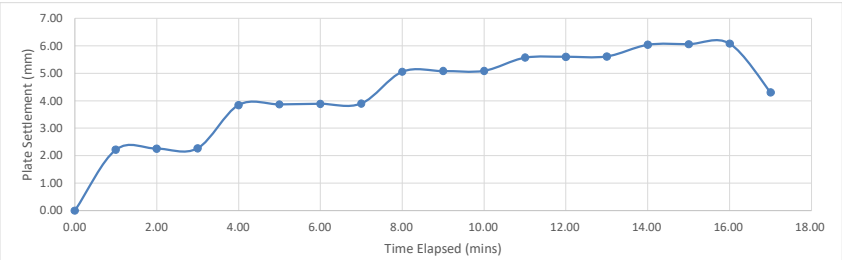
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BK |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 05/09/2022 |
| | Thistle Road | **Weather Conditions** | Sunny |
| | Littleburn Industrial Estate | **Air Temperature °C** | 20°C |
| | Langley Moor | **Sample Description** | Type 1 |
| | DH7 8HJ | **Reaction Load** | 18t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 600 | **Test Location** | CBR 5 - Main Building |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 371 | **Maximum Deformation (mm)** | 6.08 |
| **Pressure at 1.25mm penetration (kPa)** | 42 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 34.8 |
| **Calculated CBR (%) at 1.25mm** | 2.9 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

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**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

J. Curry

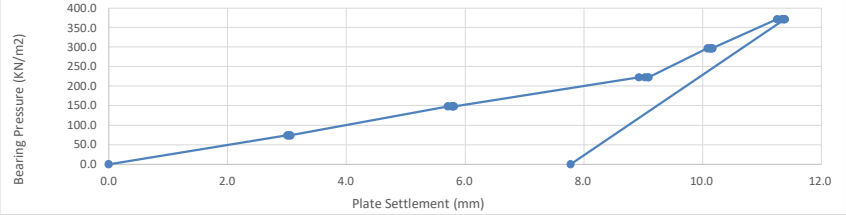
Approved Date: 06 September 2022

EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

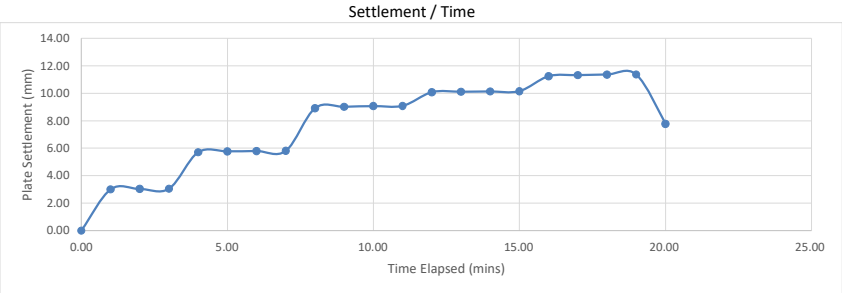
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BK |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 05/09/2022 |
| | Thistle Road | **Weather Conditions** | Sunny |
| | Littleburn Industrial Estate | **Air Temperature °C** | 20°C |
| | Langley Moor | **Sample Description** | Type 1 |
| | DH7 8HJ | **Reaction Load** | 18t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 600 | **Test Location** | CBR 6 - Main Building |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 371 | **Maximum Deformation (mm)** | 11.38 |
| **Pressure at 1.25mm penetration (kPa)** | 31 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 24.9 |
| **Calculated CBR (%) at 1.25mm** | 1.7 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

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**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

J. Curry

Approved Date: 06 September 2022

**TEST CERTIFICATE**
**Determination of the Shear Strength Using the Laboratory Handvane**

**Client:** Groundwork Services (Durham) Ltd

**Project No:** D10557BK

**Project:** Envision, Washington

**Date Tested:** 5th September 2022

**Sampled By:** D. Rutter for ETA

**Ambient Temperature*: 21***°C

**Weather Conditions*:*** *Sunny*

**Vane Used:** Small

**Comments:**

| | Z4-L2 | Z4-L2 | Z4-L2 | Z4-L2 |
|---|---|---|---|---|
| Client Reference | CC1 | CC2 | CC3 | CC4 |
| Reading 1 | 7.2 | 11.5 | 8.5 | 12.0 |
| Reading 2 | 11.4 | 12.0 | 9.7 | 10.4 |
| Reading 3 | 10.8 | 10.4 | 12.0 | 12.0 |
| Average Readings: | 9.8 | 11.3 | 10.6 | 11.4 |
| Equivalent Shear Stress (kN/m2) | **196** | **226** | **201** | **229** |

**Approved By:**

**J. Curry**
**Quality- Technician**

**Date: 6th September 2022**

EXPLORATION
& TESTING ASSOCIATES

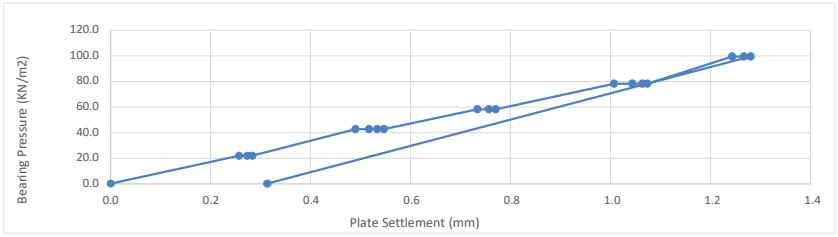
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD

Tel. (+44) 0191 389 6543

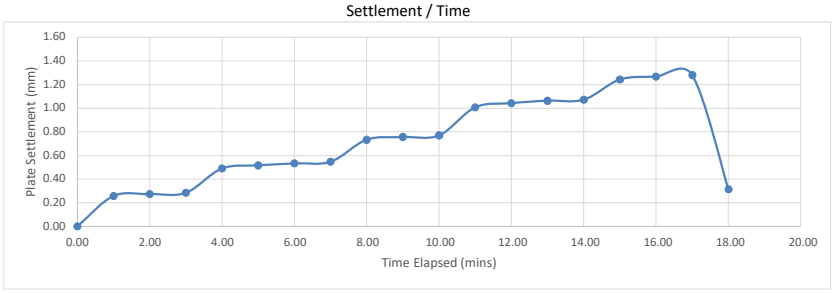
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BS |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 16/09/2022 |
| | Thistle Road | **Weather Conditions** | Clear |
| | Littleburn Industrial Estate | **Air Temperature °C** | 9°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 1 - Road |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 99 | **Maximum Deformation (mm)** | 1.28 |
| **Pressure at 1.25mm penetration (kPa)** | 99 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 68.5 |
| **Calculated CBR (%) at 1.25mm** | 8.4 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

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**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

J. Curry

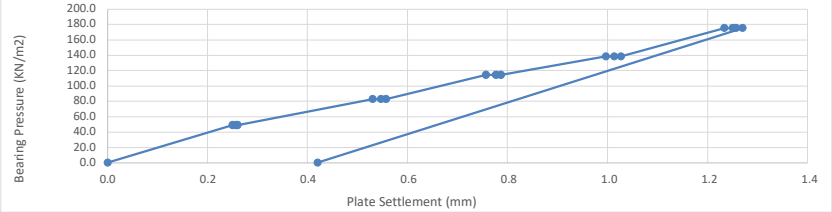
Approved Date: 19 September 2022

EXPLORATION
& TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

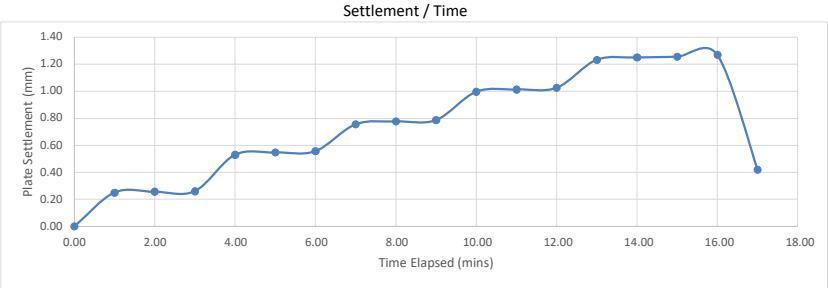
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BS |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 16/09/2022 |
| | Thistle Road | **Weather Conditions** | Clear |
| | Littleburn Industrial Estate | **Air Temperature °C** | 9°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 2 - Road |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 175 | **Maximum Deformation (mm)** | 1.27 |
| **Pressure at 1.25mm penetration (kPa)** | 175 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 128.5 |
| **Calculated CBR (%) at 1.25mm** | 22 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

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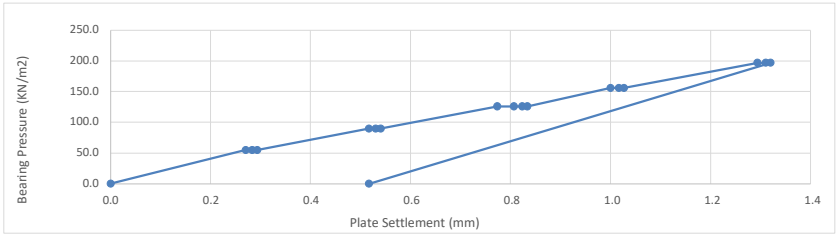
| **Test Carried Out By:** | **Approved By:** |
|---|---|
| D. Rutter | |
| Materials Technician | J. Curry |
| Approved Date: | 19 September 2022 |

EXPLORATION
& TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

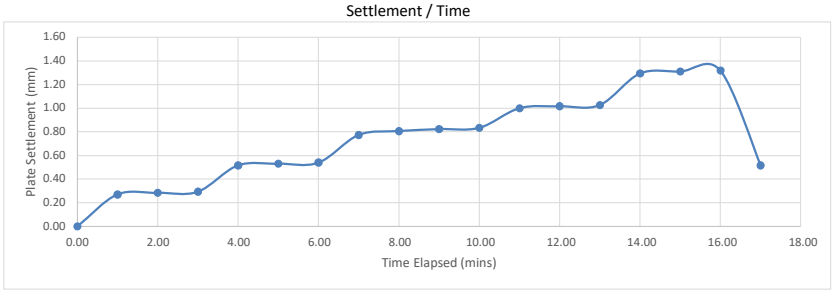
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BS |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 16/09/2022 |
| | Thistle Road | **Weather Conditions** | Clear |
| | Littleburn Industrial Estate | **Air Temperature °C** | 9°C |
| | Langley Moor | **Sample Description** | Clay |
| | DH7 8HJ | **Reaction Load** | 13t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 450 | **Test Location** | CBR 3 - Road |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 197 | **Maximum Deformation (mm)** | 1.32 |
| **Pressure at 1.25mm penetration (kPa)** | 190 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 140.7 |
| **Calculated CBR (%) at 1.25mm** | 26 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

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| **Test Carried Out By:** | **Approved By:** |
|---|---|
| D. Rutter | |
| Materials Technician | J. Curry |
| Approved Date: | 19 September 2022 |

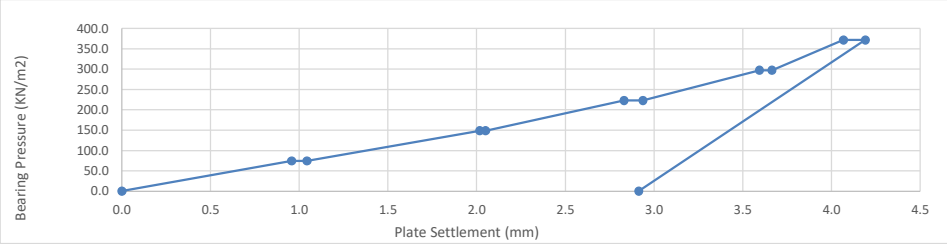
EXPLORATION
& TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

UKAS TESTING

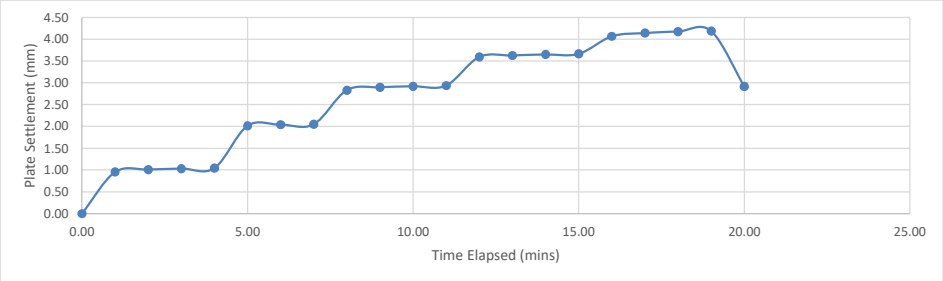
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BU |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 21/09/2022 |
| | Thistle Road | **Weather Conditions** | Clear, Dry |
| | Littleburn Industrial Estate | **Air Temperature °C** | 16°C |
| | Langley Moor | **Sample Description** | Stone |
| | DH7 8HJ | **Reaction Load** | 17t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 600 | **Test Location** | PLT1 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 371 | **Maximum Deformation (mm)** | 4.19 |
| **Pressure at 1.25mm penetration (kPa)** | 90 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 81.4 |
| **Calculated CBR (%) at 1.25mm** | 11 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

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**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

J. Curry

Approved Date: 22 September 2022

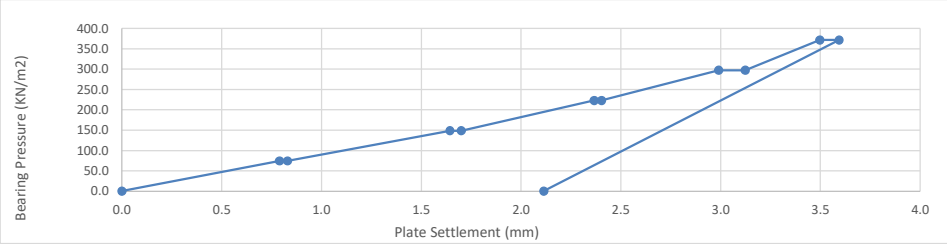
EXPLORATION
& TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

UKAS TESTING

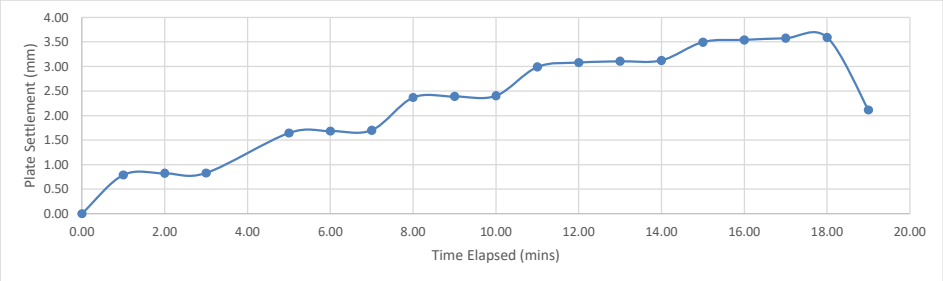
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BU |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 21/09/2022 |
| | Thistle Road | **Weather Conditions** | Sunny, Dry |
| | Littleburn Industrial Estate | **Air Temperature °C** | 16°C |
| | Langley Moor | **Sample Description** | Stone |
| | DH7 8HJ | **Reaction Load** | 17t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 600 | **Test Location** | PLT2 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 371 | **Maximum Deformation (mm)** | 3.59 |
| **Pressure at 1.25mm penetration (kPa)** | 113 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 104.3 |
| **Calculated CBR (%) at 1.25mm** | 16 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

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**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

J. Curry

Approved Date: 22 September 2022

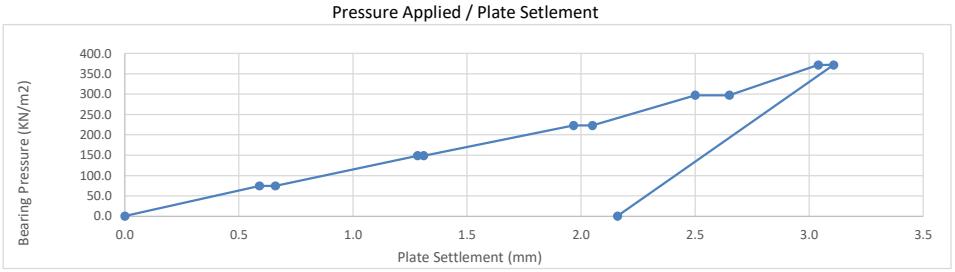
EXPLORATION
& TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

UKAS TESTING

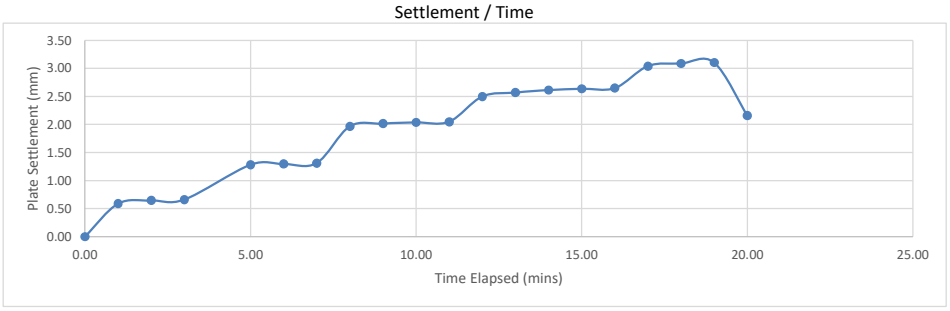
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BU |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 21/09/2022 |
| | Thistle Road | **Weather Conditions** | Sunny, Dry |
| | Littleburn Industrial Estate | **Air Temperature °C** | 16°C |
| | Langley Moor | **Sample Description** | Stone |
| | DH7 8HJ | **Reaction Load** | 17t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 600 | **Test Location** | PLT3 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 371 | **Maximum Deformation (mm)** | 3.11 |
| **Pressure at 1.25mm penetration (kPa)** | 145 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 137.7 |
| **Calculated CBR (%) at 1.25mm** | 25 | | |

In Accordance with CD225 Design for New Pavement Foundations,CBR Value has been caluclated in conjunction with superseded document IAN 73/06 Revision 1 (2009)

In Accordance with CD225 Design for New Pavement Foundations, Modulus of Subgrade Reaction has been calculated in conjunction with superseded document HD 25/94

**Comments:**

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**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

J. Curry

Approved Date: 22 September 2022

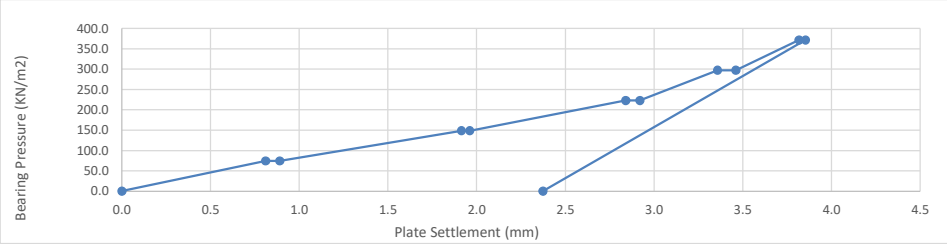
EXPLORATION
& TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

UKAS TESTING

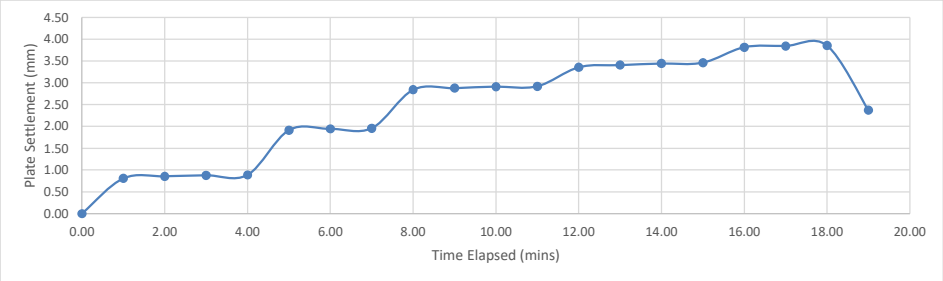
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BU |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 21/09/2022 |
| | Thistle Road | **Weather Conditions** | Sunny, Dry |
| | Littleburn Industrial Estate | **Air Temperature °C** | 16°C |
| | Langley Moor | **Sample Description** | Stone |
| | DH7 8HJ | **Reaction Load** | 17t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 600 | **Test Location** | PLT4 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 371 | **Maximum Deformation (mm)** | 3.85 |
| **Pressure at 1.25mm penetration (kPa)** | 100 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 91.8 |
| **Calculated CBR (%) at 1.25mm** | 13 | | |

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D. Rutter

Materials Technician

**Approved By:**

J. Curry

Approved Date: 22 September 2022

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& TESTING ASSOCIATES
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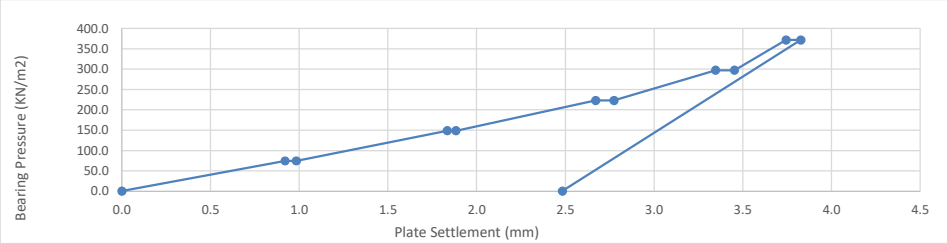
UKAS TESTING

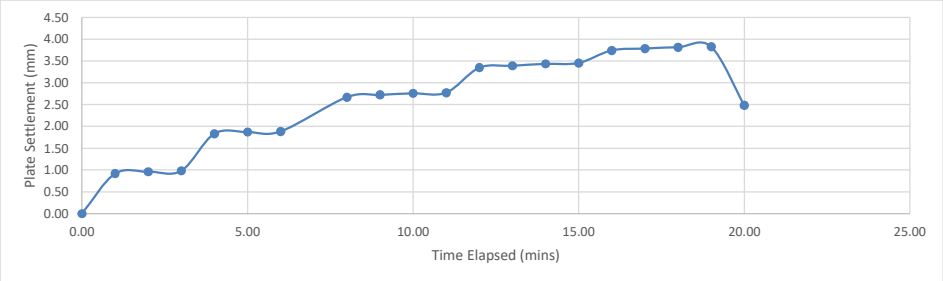
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BU |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 21/09/2022 |
| | Thistle Road | **Weather Conditions** | Sunny, Dry |
| | Littleburn Industrial Estate | **Air Temperature °C** | 16°C |
| | Langley Moor | **Sample Description** | Stone |
| | DH7 8HJ | **Reaction Load** | 17t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 600 | **Test Location** | PLT5 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 371 | **Maximum Deformation (mm)** | 3.83 |
| **Pressure at 1.25mm penetration (kPa)** | 98 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 89.0 |
| **Calculated CBR (%) at 1.25mm** | 13 | | |

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**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

J. Curry

Approved Date: 22 September 2022

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& TESTING ASSOCIATES
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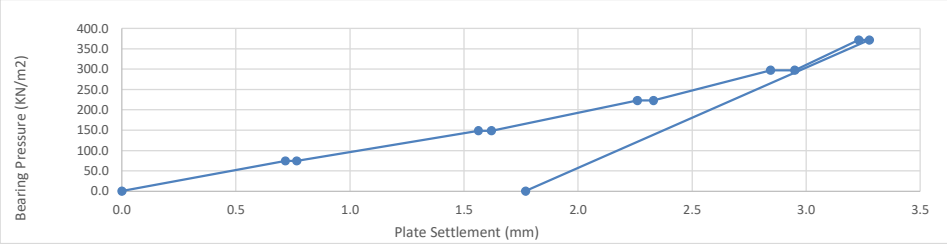
UKAS TESTING

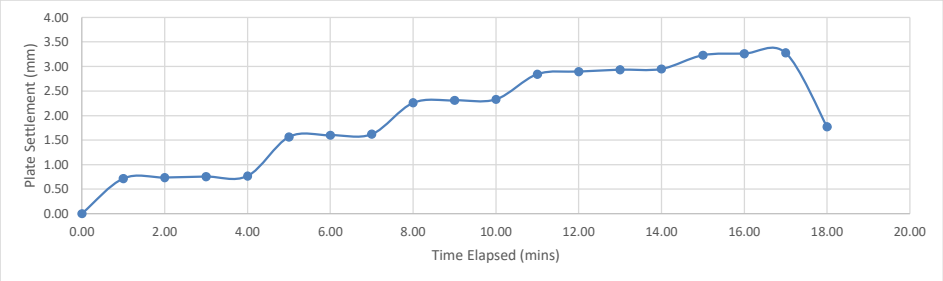
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BU |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 21/09/2022 |
| | Thistle Road | **Weather Conditions** | Sunny, Dry |
| | Littleburn Industrial Estate | **Air Temperature °C** | 16°C |
| | Langley Moor | **Sample Description** | Stone |
| | DH7 8HJ | **Reaction Load** | 17t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 600 | **Test Location** | PLT6 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 371 | **Maximum Deformation (mm)** | 3.28 |
| **Pressure at 1.25mm penetration (kPa)** | 119 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 111.3 |
| **Calculated CBR (%) at 1.25mm** | 18 | | |

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**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

J. Curry

Approved Date: 22 September 2022

EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
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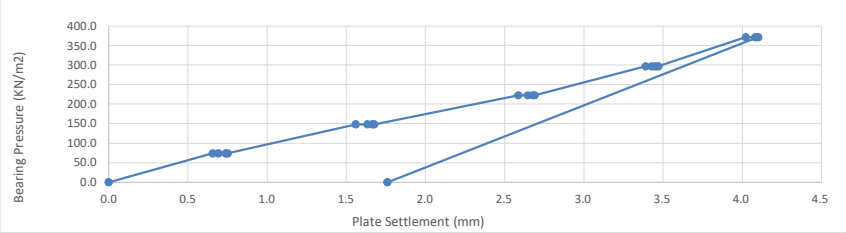
Tel. (+44) 0191 389 6543

UKAS TESTING

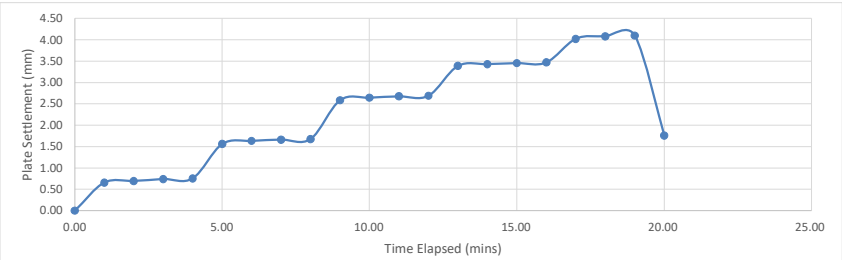
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BZ |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 05/10/2022 |
| | Thistle Road | **Weather Conditions** | Rain |
| | Littleburn Industrial Estate | **Air Temperature °C** | 14°C |
| | Langley Moor | **Sample Description** | Stone |
| | DH7 8HJ | **Reaction Load** | 18t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 600 | **Test Location** | PLT1 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 371 | **Maximum Deformation (mm)** | 4.10 |
| **Pressure at 1.25mm penetration (kPa)** | 120 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 112.0 |
| **Calculated CBR (%) at 1.25mm** | 18 | | |

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**Test Carried Out By:**

D. Rutter

Materials Technician

**Approved By:**

J. Curry

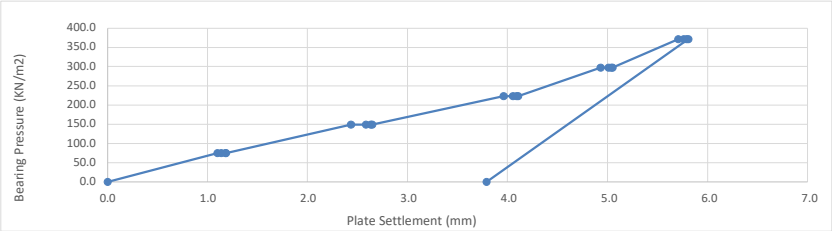
Approved Date: 06 October 2022

EXPLORATION
& TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

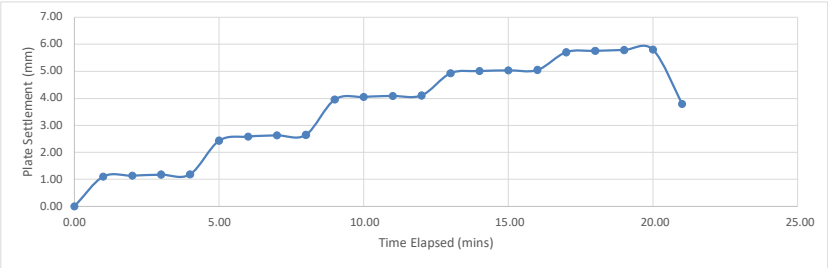
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BZ |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 05/10/2022 |
| | Thistle Road | **Weather Conditions** | Rain |
| | Littleburn Industrial Estate | **Air Temperature °C** | 14°C |
| | Langley Moor | **Sample Description** | Stone |
| | DH7 8HJ | **Reaction Load** | 18t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 600 | **Test Location** | PLT2 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 371 | **Maximum Deformation (mm)** | 5.81 |
| **Pressure at 1.25mm penetration (kPa)** | 78 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 69.7 |
| **Calculated CBR (%) at 1.25mm** | 8.6 | | |

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D. Rutter

Materials Technician

**Approved By:**

J. Curry

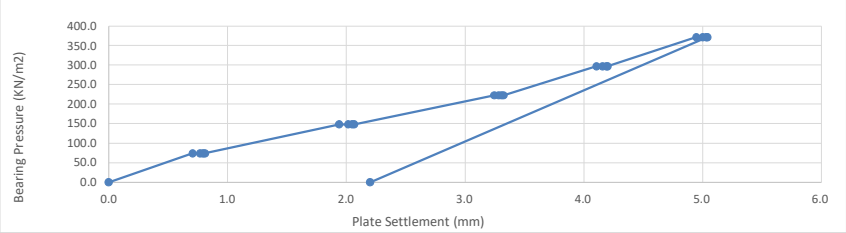
Approved Date: 06 October 2022

EXPLORATION & TESTING ASSOCIATES
Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD
Tel. (+44) 0191 389 6543

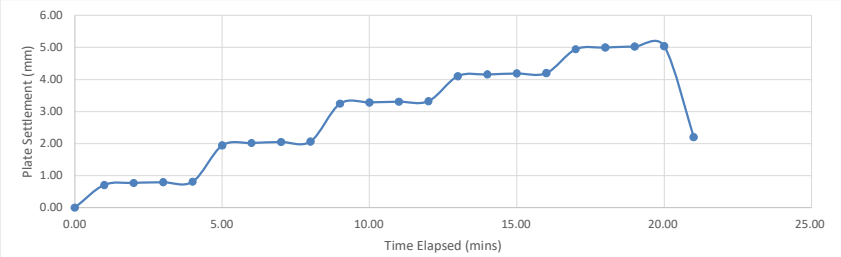
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BZ |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 05/10/2022 |
| | Thistle Road | **Weather Conditions** | Rain |
| | Littleburn Industrial Estate | **Air Temperature °C** | 14°C |
| | Langley Moor | **Sample Description** | Stone |
| | DH7 8HJ | **Reaction Load** | 18t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 600 | **Test Location** | PLT3 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 371 | **Maximum Deformation (mm)** | 5.04 |
| **Pressure at 1.25mm penetration (kPa)** | 103 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 94.7 |
| **Calculated CBR (%) at 1.25mm** | 14 | | |

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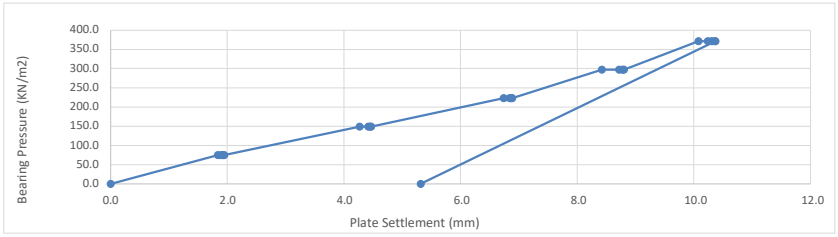
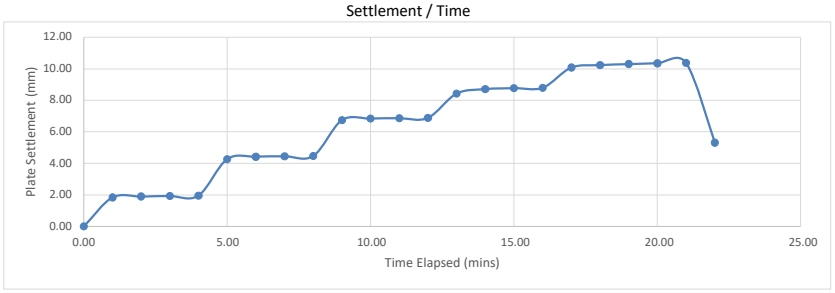
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BZ |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 05/10/2022 |
| | Thistle Road | **Weather Conditions** | Rain |
| | Littleburn Industrial Estate | **Air Temperature °C** | 14°C |
| | Langley Moor | **Sample Description** | Stone |
| | DH7 8HJ | **Reaction Load** | 18t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 600 | **Test Location** | PLT4 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 371 | **Maximum Deformation (mm)** | 10.37 |
| **Pressure at 1.25mm penetration (kPa)** | 51 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 43.0 |
| **Calculated CBR (%) at 1.25mm** | 4.0 | | |

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Materials Technician

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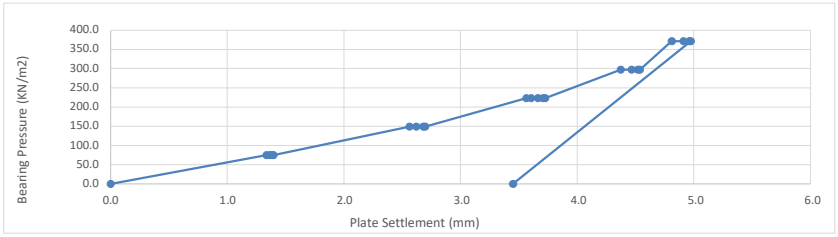
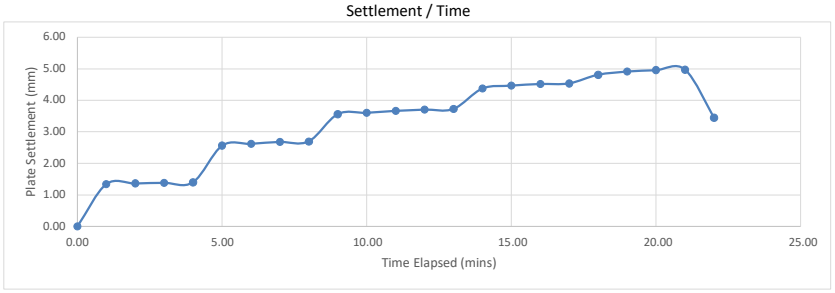
**Test Report**
**Determination of the Vertifcal Deformation and Strength Characteristics of Soil by the Plate Load Testing**
**BS 1377-9:1990 Clause 4.1**

| | | | |
|---|---|---|---|
| **Project** | Envision, Washington | **Job Number** | D10557BZ |
| **Client** | Groundwork Services (Durham) Limited | **Date Tested** | 05/10/2022 |
| | Thistle Road | **Weather Conditions** | Rain |
| | Littleburn Industrial Estate | **Air Temperature °C** | 14°C |
| | Langley Moor | **Sample Description** | Stone |
| | DH7 8HJ | **Reaction Load** | 18t Tracked Excavator |
| **Depth of Test from Groundlevel** | 0 | **Density & Moisture** | Not Requested |
| **Plate Diameter (mm)** | 600 | **Test Location** | PLT5 |
| **Distance between the edge of the plate and the wall of the excavation (mm)** | | | N/A |

Pressure Applied / Plate Setlement




Settlement / Time




| | | | |
|---|---|---|---|
| **Maximum Pressure Applied (kPa)** | 371 | **Maximum Deformation (mm)** | 4.97 |
| **Pressure at 1.25mm penetration (kPa)** | 69 | **Modulus of Subgrade Reaction (Mn/M²/M)** | 61.1 |
| **Calculated CBR (%) at 1.25mm** | 7.0 | | |

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