

AEDI Construction Ltd.,  
Unit 4 Royal Mills,  
17 Redhill St,  
Manchester,  
M4 5BA

Civil & Remediation Ltd.,  
Grosvenor House,  
3 Chapel St,  
Congleton,  
Cheshire,  
CW12 4AB

## **Civil and Remediation**

### **C322 – Ardwick Green, Manchester**

#### **Technical Note – Late Design Change Creating Additional Foundation Loading**

#### **Requirements Along Gridline J Block 2 (Along Cotter St.)**

#### **C322.TN.FNDS.001**

### **1.0 Introduction**

C&R have been appointed as the Enabling Works Contractor for the Ardwick Green development works.

During the pre-commencement design meeting, C&R proposed an alternative remediation design, including the turnover of the site to 1m bGL, removal of any localised cohesive Glacial Till and backfilling with a Class 1 or Class 6 material to underside of foundation. The underside of foundation was then to be tested to ensure compliance with the proposed (by Civic design team) and agreed 125kN/m<sup>2</sup> loading requirements (as agreed at the pre-commencement design meeting). The site was then to be reengineered using general fill materials up to the earthworks finished levels for the plots & car park. This approach reduced costs of earthworks as requested by AEDI in reducing foundation depth and was accepted by AEDI and Civic.

C&Rs were instructed to provide an earthworks design and asked to seek savings/reductions where possible, based on 125kN/m<sup>2</sup> loading design option for reduced foundation depths and agreed (as specified above) the option following plotting of granular materials at around -1m bGL submitted an alternative design (in conjunction with BWB).

### **2.0 Works and Testing**

As discussed and agreed (with reduction in earthworks price submitted) during the pre-commencement design meeting, the underside of foundation (UoF) was to achieve a loading specification of 125kN/m<sup>2</sup>. This was tested for on site by loading the plate incrementally up to 142kN/m<sup>2</sup> based on standard hydraulic press & testing increments. At 142kN/m<sup>2</sup> the testing was determined as significantly above the 125kN/m<sup>2</sup> loading, but could have been



progressed to attain a higher result. At above 125kN/m<sup>2</sup> it was decided to stop the tests at 142kN/m<sup>2</sup> as a pass and commence the backfilling earthworks (with approval from AEDI) as to maximise production, programme and mitigate the winter working risk.

Works in block 2 (north block) were completed in accordance with C&Rs proposal, as agreed at the pre-commencement design meeting. The agreed 125kN/m<sup>2</sup> loading was achieved in block 2 at the UoF, which was recorded as a granular Glacial Till (Class 1C). These works were handed over through C&Rs Q110 form, with all detailed As-Built information, including the plate testing results, issued upon completion of the backfill (form issued 24/10/24, signed by AEDI 25/10/24).

Following commencement of works in block 1 (south block), an email was issued on 05/11/24 (10 days following sign-off of works in Block 1) by AEDI (Chris Haworth) forwarding on queries from the design engineer Civic (Hannah Keighley) regarding gridline J (along Cotter St.) having a loading requirement of 150kN/m<sup>2</sup>, rendering previously completed, handed over and issued plate test results alone unsuitable. This is contrary to the agreed specification of 125kN/m<sup>2</sup> as agreed in the pre-commencement design meeting.

This constitutes a design change 10 days after works completion & agreed handover in the north block area (block 2).

Note that the boundary along Cotter Street was excavated, using an underpinning method, to 700mm below UoF level during additional relict foundation removal works. This was backfilled to UoF level with 6F2 material produced on site, in accordance with the *MCHW* Series 600 & C&R/BWB design and noted as an option to improve from the 142kN/m<sup>2</sup> (when design was 125kN/m<sup>2</sup>) loading (that would have been over 150kN/m<sup>2</sup> loading if the testing had continued). This was discussed on site, witnessed on site & is as the agreed and signed handover forms.

To prove that the granular Glacial Till was of the required loading requirements, C&R opted to conduct an incremental plate test in the south block up to 180kN/m<sup>2</sup> at UoF, which passed. Note the test was extended on block 1 to provide proof that if block 2 testing had been continued, it would have exceeded the design change new loading of 150kN/m<sup>2</sup> in any event.

### 3.0 Suitability of Underside of Foundation Strata

It is of both C&Rs and BWBs professional opinion that the UoF along gridline J is suitable to achieve 150kN/m<sup>2</sup> loading requirements based on the below calculations and interpretations.

#### 3.1 Calculations

Extrapolation of the nearest plate test results has been conducted to estimate the geotechnical properties of the soils along gridline J. The testing is within 5m of gridline J and the geology is consistent, with extrapolations taken from the worst case in block 2 (PT04).

Extrapolation of settlement has been calculated in accordance with Eurocode 7, as follows:

$$\text{Settlement at } 150\text{kN/m}^2 = 7.87 \text{ (PT04)} \times (150/142) = 8.31\text{mm}$$

Based on this minor extrapolation, the resulting foundation settlement has been calculated based on the foundation design as follows:

$$S_f = S_p \times (2B_f/B_f + B_p)^2$$

Where:

- $S_f$  = foundation settlement
- $S_p$  = measured settlement on plate test
- $B_f$  = width of foundation
- $B_p$  = width of the test plate

The second part of this equation has been summarised to equal 2.02 in granular soils in accordance with the foundation design on Gridline J (750mm width) and testing on site. Therefore, the foundation settlement based on the nearest plate test result extrapolation equals:

$$B_f = 8.31 \times 2.02 = 16.79\text{mm}$$

This is within the acceptable limits of settlement in accordance with Eurocode 7.

Furthermore, in accordance with the MCHW Series 600 method for compacted 6F2, which achieves a density of 20kN/m<sup>3</sup> under a method related compaction exercise, the net

additional pressure applied to the natural ground due to the replacement of Made Ground has been evaluated as:

$$(20 \times 0.7) - (16 \times 0.7) = 2.8 \text{ kPa}$$

This results in an adjusted total bearing pressure of:

$$142 + 2.8 = 145 \text{ kN/m}^2$$

which remains within an acceptable range for gridline J, considering the extrapolated results from nearby plate tests.

### 3.2 Further Reasoning

Given the site conditions, full remediation exercise to 2m bOGL, removal of all relict foundations, consistent geology and small site size, we believe the Factor of Safety can be reduced for the foundation design given all the additional information, from the standard Eurocode 7 factor of 3.0. This is for Civic to consider and would subsequently reduce the loading requirements.

It is C&Rs opinion that based on ground conditions observed on site, if the design change was informed prior to completion of block 2 we would have been able to test up to  $180 \text{ kN/m}^2$  (as we subsequently did for block 1), and this would have passed.

## 4.0 Conclusion

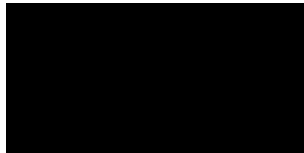
It is of C&Rs and BWBs opinion that the plate testing results and works are suitable to achieve the required  $150 \text{ kN/m}^2$  loading requirements, and that it is possible that the factor of safety can be reduced by Civic.

This scenario has arose due to a design change post completion of the works in block 2, which has been mitigated through the previous noted 700mm layer of 6F2 installations below grid line J as the above logic and calculations. This could have been avoided had the design been fixed prior to the commencement of works, in accordance with C&Rs accepted Tender, Contractors Proposals and BWBs design.

For the sake of completeness and ease of reference, relevant drawings have been issued in Appendix A from the signed handover form, including the base of excavation, as built foundation level As-Built & civic foundation design; the relevant geotechnical testing results

are issued in Appendix B, including plate tests 3 & 4 (adjacent to gridline J), granular Glacial Till grading results and 6F2 grading results.

If any further information is required about the contents of this technical note, please contact C&Rs Geo-Environmental Manager, as signed below.



## APPENDIX A – DRAWINGS



# FOUNDATION LVL ASBUILT PLAN NORTH BLOCK (BLOCK Z)

REMOVED WALL + EXCAVATED TO UNDERSIDE OF 400mm THICK FOUNDATION  
COMPACTED + FILLED BACK TO FORMATION, (CLASS 1A NATURAL GRANULAR MATERIAL  
ENCOUNTERED AT UNDERSIDE OF FOUNDATION)  
WORKS CARRIED OUT ON 23/10/24

N 397322867  
E 385209498

1 NB1  
0.62m  
@ 142 kN/m<sup>2</sup>

2 NB2  
1.16m  
@ 142 kN/m<sup>2</sup>

3 NB3  
0.82m  
@ 142 kN/m<sup>2</sup>

4 NB4  
7.87m  
@ 142 kN/m<sup>2</sup>

N 397311743  
E 385228805

AREA RE-EXCAVATED TO  
APPROX. 2.0m BELOW OGL  
(MARKS). DUE TO PROXIMITY TO BACK OF  
FOOTPATH, UNDERPINNING METHOD WAS USED.  
ENTIRE AREA WAS FILLED WITH GFZ + COMPACTED  
IN LAYERS USING EXCAVATOR MOUNTED PLATE COMPACTOR.  
WORKS CARRIED OUT ON 21+22/10/24

EXCAVATED ENTIRE AREA, TO UNDERSIDE OF 525mm  
THICK FOUNDATIONS OR DEEPER WHERE OBSTRUCTIONS  
WERE PRESENT. INSTALLED A 250mm THICK LAYER  
OF CLASS 1C MADE GROUND + COMPACTED.  
CARRIED OUT 4X INCREMENTAL PLATE TESTS AT  
UNDERSIDE OF 525mm THICK FOUNDATION  
EXCAVATION COMPLETE + LAYER PLACED ON 15/10/24  
TESTS CARRIED OUT ON 16/10/24

C&R  
civil-remediation.com

Job Title  
Ardwick

Location  
Manchester

Client  
AEDI

## Notes

REVISED FOUNDATION DEPTHS  
ADVISED BY AEDI ON 21/10/24

REVISED FOUNDATION DEPTHS  
CONFIRMED BY CIVIL ON  
23/10/24

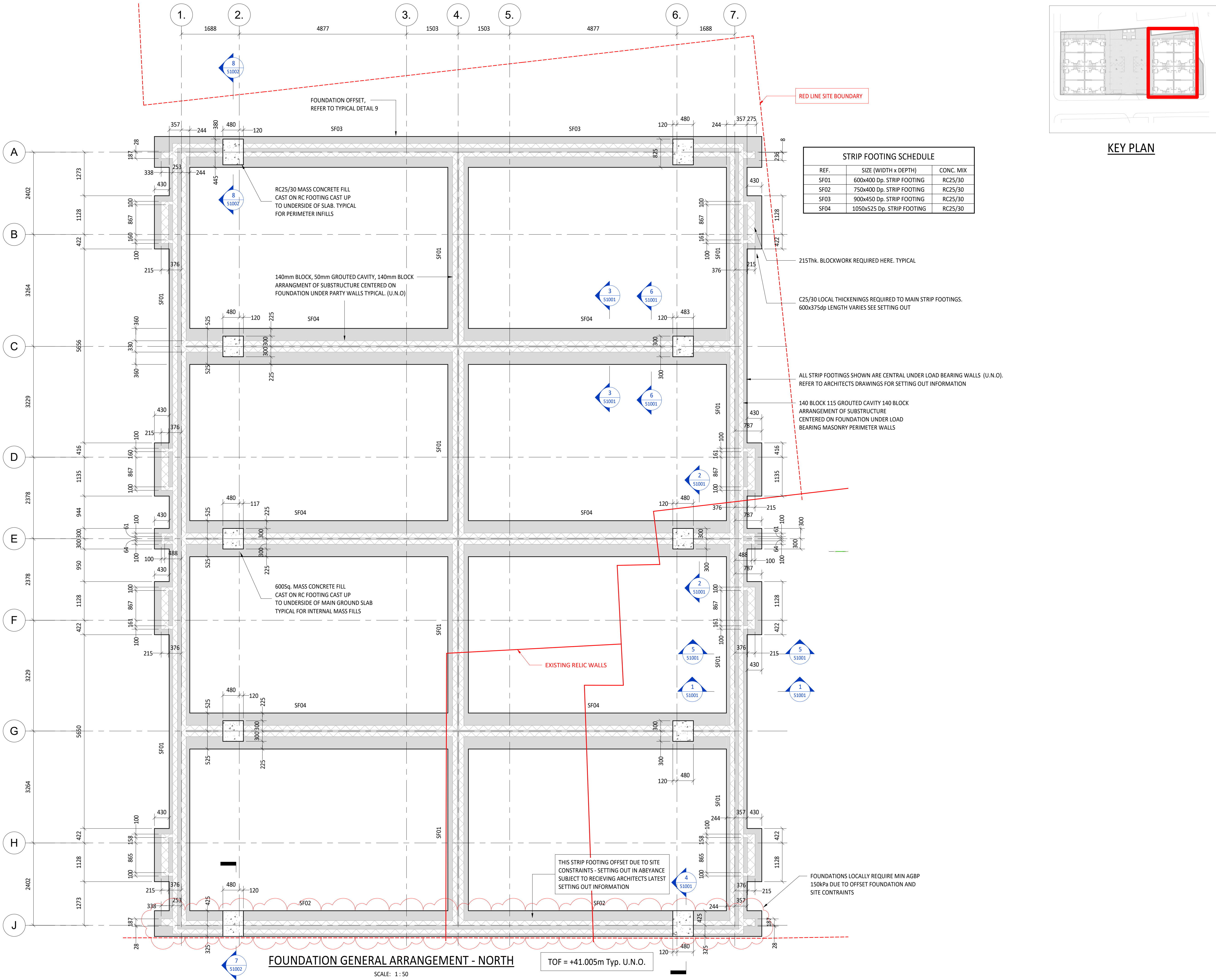
| Rev | Date | Description |
|-----|------|-------------|
|     |      |             |

Drawing Status

Drawing Title

|                  |        |               |     |
|------------------|--------|---------------|-----|
| C&R Project Code | C305.2 | Scale         | NTS |
| Date Drawn       |        | Drawn By      |     |
| Reviewed By      |        | Original Size | A3  |

|                |  |     |   |
|----------------|--|-----|---|
| Drawing Number |  | Rev | A |
|----------------|--|-----|---|



STANDARD NOTES

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S AND ENGINEER'S DRAWINGS AND THE SPECIFICATIONS.
- THIS DRAWING SHOULD NOT BE SCALED.
- ALL DIMENSIONS ARE TO BE VERIFIED BY THE CONTRACTOR ON SITE.
- ALL DISCREPANCIES SHOULD BE REPORTED TO C.A./E.A. PRIOR TO THE COMMENCEMENT OF WORKS.

© CIVIC ENGINEERS LIMITED

**FOUNDATION NOTES**

- LEVELS AND SETTING OUT TO BE CONFIRMED BY ARCHITECT
- ALL DAMP PROOFING AND WATERPROOFING TO ARCHITECTS DETAILS
- REFER TO ARCHITECT DRAWINGS FOR POP-UP LOCATIONS
- FOR ANY INCOMING BELOW GROUND SERVICES REFER TO MEP ENGINEER DRGS
- ALL STRIP FOOTINGS TO BE GRADE RC25/30 CONCRETE U.N.O
- ALL STRIP FOOTINGS TO BE CENTRAL UNDER ALL WALLS U.N.O
- GROUND IMPROVEMENT REQUIRED TO BE DESIGNED AND DETAILED BY SPECIALIST SUBCONTRACTOR
- FOUNDATION DESIGN BASED ON ASSUMPTION GROUND IMPROVEMENT ACHIEVES ALLOWABLE GROUND BEARING PRESSURE (AGBP) OF 125kPa. UNO TBC BY SPECIALIST CONTRACTOR.
- ALL STRIP FOOTING TO HAVE B78S MESH TOP & BOTTOM UNO. MAIN BAR SIZE IN SHORT DIRECTION OF FOOTING.
- THIS DRAWINGS IS TO BE READ IN CONJUNCTION WITH CIVIC ENGINEERS GENERAL NOTES DRAWING; 2075-CIV-XX-XX-T-S-00001
- FOUNDATION DESIGN BASED UPON RECEIVED INITIAL LOAD TAKEDOWN OF TIMBER FRAME SUPERSTURCTURE PROVIDED BY TIMBER SPECIALIST: "11854 - Line Loads". SUBSTRUCTURE TBC FOLLOWING RECIPT OF FINAL LOADINGS FROM TIMBER FRAME DESIGNER.
- REFER TO CIVIC ENGINEERS DRAINAGE GENERAL ARRANGMENT 2075-CIV-XX-XX-D-C-30001 FOR WHERE DRAINAGE SLEEVES THROUGH THROUGH SUBSTRUCTURE ELEMENTS
- ALL FOUNDATIONS TO HAVE A MINIMUM THICKNESS OF ENGINEERED STRATA FROM UNDERSIDE OF FOOTING TO TOP OF COHESIVE STRATA. MIN DEPTH OF ENGINEERED STRATA FROM UNDERSIDE OF FOOTING TO TOP OF COHESIVE STRATA TO BE 1150mm. REFER TO TYPICAL DETAIL "TYP1" ON DRAWING 2075-CIV-XX-XX-D-S-51002

|          |     |                        |       |      |
|----------|-----|------------------------|-------|------|
| 19.08.24 | P02 | ISSUED FOR INFORMATION | JS    | DC   |
| 30.04.24 | P01 | RIBA STAGE 4 ISSUE     | CG    | DC   |
| DATE     | REV | DESCRIPTION            | DRAWN | CHKD |

**Civic Engineers**

MANCHESTER Carver's Warehouse, 77 Dale St, Manchester, M1 2HG. Tel: 0161 228 6757  
LONDON Reeds Wharf, 33 Mill Street, London SE1 2AX. Tel: 020 7253 2977  
LEEDS 1 Saw Mill Street, Water Lane, Leeds, LS11 5WE. Tel: 0113 2025 130  
GLASGOW 35 Virginia Street, Glasgow, G1 1TN. Tel: 0141 570 1825

[www.civicingineers.com](http://www.civicingineers.com)

PROJECT

**ARDWICK GREEN  
MANCHESTER**

TITLE

**FOUNDATION GENERAL ARRANGMENT  
NORTH**

|                          |            |              |       |             |  |
|--------------------------|------------|--------------|-------|-------------|--|
| DRAWING STATUS           |            |              |       | STATUS CODE |  |
| <b>RIBA STAGE 4</b>      |            |              |       |             |  |
| CE PROJECT No.           | SCALE @ A1 | DATE CREATED | DRAWN | CHECKED     |  |
| 2075                     | SHOWN      | APRI.24      | CG    | DC          |  |
| DRAWING No.              |            |              |       | REV         |  |
| 2075-CIV-XX-B1-D-S-50001 |            |              |       | P02         |  |



Job Title  
Ardwick

Location  
Manchester

Client  
AEDI

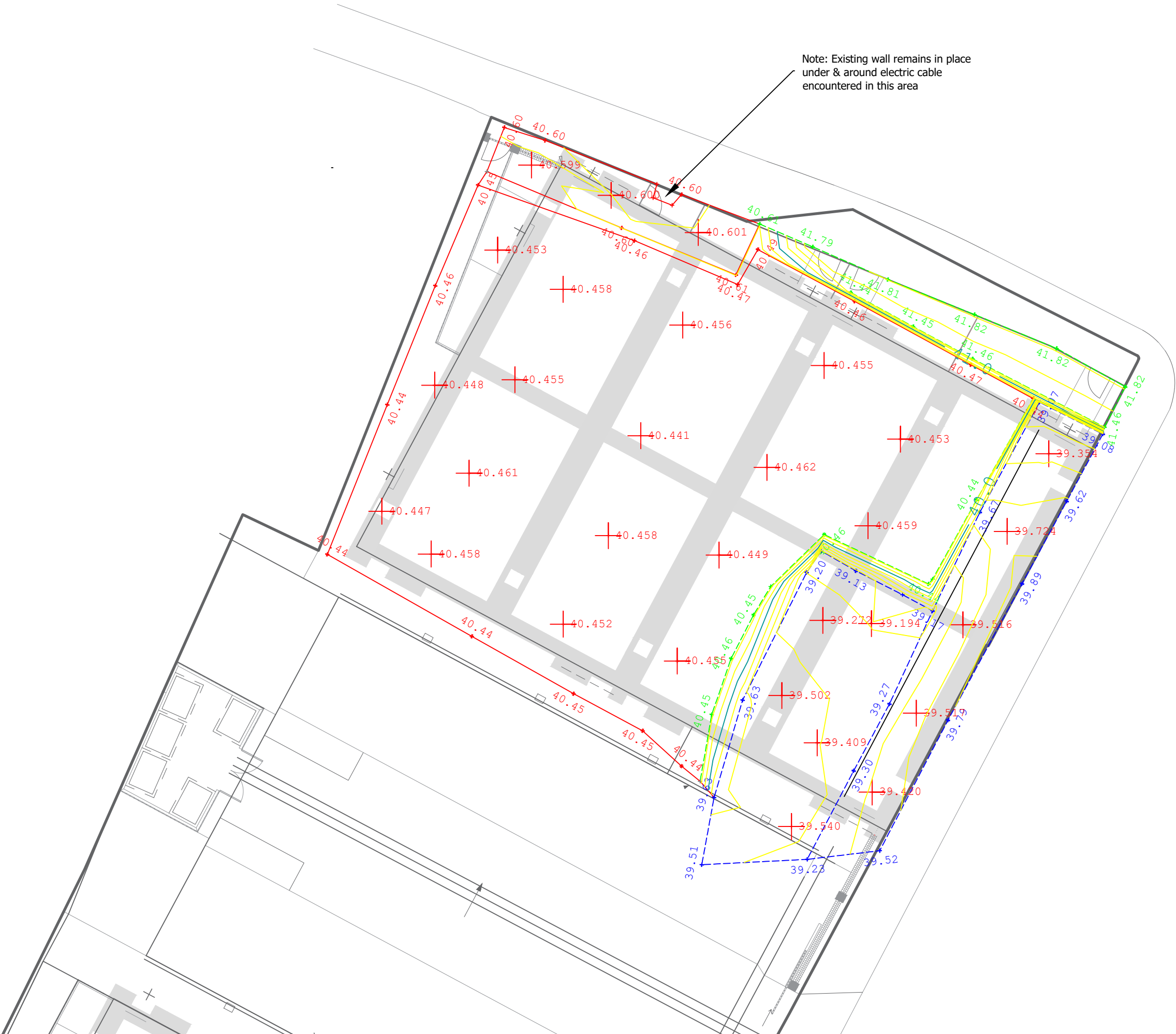
Key

- Extent of excavation to underside of foundation
- Top of batter
- Bottom of batter
- Spot Level

Contours are 200mm  
Please read in conjunction with all other documents issued with North Block (Block 2) Handover package

| Rev                                                       | Date     | Description |
|-----------------------------------------------------------|----------|-------------|
| A                                                         | 24/10/24 | First Issue |
| Drawing Status<br>As-Built                                |          |             |
| Drawing Title<br>Block 2 (North Block) Base of Excavation |          |             |
| C&R Project Code C322 Scale 1:150@A3                      |          |             |
| Date Drawn 24/10/24                                       |          |             |
| Drawn By AR                                               |          |             |
| Reviewed By TM                                            |          |             |
| Original Size A3                                          |          |             |
| Drawing Number<br>C322/BOD/ASB/001                        |          | Rev<br>A    |

Note: Existing wall remains in place under & around electric cable encountered in this area



## APPENDIX B – RELEVANT GEOTECHNICAL TESTING



**Determination of Particle Size Distribution**

**SIEVE ANALYSIS**

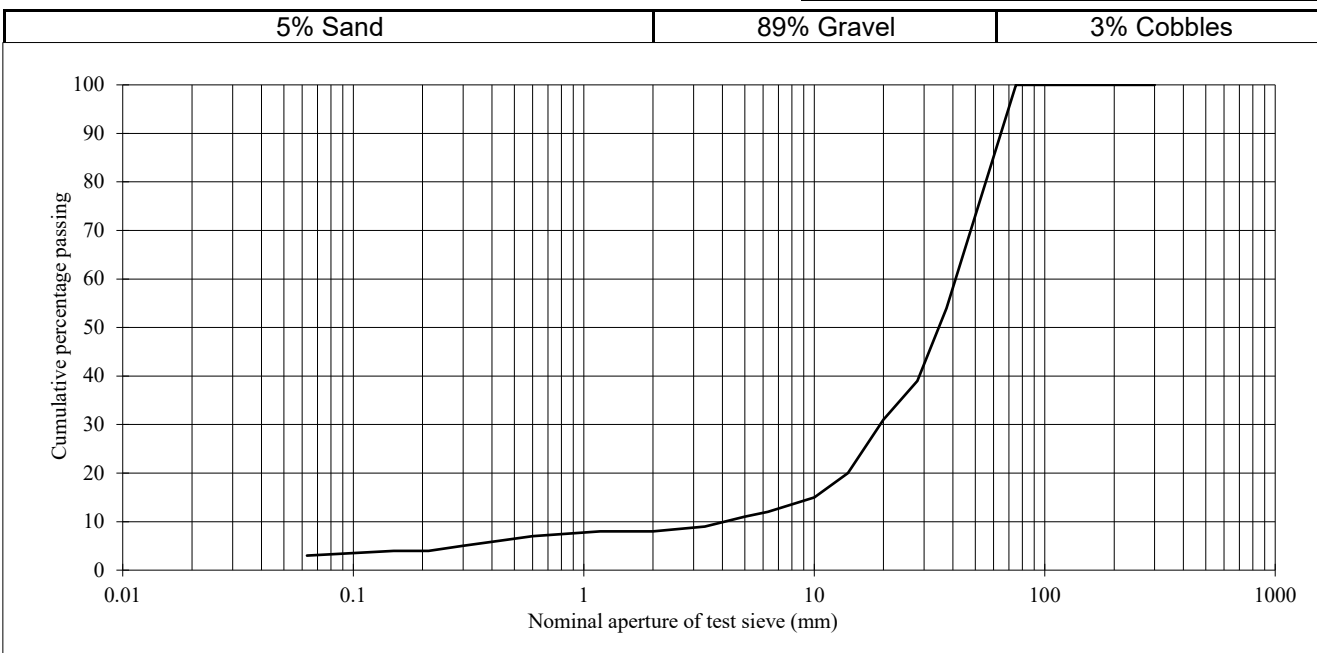
Report No.: TD24-C-07-C-19      Report Date: 13/11/24  
 Client: Civil & Remediation  
 Client Address: Grosvenor House, 3 Chapel Street, Cheshire, CW12 4AB  
 Site: Ardwich Green, Manchester  
 Client Ref.\*: GT/6F2/1/1      Lab Ref: Lab 24/3537  
 Date Sampled\* 16/10/24      Sample Type: Bulk  
 Sampled By: Client      Mass (kg): 25  
 Date Received: 31/10/24

Location\*: Not Advised  
 Supplier\*: Client      Source\*: Site Produced  
 Description: Recycled 6F2

Date of Test: 07/11/24  
 Test Method: Washing and Sieving  
 Method of Preparation: BS 1377-1 & 2 : 1990  
 Material Specification: SHW Series 600 Table 6/2

Remarks: Sample complies with specification  
 Uniformity Coefficient = 10

| BS Sieve (mm) | Passing (%) | Material Specification |
|---------------|-------------|------------------------|
| 300           | 100         |                        |
| 125           | 100         | 100                    |
| 90            | 100         | 80 - 100               |
| 75            | 100         | 65 - 100               |
| 37.5          | 54          | 45 - 100               |
| 28            | 39          |                        |
| 20            | 31          |                        |
| 14            | 20          |                        |
| 10            | 15          | 15 - 60                |
| 6.3           | 12          |                        |
| 5.0           | 11          | 10 - 45                |
| 3.35          | 9           |                        |
| 2.00          | 8           |                        |
| 1.18          | 8           |                        |
| 0.600         | 7           | 0 - 25                 |
| 0.425         | 6           |                        |
| 0.300         | 5           |                        |
| 0.212         | 4           |                        |
| 0.150         | 4           |                        |
| 0.063         | 3           | 0 - 12                 |



Certified that the Particle Size Distribution was determined in accordance with BS 1377-2:1990, Method 9.2  
 Uniformity coefficient determined in accordance with SHW series 600 table 6/1 footnote 5  
 Where sampling was not carried out by TD Construction Testing Ltd, the results relate to the sample as received.  
 This report shall not be reproduced except in full without approval of the laboratory.  
 Decision rule - Any uncertainty is taken into consideration within the test standard and reporting method.  
 Results relate only to the sample tested.      \* Information supplied by client.

|        |  |                                 |
|--------|--|---------------------------------|
| Signed |  | J. Wright (Lab Section Manager) |
|--------|--|---------------------------------|

**TD Construction Testing Ltd**

**Gerard Hall  
40 Lord Street  
St Helens  
Merseyside  
WA10 2SD**



8011

**TEST REPORT**



**T: 01744 734769**

**E: [enquiries@tdconstructiontesting.co.uk](mailto:enquiries@tdconstructiontesting.co.uk)**

**Determination of Moisture Content to BS 1377-2:1990**

Report No: TD24-C-07-C-11  
Client: Civil & Remediation  
Client Address: Grosvenor House, 3 Chapel Street, Congleton, Cheshire, CW12 4AB  
Site: Ardwick Green, Manchester  
Supplier/Source: Client - Site Won

Report Date: 12/11/2024  
Date Sampled\*: 16/10/2024  
Sampled By: Client  
Date Received: 31/10/2024  
Date Tested: 06/11/2024

| Laboratory Reference | Client Reference* | Sample Location* | Material Description          | Moisture Content % | Remarks |
|----------------------|-------------------|------------------|-------------------------------|--------------------|---------|
| Lab 24/3534          | GT/GGT/BOD/1/1    | Not Advised      | Gravel with Brown Sand & Clay | 15                 | -       |
|                      |                   |                  |                               |                    |         |
|                      |                   |                  |                               |                    |         |
|                      |                   |                  |                               |                    |         |
|                      |                   |                  |                               |                    |         |

Certified that the testing was conducted in accordance with BS 1377-2:1990 Clause 3.2 at 105°C unless stated

Sample preparation in accordance with BS 1377-1:2016

Where sampling was not carried out by TD Construction Testing Ltd, the results relate to the sample as received.

This report shall not be reproduced except in full without approval of the laboratory.

Results relate only to the sample tested.

\* Information supplied by client.

Comments/Deviations:

Signed:

J. Wright (Lab Section Manager)

**Determination of Particle Size Distribution**

**SIEVE ANALYSIS**

Report No.: TD24-C-07-C-12      Report Date: 12/11/24  
 Client: Civil & Remediation  
 Client Address: Grosvenor House, 3 Chapel Street, Cheshire, CW12 4AB  
 Site: Ardwich Green, Manchester

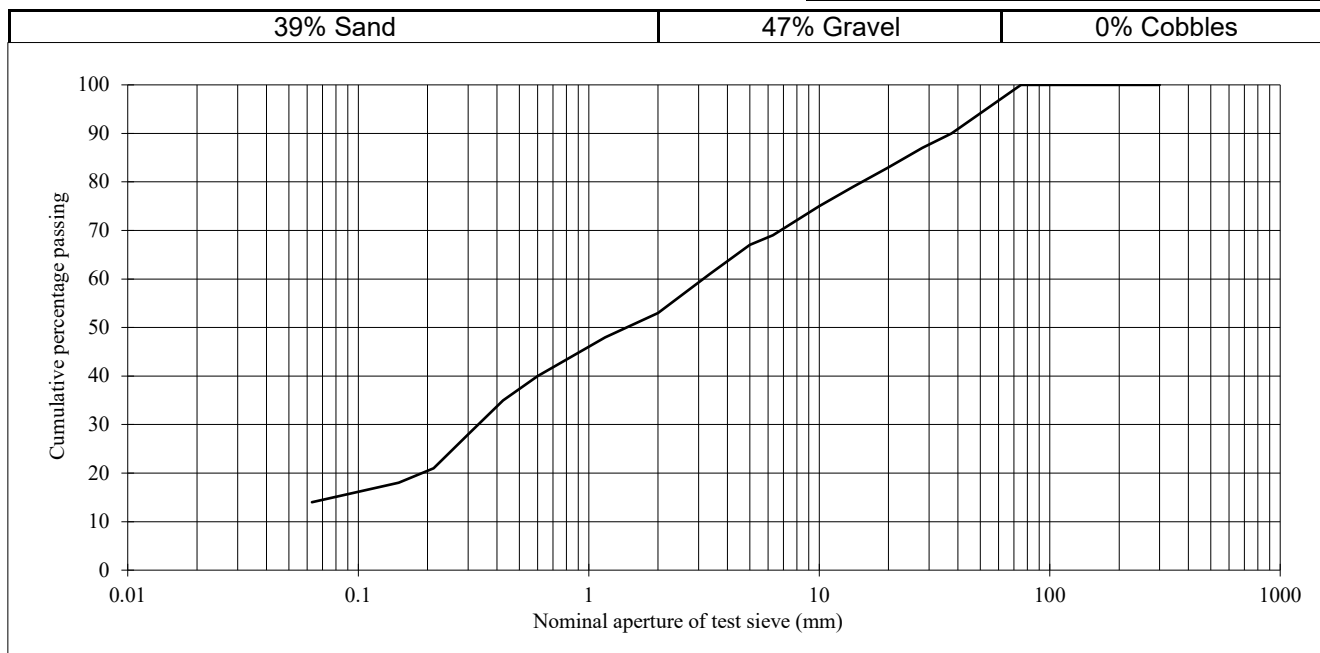
Client Ref.\*: GT/GGT/BOD/1.1      Lab Ref: Lab 24/3534  
 Date Sampled\* 16/10/24      Sample Type: Bulk  
 Sampled By: Client      Mass (kg): 20  
 Date Received: 31/10/24

Location\*: Not Advised  
 Supplier\*: Client      Source\*: Site Won  
 Description: Gravel with Brown Sand & Clay (1A)

Date of Test: 07/11/24  
 Test Method: Washing and Sieving  
 Method of Preparation: BS 1377-1 & 2 : 1990  
 Material Specification: SHW Series 600 Table 6/2

| BS Sieve (mm) | Passing (%) | Material Specification |
|---------------|-------------|------------------------|
| 300           | 100         | 100                    |
| 125           | 100         | 95 - 100               |
| 90            | 100         |                        |
| 75            | 100         |                        |
| 37.5          | 90          |                        |
| 28            | 87          |                        |
| 20            | 83          |                        |
| 14            | 79          |                        |
| 10            | 75          |                        |
| 6.3           | 69          |                        |
| 5.0           | 67          |                        |
| 3.35          | 61          |                        |
| 2.00          | 53          |                        |
| 1.18          | 48          |                        |
| 0.600         | 40          |                        |
| 0.425         | 35          |                        |
| 0.300         | 28          |                        |
| 0.212         | 21          |                        |
| 0.150         | 18          |                        |
| 0.063         | 14          | 0 - 15                 |

Remarks:



Certified that the Particle Size Distribution was determined in accordance with BS 1377-2:1990, Method 9.2  
 Where sampling was not carried out by TD Construction Testing Ltd, the results relate to the sample as received.  
 This report shall not be reproduced except in full without approval of the laboratory.  
 Decision rule - Any uncertainty is taken into consideration within the test standard and reporting method.  
 Results relate only to the sample tested.      \* Information supplied by client.

|        |                                 |
|--------|---------------------------------|
| Signed | J. Wright (Lab Section Manager) |
|--------|---------------------------------|

**TD Construction Testing Ltd**

**Gerard Hall  
40 Lord Street  
St Helens  
Merseyside  
WA10 2SD**



8011

**TEST REPORT**



**T: 01744 734769**

**E: enquiries@tdconstructiontesting.co.uk**

**Determination of Moisture Content to BS 1377-2:1990**

Report No: TD24-C-07-C-18  
Client: Civil & Remediation  
Client Address: Grosvenor House, 3 Chapel Street, Congleton, Cheshire, CW12 4AB  
Site: Ardwick Green, Manchester  
Supplier/Source: Client / Site Produced

Report Date: 13/11/2024  
Date Sampled\*: 16/10/2024  
Sampled By: Client  
Date Received: 31/10/2024  
Date Tested: 06/11/2024

| Laboratory Reference | Client Reference* | Sample Location* | Material Description | Moisture Content % | Remarks |
|----------------------|-------------------|------------------|----------------------|--------------------|---------|
| Lab<br>24/3537       | GT/6F2/1/1        | Not Advised      | Recycled 6F2         | 11                 | -       |
|                      |                   |                  |                      |                    |         |
|                      |                   |                  |                      |                    |         |
|                      |                   |                  |                      |                    |         |
|                      |                   |                  |                      |                    |         |

Certified that the testing was conducted in accordance with BS 1377-2:1990 Clause 3.2 at 105°C unless stated

Sample preparation in accordance with BS 1377-1:2016

Where sampling was not carried out by TD Construction Testing Ltd, the results relate to the sample as received.

This report shall not be reproduced except in full without approval of the laboratory.

Results relate only to the sample tested.

\* Information supplied by client.

Comments/Deviations:

|         |  |                                 |
|---------|--|---------------------------------|
| Signed: |  | J. Wright (Lab Section Manager) |
|---------|--|---------------------------------|

**TD Construction Testing Ltd**

**Gerard Hall  
40 Lord Street  
St Helens  
Merseyside  
WA10 2SD**



8011

**TEST REPORT**



**T: 01744 734769**

**E: enquiries@tdconstructiontesting.co.uk**

**Determination of Moisture Content to BS 1377-2:1990**

Report No: TD24-C-07-C-13  
Client: Civil & Remediation  
Client Address: Grosvenor House, 3 Chapel Street, Congleton, Cheshire, CW12 4AB  
Site: Ardwick Green, Manchester  
Supplier/Source: Client - Site Won

Report Date: 12/11/2024  
Date Sampled\*: 17/10/2024  
Sampled By: Client  
Date Received: 31/10/2024  
Date Tested: 06/11/2024

| Laboratory Reference | Client Reference* | Sample Location* | Material Description                | Moisture Content % | Remarks |
|----------------------|-------------------|------------------|-------------------------------------|--------------------|---------|
| Lab<br>24/3535       | GT/F/1/1          | Not Advised      | Recycled Aggregate with Sand & Clay | 15                 | -       |
|                      |                   |                  |                                     |                    |         |
|                      |                   |                  |                                     |                    |         |
|                      |                   |                  |                                     |                    |         |
|                      |                   |                  |                                     |                    |         |

Certified that the testing was conducted in accordance with BS 1377-2:1990 Clause 3.2 at 105°C unless stated

Sample preparation in accordance with BS 1377-1:2016

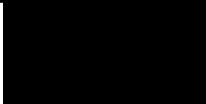
Where sampling was not carried out by TD Construction Testing Ltd, the results relate to the sample as received.

This report shall not be reproduced except in full without approval of the laboratory.

Results relate only to the sample tested.

\* Information supplied by client.

Comments/Deviations:

|         |                                                                                     |                                 |
|---------|-------------------------------------------------------------------------------------|---------------------------------|
| Signed: |  | J. Wright (Lab Section Manager) |
|---------|-------------------------------------------------------------------------------------|---------------------------------|

**Determination of Particle Size Distribution**

**SIEVE ANALYSIS**

Report No.: TD24-C-07-C-14      Report Date: 12/11/24  
 Client: Civil & Remediation  
 Client Address: Grosvenor House, 3 Chapel Street, Cheshire, CW12 4AB  
 Site: Ardwich Green, Manchester

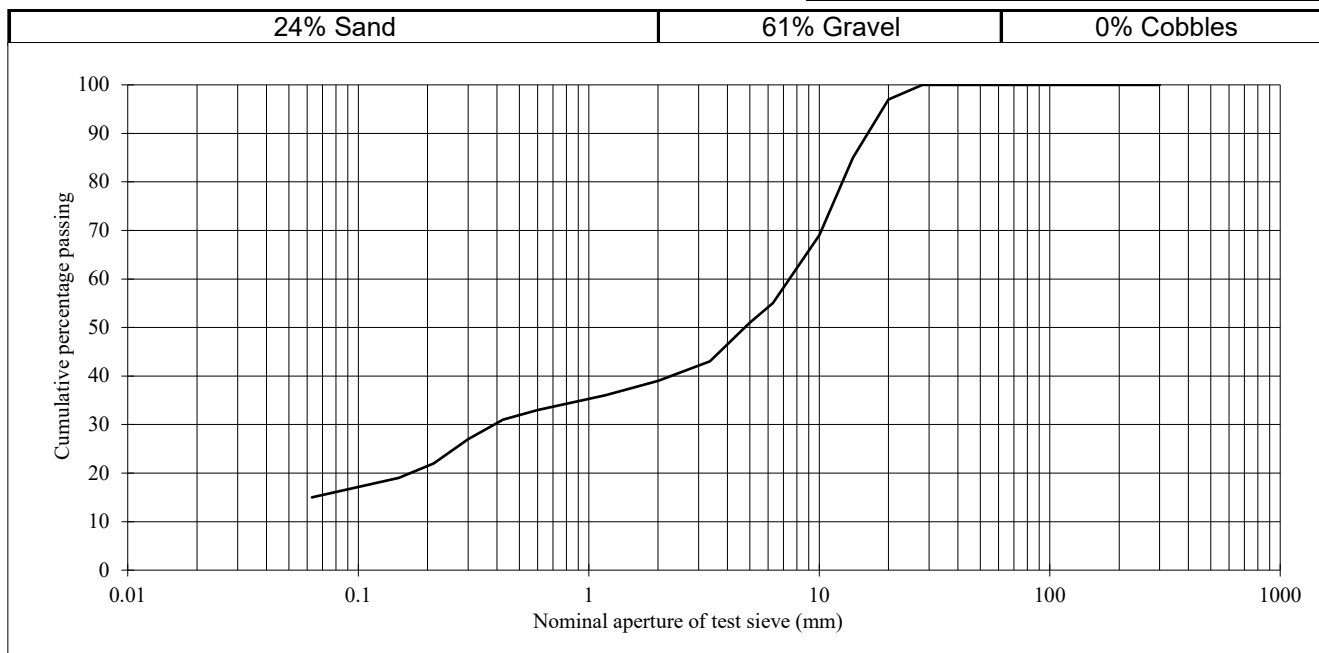
Client Ref.\*: GT/F/1/1      Lab Ref: Lab 24/3535  
 Date Sampled\* 17/10/24      Sample Type: Bulk  
 Sampled By: Client      Mass (kg): 25  
 Date Received: 31/10/24

Location\*: Not Advised  
 Supplier\*: Client      Source\*: Site Won  
 Description: Recycled Aggregate with Sand & Clay (2C)

Date of Test: 07/11/24  
 Test Method: Washing and Sieving  
 Method of Preparation: BS 1377-1 & 2 : 1990  
 Material Specification: SHW Series 600 Table 6/2

| BS Sieve (mm) | Passing (%) | Material Specification |
|---------------|-------------|------------------------|
| 300           | 100         | 100                    |
| 125           | 100         |                        |
| 90            | 100         |                        |
| 75            | 100         |                        |
| 37.5          | 100         |                        |
| 28            | 100         |                        |
| 20            | 97          |                        |
| 14            | 85          |                        |
| 10            | 69          |                        |
| 6.3           | 55          |                        |
| 5.0           | 51          | 15   -   80            |
| 3.35          | 43          |                        |
| 2.00          | 39          |                        |
| 1.18          | 36          |                        |
| 0.600         | 33          |                        |
| 0.425         | 31          |                        |
| 0.300         | 27          |                        |
| 0.212         | 22          |                        |
| 0.150         | 19          |                        |
| 0.063         | 15          | 15   -   80            |

Remarks:



Certified that the Particle Size Distribution was determined in accordance with BS 1377-2:1990, Method 9.2  
 Where sampling was not carried out by TD Construction Testing Ltd, the results relate to the sample as received.  
 This report shall not be reproduced except in full without approval of the laboratory.  
 Decision rule - Any uncertainty is taken into consideration within the test standard and reporting method.  
 Results relate only to the sample tested.      \* Information supplied by client.

|        |  |                                 |
|--------|--|---------------------------------|
| Signed |  | J. Wright (Lab Section Manager) |
|--------|--|---------------------------------|

TD Construction Testing Ltd  
Gerard Hall  
40 Lord Street  
St Helens  
Merseyside  
WA10 2SD



8011



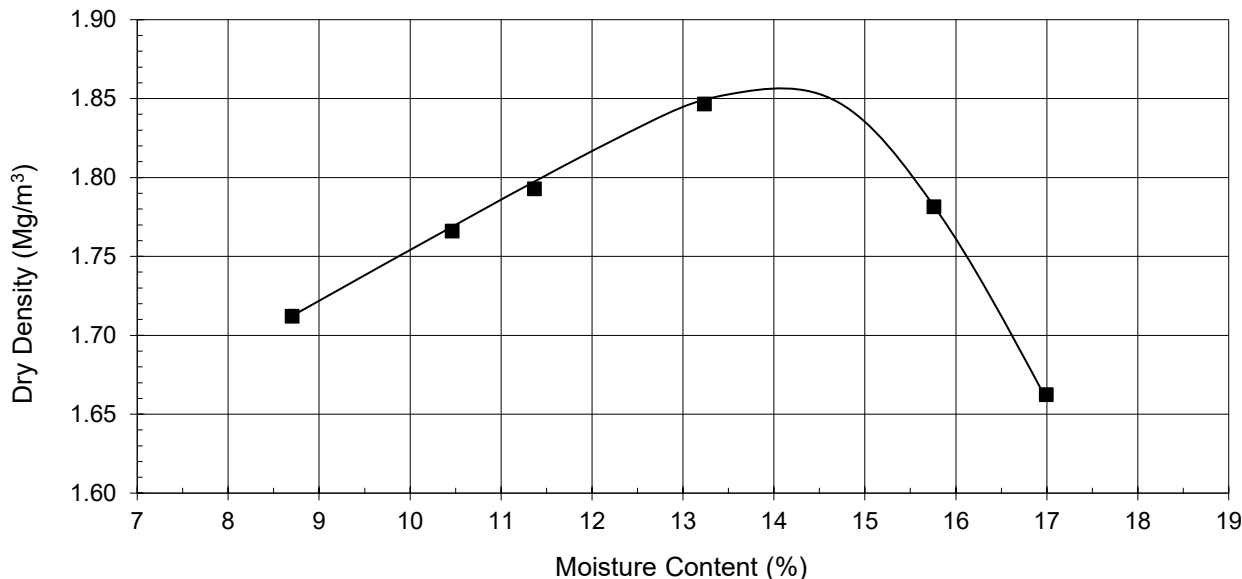
## TEST REPORT

T: 01744 734769

E: [enquiries@tdconstructiontesting.co.uk](mailto:enquiries@tdconstructiontesting.co.uk)

### Determination of Dry Density/Moisture Content Relationship

|                                                          |                                                      |                        |          |
|----------------------------------------------------------|------------------------------------------------------|------------------------|----------|
| Report No.:                                              | TD24-C-07-C-17                                       | Date Reported:         | 13/11/24 |
| Client:                                                  | Civil & Remediation                                  |                        |          |
| Client Address:                                          | Grosvenor House, 3 Chapel Street, Cheshire, CW12 4AB |                        |          |
| Site:                                                    | Ardwick Green, Manchester                            | Lab Ref:               | 24/3536  |
| Location*:                                               | Not Advised                                          | Client Sample Ref*:    | GT/F/1/2 |
| Type of Sample:                                          | Bulk                                                 | Sampled By:            | Client   |
| Sample Description:                                      | Recycled Aggregate with Black Sand & Clay            | Date Sampled*:         | 20/10/24 |
| Material Source*:                                        | Site Won                                             | Date Received:         | 31/10/24 |
| Particle Density $\text{Mg/m}^3$ :                       | N/A                                                  | Date Tested:           | 07/11/24 |
| Amount Retained on 20mm Sieve:                           | 1%                                                   | Specimen Type:         | Single   |
| Amount Retained on 37.5mm Sieve:                         | 0%                                                   | Rammer Type:           | 2.5kg    |
| As Received Moisture Content (%):                        | 16                                                   | Grading Zone:          | 2        |
| <b>Optimum Moisture Content (%):</b>                     | <b>14</b>                                            | Preparation Procedure: | 3.2.4.2  |
| <b>Maximum Dry Density (<math>\text{Mg/m}^3</math>):</b> | <b>1.85</b>                                          | Sieved On:             | 20mm     |



Certified that the test was carried out in accordance with BS1377-4:1990, Method 3.3

Particle Density not requested therefore Air Void Lines have not been plotted.

Where sampling was not carried out by TD Construction Testing Ltd, the results relate to the sample as received.

This report shall not be reproduced except in full without approval of the laboratory.

Results relate only to the sample tested.

\* Information supplied by client.

Deviations/Comments:

Signed:

J. Wright (Lab Section Manager)

TD Construction Testing Ltd  
Gerard Hall  
40 Lord Street  
St Helens  
Merseyside  
WA10 2SD



8011  
TEST REPORT



T: 01744 734769  
E: [enquiries@tdconstructiontesting.co.uk](mailto:enquiries@tdconstructiontesting.co.uk)

## Plate Loading Test

Test Report No.: TD24-C-07-C-01      Report Date: 17/10/2024

Client: Civil & Remediation

Address: Grosvenor House, 3 Chapel Street, Congleton, Cheshire, CW12 4AB

Contact: Tom Magee

Site: Ardwick Green, Manchester

Test Requested: **Incremental Plate Loading Test**

Test Method: BS1377-9:1990

Material\*: Sand & Gravel

Supplier/Source\*: Site Won

Test Number: 1

Location\*: North Block 1

Test Level: Underside of Foundation Level

Plate Size mm: 300

Date Tested: 17/10/2024

Weather Conditions: Overcast

Tested By: Antonio Vieira

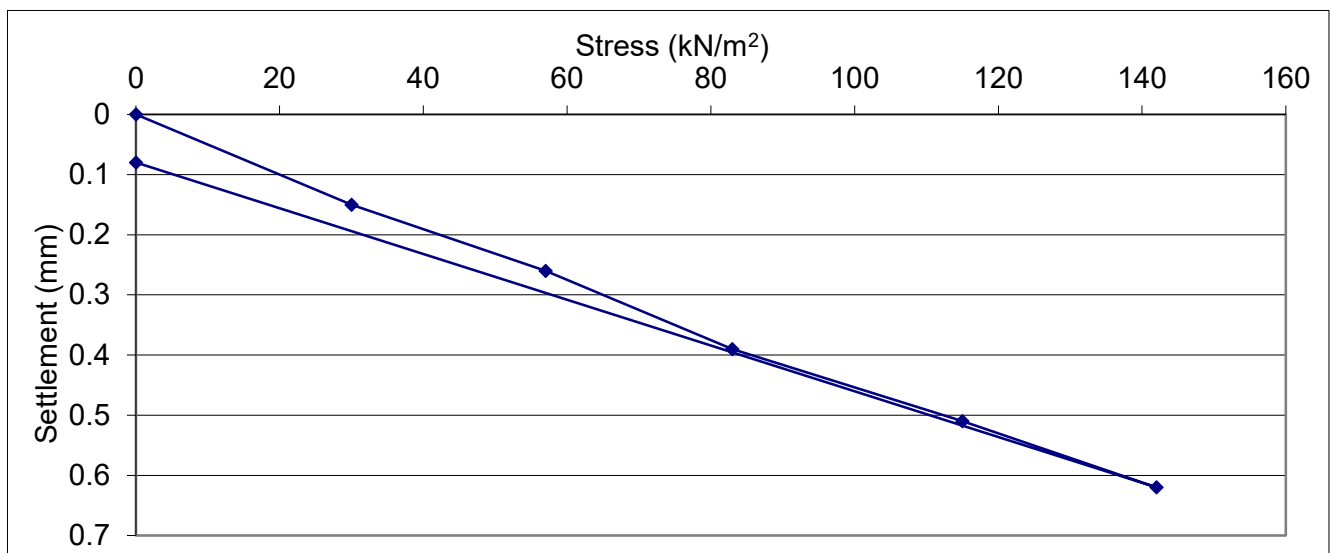
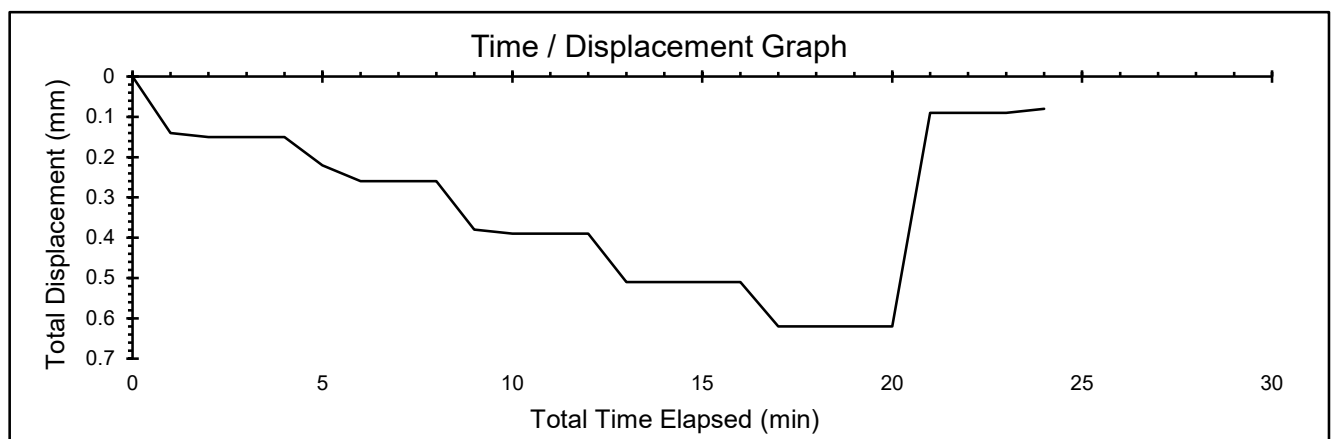
Kentledge Type: Excavator

Comments:

Test Report No.: TD24-C-07-C-01

| Stress (kN/m <sup>2</sup> ) | Settlement (mm) |
|-----------------------------|-----------------|
| 0                           | 0.00            |
| 30                          | 0.15            |
| 57                          | 0.26            |
| 83                          | 0.39            |
| 115                         | 0.51            |
| 142                         | 0.62            |
| 0                           | 0.08            |

|                                  |     |               |      |
|----------------------------------|-----|---------------|------|
| Working Stress kN/m <sup>2</sup> | 142 | Settlement mm | 0.62 |
|----------------------------------|-----|---------------|------|



This report shall not be reproduced except in full without approval of the laboratory.

Results relate only to the location tested.

\* Information supplied by client.

|        |  |                                 |
|--------|--|---------------------------------|
| Signed |  | A. Hayes (Site Section Manager) |
|--------|--|---------------------------------|

TD Construction Testing Ltd  
Gerard Hall  
40 Lord Street  
St Helens  
Merseyside  
WA10 2SD



8011

## TEST REPORT



T: 01744 734769

E: [enquiries@tdconstructiontesting.co.uk](mailto:enquiries@tdconstructiontesting.co.uk)

## Plate Loading Test

Test Report No.: TD24-C-07-C-02

Report Date: 17/10/2024

Client: Civil & Remediation

Address: Grosvenor House, 3 Chapel Street, Congleton, Cheshire, CW12 4AB

Contact: Tom Magee

Site: Ardwick Green, Manchester

Test Requested: **Incremental Plate Loading Test**

Test Method: BS1377-9:1990

Material\*: Sand & Gravel

Supplier/Source\*: Site Won

Test Number: 2

Location\*: North Block 2

Test Level: Underside of Foundation Level

Plate Size mm: 300

Date Tested: 17/10/2024

Weather Conditions: Overcast

Tested By: Antonio Vieira

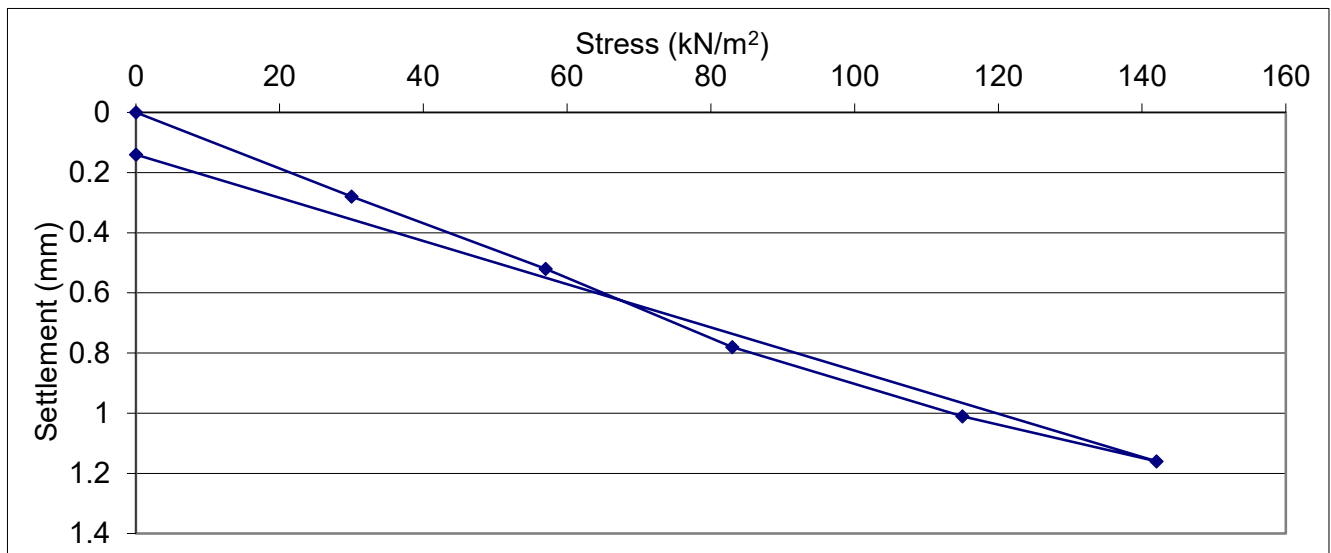
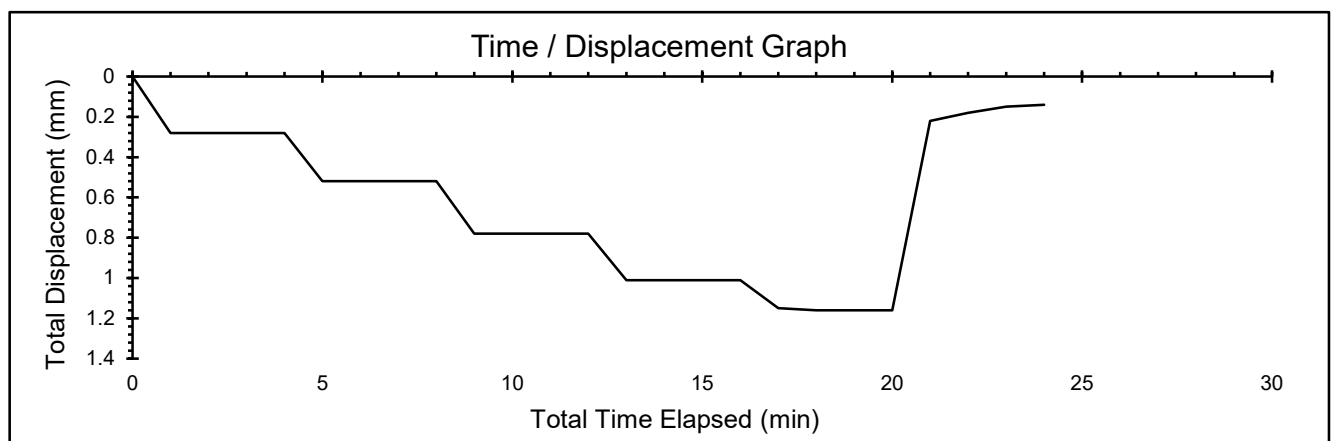
Kentledge Type: Excavator

Comments:

Test Report No.: TD24-C-07-C-02

| Stress (kN/m <sup>2</sup> ) | Settlement (mm) |
|-----------------------------|-----------------|
| 0                           | 0.00            |
| 30                          | 0.28            |
| 57                          | 0.52            |
| 83                          | 0.78            |
| 115                         | 1.01            |
| 142                         | 1.16            |
| 0                           | 0.14            |

|                                  |     |               |      |
|----------------------------------|-----|---------------|------|
| Working Stress kN/m <sup>2</sup> | 142 | Settlement mm | 1.16 |
|----------------------------------|-----|---------------|------|



This report shall not be reproduced except in full without approval of the laboratory.

Results relate only to the location tested.

\* Information supplied by client.

|        |  |                                 |
|--------|--|---------------------------------|
| Signed |  | A. Hayes (Site Section Manager) |
|--------|--|---------------------------------|

TD Construction Testing Ltd  
Gerard Hall  
40 Lord Street  
St Helens  
Merseyside  
WA10 2SD



8011  
TEST REPORT



T: 01744 734769  
E: [enquiries@tdconstructiontesting.co.uk](mailto:enquiries@tdconstructiontesting.co.uk)

## Plate Loading Test

Test Report No.: TD24-C-07-C-03      Report Date: 17/10/2024

Client: Civil & Remediation

Address: Grosvenor House, 3 Chapel Street, Congleton, Cheshire, CW12 4AB

Contact: Tom Magee

Site: Ardwick Green, Manchester

Test Requested: **Incremental Plate Loading Test**

Test Method: BS1377-9:1990

Material\*: Made Ground

Supplier/Source\*: Site Won

Test Number: 3

Location\*: North Block 3

Test Level: Underside of Foundation Level

Plate Size mm: 300

Date Tested: 17/10/2024

Weather Conditions: Overcast

Tested By: Antonio Vieira

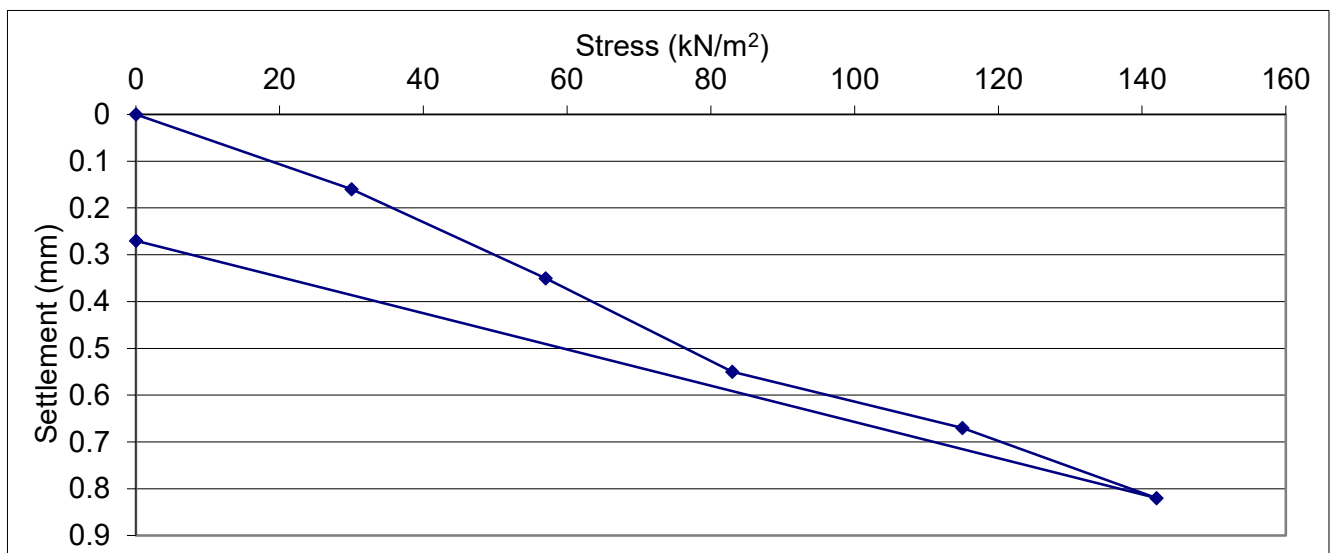
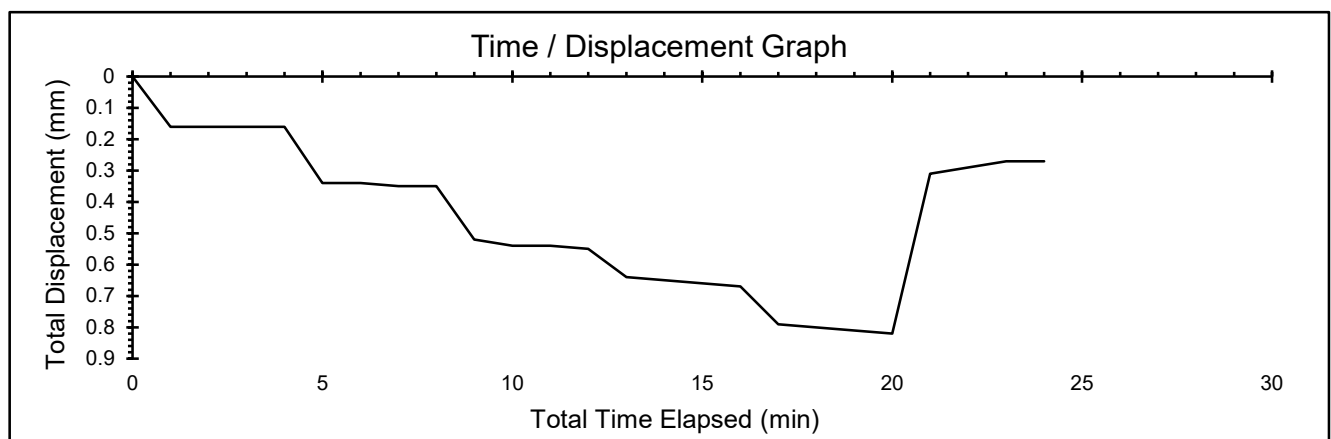
Kentledge Type: Excavator

Comments:

Test Report No.: TD24-C-07-C-03

| Stress (kN/m <sup>2</sup> ) | Settlement (mm) |
|-----------------------------|-----------------|
| 0                           | 0.00            |
| 30                          | 0.16            |
| 57                          | 0.35            |
| 83                          | 0.55            |
| 115                         | 0.67            |
| 142                         | 0.82            |
| 0                           | 0.27            |

|                                  |     |               |      |
|----------------------------------|-----|---------------|------|
| Working Stress kN/m <sup>2</sup> | 142 | Settlement mm | 0.82 |
|----------------------------------|-----|---------------|------|



This report shall not be reproduced except in full without approval of the laboratory.

Results relate only to the location tested.

\* Information supplied by client.

|        |  |                                 |
|--------|--|---------------------------------|
| Signed |  | A. Hayes (Site Section Manager) |
|--------|--|---------------------------------|

TD Construction Testing Ltd  
Gerard Hall  
40 Lord Street  
St Helens  
Merseyside  
WA10 2SD



8011  
TEST REPORT



T: 01744 734769  
E: [enquiries@tdconstructiontesting.co.uk](mailto:enquiries@tdconstructiontesting.co.uk)

## Plate Loading Test

Test Report No.: TD24-C-07-C-04      Report Date: 17/10/2024

Client: Civil & Remediation

Address: Grosvenor House, 3 Chapel Street, Congleton, Cheshire, CW12 4AB

Contact: Tom Magee

Site: Ardwick Green, Manchester

Test Requested: **Incremental Plate Loading Test**

Test Method: BS1377-9:1990

Material\*: Made Ground

Supplier/Source\*: Site Won

Test Number: 4

Location\*: North Block 4

Test Level: Underside of Foundation Level

Plate Size mm: 300

Date Tested: 17/10/2024

Weather Conditions: Overcast

Tested By: Antonio Vieira

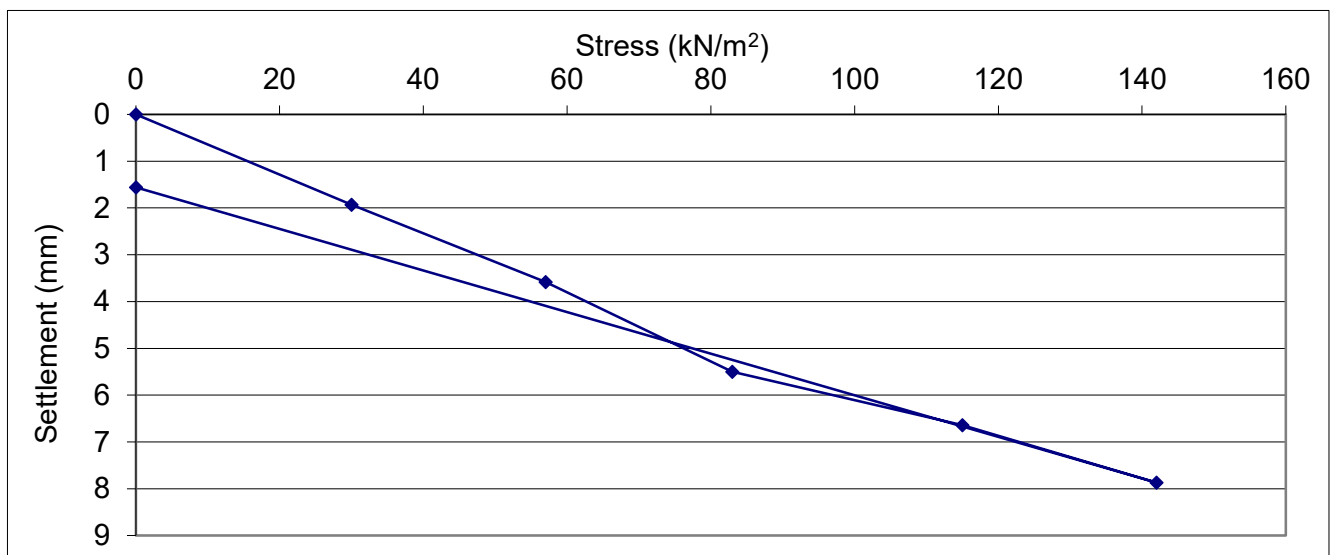
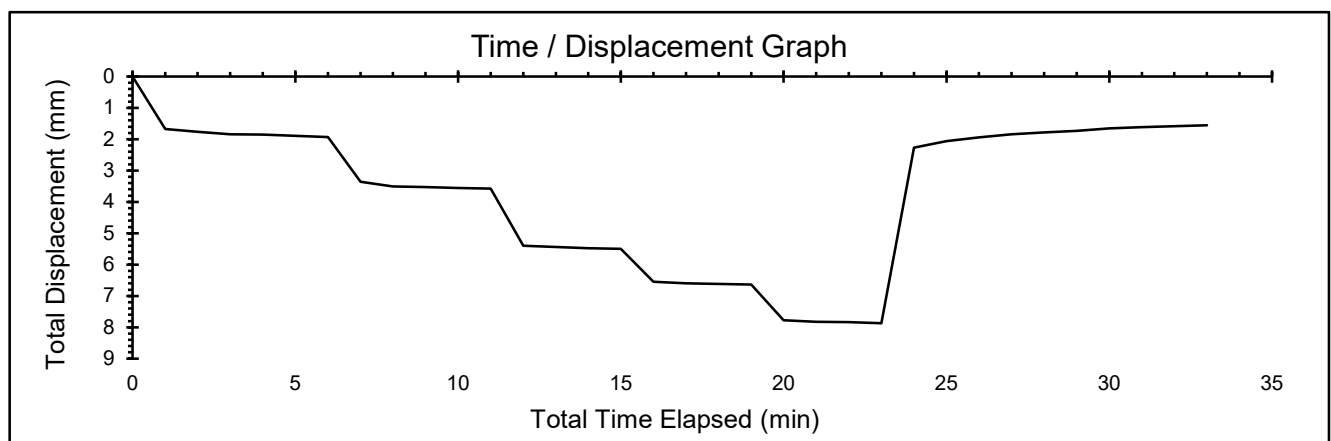
Kentledge Type: Excavator

Comments:

Test Report No.: TD24-C-07-C-04

| Stress (kN/m <sup>2</sup> ) | Settlement (mm) |
|-----------------------------|-----------------|
| 0                           | 0.00            |
| 30                          | 1.93            |
| 57                          | 3.58            |
| 83                          | 5.50            |
| 115                         | 6.64            |
| 142                         | 7.87            |
| 0                           | 1.56            |

|                                  |     |               |      |
|----------------------------------|-----|---------------|------|
| Working Stress kN/m <sup>2</sup> | 142 | Settlement mm | 7.87 |
|----------------------------------|-----|---------------|------|



This report shall not be reproduced except in full without approval of the laboratory.

Results relate only to the location tested.

\* Information supplied by client.

|        |  |                                 |
|--------|--|---------------------------------|
| Signed |  | A. Hayes (Site Section Manager) |
|--------|--|---------------------------------|