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GEO-ENVIRONMENTAL ENGINEERING EXCELLENCE

MORGAN SINDALL

Star Academy, Radcliffe

Earthworks Validation Report – Highways

AH/C5394/14880

May 2026

PROJECT QUALITY CONTROL DATA SHEET

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DRAWINGS

Drawing Number	Rev	Title
C5394/01	-	Site Location Plan
C5394/18	-	Indicative Area Covered by Validation Report AH/C5394/14880
C5394/20	-	CBR Test Location Plan
FS1013-ALA-EX-ZZ-D-L-0001	P02	Whole Site Plan
FS1013-REN-XX-XX-DR-S-04000	P01	Contour & Isopachyte, Existing to Road Formation Levels
FS1013-REN-XX-XX-DR-S-04001	P01	Contour & Isopachyte, Existing to Road Finished Levels
-	-	Star Academy Cut and Fill Heatmap

APPENDICES

Appendix	Title
Appendix A	Site Visit Records
Appendix B	Geotechnical Test Results
Appendix C	Compaction Plant Specification
Appendix D	Soft Spot Removal
Appendix E	Import Delivery Notes

1.0 INTRODUCTION

1.1 Context

This Earthworks Validation Report has been produced by Brownfield Solutions Ltd (BSL) for Morgan Sindall for their Star Academy development in Radcliffe, Manchester as shown on the Site Location Plan, drawing number C5394/01. This report pertains to the highways portion of the earthworks only.

1.2 Objectives

The objective of this report is to provide evidence confirming the completion of earthworks within the highways area shown on the Indicative Area Covered by Validation Report AH/C5394/14880 plan (reference C5394/18), in accordance with the BSL Highways Earthworks Specification (PH/C5394/12388 P01, February 2024).

It should be noted that BSL were appointed to supervise the works on a part time basis only, therefore we can only comment on the works observed during site inspections and the results provided to BSL by the contractor. A E YATES was appointed by Morgan Sindall to carry out the earthworks in the highways areas of the site , with BSL was appointed to ensure compliance with the Earthworks Specification.

1.3 Proposed Development

The proposed development comprised the construction of an access road to the main site as shown on the Whole Site Plan, drawing number FS1013-ALA-EX-ZZ-D-L-0001-S4-P02 provided to BSL by the Client. The extents of the cut zone and fill zone are indicated on the Contour and Isopachyte Plans, drawing numbers FS1013-REN-XX-XX-DR-S-04000-P01 & FS1013-REN-XX-XX-DR-S-04001-P01.

To summarise, the earthworks required cutting of up to approximately 1.5m within the north and south of the area and filling of up to approximately 1.5m within the central and northern portion of the site. Further details are given below.

1.4 Supporting Reports / Specifications

The following reports have been produced for the site and should be read in conjunction with this report, as required:

-
- BSL Highways Earthworks Specification (ref. PH/C5394/12838) dated February 2024.
 - BSL Earthworks Validation Report (ref. PH/C5394/14753) dated November 2025.
-

1.5 Limitations

This report has been carried out based on information obtained from a number of areas, including test results provided by the contractor. BSL have assumed that this information is correct and cannot be held liable for incorrect information.

There may be other conditions prevailing on the site which are outside the scope of work and have not been highlighted by this assessment and therefore not been taken into account by this report. Responsibility cannot be accepted for such site conditions not revealed by the assessment.

BSL were not present on-site full time during filling works, therefore we cannot confirm or warrant that the entirety of the onsite materials and layers placed during our absence on site met the requirements

of the relevant specification, although records and evidence provided indicate a high degree of compliance, with no significant concerns raised by any involved party during the works.

This report has been prepared for the sole use and reliance of the Client, Morgan Sindall. No other third parties may rely upon or reproduce the contents of this report without the written permission of Brownfield Solutions Ltd (BSL). If any unauthorised third party comes into possession of this report, they rely on it at their own risk and BSL do not owe them any Duty of Care.

The site plans enclosed in this report should not be scaled off. Any site boundary line depicted on plans does not imply legal ownership of land.

2.0 METHODOLOGY

2.1 Summary of Works

The BSL Highways Earthworks Specification (Ref. PH/C5394/12838 P01) outlined the requirements for acceptability testing, material placement and compliance testing for the proposed site-won and imported SHW 600 Class 6 fill materials used to achieve the required site levels within the highway area of the development.

This report relates to the works undertaken by A E Yates within this area, located to the south of the main development, as shown on BSL drawing number C5394/18. It should be noted that this report does not include validation of the earthworks undertaken across the main site area by Chartrange in accordance with the general Earthworks Specification (Ref. TM/C5394/12387 Rev A). A E Yates were also responsible for undertaking and/or procuring the in-situ and laboratory compliance testing in accordance with the requirements of the aforementioned Highways Earthworks Specification.

The works were undertaken by A E Yates between 1 May 2025 and 30 July 2025. The earthworks comprised cut and fill operations across the proposed highway areas. Excavation of existing materials was predominantly undertaken within the southern part of the highway area, adjacent to the junction of Spring Lane and the temporary haul road, together with areas towards the north of the site. As detailed below, both site-won and imported SHW 600 Class 6 materials were used to raise levels across the development platform where required.

The installation of geogrid reinforcement within external areas formed part of the coal mining mitigation measures implemented at the site. These works were outside the scope of the Highways Earthworks Specification and are therefore not considered within this report. Similarly, placement of MOT Type material above Earthworks Finished Level (EWFL) as part of the permanent pavement construction, or within service trench installation, is excluded from the scope of this validation report.

2.2 Materials Management Options

The fill was generally placed in accordance with SHW Clause 612, 614, 643 and Appendix 6/1 plus 6/3 with full reference to the guidance from SHW Table 6/4 and 6/5. All material placement was carried out by A E YATES under the guidance of BSL in order to fulfil the appropriate placement criteria.

A Materials Management Plan (document reference TM/C5394/13666 Rev A) is currently in place for the wider site (including the access road), which permits the reuse of suitable site-won soils. The MMP includes the import of 4,107m³ of fills with the highway area and the reuse of site won crushed demolition arisings (volume unspecified within the highway area).

An offsite source of fill was utilised, comprising virgin quarried SHW 600 Class 6 material imported from Fletchers Bank Quarry. A total of 143 loads were delivered to site, equating to approximately 2,860 tonnes of material. Any additional fill requirements were met using material recovered from foundation excavations within the previously placed Class 6 piling mat located in the main development area. Delivery tickets are present in Appendix E.

2.3 Method of Compaction

The fill within the area was deposited and compacted in accordance with Table 6/4, with the methods outlined below:

Compaction Method	Material Class
Method 6	6F2 / 6F5

Where method compaction is adopted, the compacted layer thickness and minimum number of roller passes are determined with reference to the type of compaction plant and SHW600 Table 6/4. A vibratory roller (Bomag 120 AD, 1200mm drum width, 2750kg operating weight) was used, providing a mass per metre width of approximately 1150kg/m. The data sheet is presented in Appendix C.

For this mass category, under Method 6, Class 6F2 and 6F5 materials should be compacted in 110mm thick lifts with a minimum of sixteen passes as per SHW Table 6/4. It is noted that the roller comprised two vibrating drums, each imparting compactive effort; therefore, the specified sixteen passes would typically equate to eight passes of the twin-drum roller.

To the best of BSLs knowledge, the Contractor ensured that each layer that was placed and compacted consisted of the same class of fill material. No significant concerns regarding compaction were noted or raised to BSL during the verification attendances.

The principal compliance requirements for the method compaction were:

Per 500m lift of placed soils and at final formation level:

- Plate bearing tests using a 600mm diameter plate 10m linear intervals of the access road.
 - 100% of results to be CBR >5%.

The specification highlighted the presence of a 250mm diameter PE gas main in close proximity to the works. The associated risks were assessed by others, who specified a maximum allowable settlement of 15mm within any overlying fill materials. It was also noted that any unsuitable made ground in close proximity to the utility, which could not be removed without risking damage to the service, should be proof rolled and the gas undertaker consulted.

It was also noted that where granular made ground was present at formation level, CBR testing should be undertaken to confirm a minimum CBR value of 5%, thereby verifying the suitability and settlement performance of the subgrade.

The results of the in-situ compliance testing are presented in Section 3.

2.4 Method of Laboratory Testing

A E Yates collected and scheduled samples for laboratory testing on behalf of Morgan Sindall. The frequency was outlined within the Specification, and the number of tests performed are summarised below.

The filling programme ran for circa two months, however all of the imported material was bought to site over a 12-day period (17th June to 11th July 2025) with approximately 2860 tonnes of imported material placed. The site-won material from the main development was previously tested and validated within the associated Earthworks Validation Report and as such no additional testing was deemed necessary. Visual inspection of the placed site-won material confirmed it to be generally uniform, with no evidence of excessive fines content or significant deleterious materials such as timber or metallic waste.

Test	Frequency	No. Required	No. Undertaken
Class 6			
Grading	One per 500t and at least one test per two days	24	1
Dry Density / Water Content Relationship	One per 1000t and at least one per two days	24	0
Moisture Content	One per 250t and up to three per week	11	0

Test	Frequency	No. Required	No. Undertaken
Resistance to Fragmentation	Three per source	3	0

The achieved testing frequency for the placed fill does not fully align with the frequency requirements specified within the Earthworks Specification; however, compliance is considered to be demonstrated on a materials performance basis for the following reasons:

Grading

The achieved grading testing frequency did not fully comply with either the specified time-based or tonnage-based requirements. However, the imported material was obtained from a single virgin quarried source and manufactured to the required specification, and as such the reduced testing frequency is not considered to materially affect confidence in the consistency or suitability of the material.

The available grading results confirm that the material conforms to the required SHW 600 classification. In addition, visual inspection of the placed material confirmed it to be generally uniform and well graded, with no evidence of excessive fines content, segregation, degradation or significant deleterious materials such as timber or metallic waste. The material comprised quarried and crushed granular fill, which is inherently consistent and quality controlled at source.

Dry Density / Moisture Content Relationship (DD/MC) & Moisture Content (MC)

MC and DD/MC testing was specified within the Earthworks Specification; however, in-situ density testing was not adopted as part of the validation methodology and therefore the absence of density and moisture-based correlation is not considered an issue in the context of the adopted compliance approach. Validation of the placed fill has instead been undertaken using CBR testing, supported by visual assessment of placement conditions.

During construction, the material did not appear excessively wet, and no evidence was observed of pumping or instability that would indicate adverse moisture condition effects. The observed in-situ behaviour is considered consistent with adequately compacted fill.

Resistance to Fragmentation

The material was imported from a single virgin quarried source and therefore subject to controlled production, processing and quality assurance prior to delivery, reducing the potential for variability or degradation. The proposed end-use beneath road construction further limits the likelihood of significant particle breakdown in service. Visual inspection during placement did not indicate any observable degradation of aggregate structure, segregation, or grading breakdown.

The Geotechnical Laboratory Testing Results are presented in Appendix B.

2.5 Method of Field Testing

A E Yates arranged for in-situ compliance testing to be carried out during the works in line with the Specification. A total of 28 No. plate load tests (PLTs) were undertaken on a 10m linear grid across the area (every 500mm lift and at EWFL). The testing locations are appended. These tests included 3 No. retests in instances where the required CBR was not originally achieved.

The purpose of the plate load testing was to obtain equivalent CBR values, to confirm that the minimum 5% requirements outlined in the Specification had been met.

3.0 VERIFICATION

3.1 Soft Spot Removal

A localised soft spot was identified within the northern part of the works area during construction. The unsuitable material was excavated and replaced with SHW 600 Class 6 fill, which was subsequently compacted and tested in accordance with the specification requirements (see Appendix D).

3.2 Site Attendances

BSL visited site on the following occasions to check on general progress and ensure works were being undertaken in general compliance with the Earthworks Specification. A watching brief for contamination and remedial supervision was completed alongside the watching briefs for the earthworks validation. The verification of the remedial works are details in a separate report. A summary of the site visits is tabulated below:

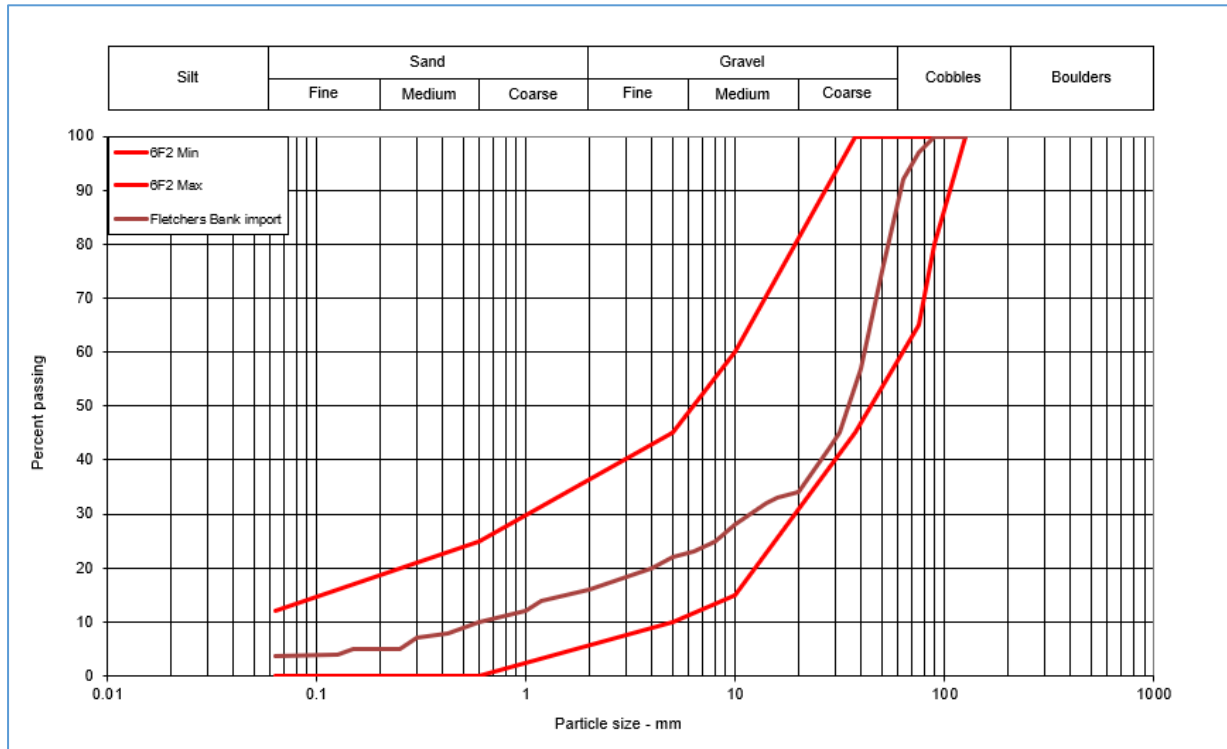
Date	Purpose	Comments
24/03/2025	Initial site meeting with A E Yates regarding the earthworks specification in the highways area.	Clean quarried MOT material to be imported from Travis Perkins. To progress with the highways earthworks in circa seven weeks. Confirmed CBR testing at formation level would likely be required if granular made ground is present.
08/04/2025	Site meeting to discuss highways earthworks testing.	MOT type 1 will be imported to be used as fill. Made ground stockpile currently on the highways area. Reiterated to the contractor that the testing frequencies within the Specification should be adhered to.
15/04/2025	Watching brief	Drainage installation in progress.
24/04/2025	Watching brief	Drainage installation in progress.
07/05/2025	Watching brief	In situ CBR tests to be undertaken. Reiterated to the contractor that the testing frequencies within the Specification should be adhered to.
08/05/2025	Watching brief	Drainage excavation being undertaken along the access road.
22/05/2025	Watching brief	Progressing with the access road drainage.
29/05/2025	Watching brief	Progressing with access road drainage installation utilising imported quarry MOT around services.
11/06/2025	Watching brief	The site won 6F2 (generated from piling mat and footing crush) has been used to build up the access road, further 6F2 will need to be imported. CBR tests complete on the first level of fill on the access road.
17/06/2025	Watching brief	Services and service entries around the access road have been excavated and installed.
02/07/2025	Watching brief	Highways earthworks have been built up, all CBR tests have been undertaken, commencing with the geogrid installation south of the roundabout, awaiting imported MOT.
10/07/2025	Watching brief	Geogrid installed and imported quarried MOT has been placed.
30/07/2025	Watching brief	Final 3 No. of plate load tests were completed in the southern section of the access road.

As previously stated, BSL were not present onsite full time during filling works, therefore we cannot fully confirm or warrant that all layers placed during our absence met the above listed requirements. However, to the best knowledge of BSL, the Contractor ensured that each layer that was placed and compacted consisted of the same class of fill material and was of the correct thickness for the compaction plant in use.

The site visit records and the earthworks contractor daily records are presented in Appendix A.

3.3 Material Classification

Particle size distribution testing was undertaken on one sample of the imported fill. As shown in the below graph this fits the required SHW Class 6F2 classification.



The classification results are presented in Appendix B at the rear of this report.

3.4 Validation Test Results

The in-situ test results provided as part of the validation of the earthworks are summarised in the table below. The results are provided in Appendix B.

Test	Criteria	Result Range	No. non-compliances	Compliant (Y/N)
In situ PLTs – CBR (%)	>5%	1.6-24.0	3 / 28	Y

As detailed previously the areas not meeting the required CBR were recompacted or removed, filled and compacted in line with the Specification. The re-tests of fill all met the required CBR.

No further information has been provided regarding the location of the existing gas main, however, the settlements recorded during the plate load testing were all below the 15mm specified.

Granular made ground was encountered at formation level within the southern half of the site. Where testing was undertaken directly at formation level, CBR values in excess of 5% were confirmed. In areas where direct formation level testing was not undertaken, the CBR testing carried out on the first lift of placed fill would also have assessed the underlying formation due to the influence depth of the 600mm diameter plate, which extends to approximately 1.8m below the test level. These tests also confirmed CBR values in excess of 5%.

3.5 Waste

Removal of waste materials (including Class U) from site is detailed under separate cover as part of the Remediation Validation Report.

4.0 SUMMARY

Based on the available site records, laboratory testing, in-situ validation testing and BSL site inspections, the earthworks within the validated highways area are considered suitable for the proposed development and generally compliant with the intent of the Earthworks Specification.

Although some aspects of the laboratory testing frequency did not fully comply with the specified requirements, the placed fill comprised material imported from a single virgin quarried source manufactured to the required specification. The available grading results confirmed compliance with the required SHW 600 classification, whilst visual inspections identified no evidence of excessive fines, segregation, degradation or significant deleterious materials.

Validation of the placed fill was undertaken principally through plate load testing, with all areas ultimately achieving the specified minimum equivalent CBR requirement following localised remediation and recompaction where required. Accordingly, the identified testing non-conformances are not considered to have adversely affected the performance or suitability of the placed fill materials.

Note BSL were present onsite on a part time basis and have undertaken this report utilising geotechnical testing provided to BSL, in addition the volumes of imported materials are estimated values and may therefore have some inaccuracies in the required testing.

Should ground conditions during the construction phase differ to those discussed in this report, then BSL should be contacted for advice.

DRAWINGS

Link to the relevant drawings is presented below:

[Drawings](#)

APPENDIX A

Site Visit Records

Link to all Site Visit Records is presented below:

[A Visit Records](#)

Should this link not work then please contact BSL.

APPENDIX B

Geotechnical Test Results

Link to all geotechnical test results is presented below:

[B Geotech Results](#)

Should this link not work then please contact BSL.

APPENDIX C

Compaction Plant Specification

Link to all compaction plant specification documents is presented below:

[C Plant Spec](#)

Should this link not work then please contact BSL.

APPENDIX D

Soft Spot Removal

Link to the relevant plans is presented below:

[D Soft spot](#)

Should this link not work then please contact BSL.

APPENDIX E

Delivery Notes

Link to the delivery notes is presented below:

[E Delivery notes](#)

Should this link not work then please contact BSL.

APPENDIX F

Geogrid Specification and Certificates

Link to all Geogrid specification and certificate documents are presented below:

[Geogrid Specification and Certificates](#)

Should this link not work then please contact BSL.

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