

Environmental
Geotechnical
Specialists

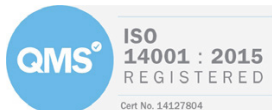


PHASE 4 VALIDATION REPORT

job number	C3757/23/E/7070	date	11.09.2024
site address	Manchester Metropolitan University Lower Ormond Road, Manchester M15 6BX		
written by	S. Alexander	checked by	R. Palmer
issued by	S. Alexander		



Please consider the environment before printing this report.



Environmental
Geotechnical
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Rogers Geotechnical Services Ltd
Offices 1 & 2 Barncliffe Business Park, Near Bank, Shelley, Huddersfield, HD8 8LU
☎ 01484 604354 Company No. 5130864

<ENVIRONMENTAL> <GEOTECHNICAL>

Phase 4: Validation Report Of Remediation

Location: Manchester Metropolitan University
Lower Ormond Road, Manchester, M15 6BX.

For: P Casey and Co. Limited

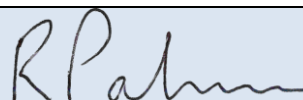
Report No. C3757/24/E/7070

Report date: September 2024

For and on behalf of **Rogers Geotechnical Services Ltd**



Scott Alexander BSc, FGS
Senior Geo-environmental Engineer



Rob Palmer MSc FGS ACIEH
Engineering Director

1. Introduction

It is understood that the footpaths around the open courtyard area at Manchester Metropolitan University have been laid and remediation has been completed. It was considered that remediation was required to remove some contamination encountered during construction works. It is understood the entirety of the area is to be developed with replacement of the existing hardstanding.

In order to fully discharge a planning condition relating to land contamination, a verification report has been produced to demonstrate that the required depth of cover has been achieved and that the specification for designs have been followed.

This report has been produced on the understanding that a Remediation Statement has been submitted and agreed with the local planning authority.

2. Review of the Proposed Remediation Strategy

2.1 Summary of Contamination Risks

A review of the findings of the testing was presented in the remediation report C757/24/E/6619 which indicated that several locations required remediation due to posing a risk to human health.

2.2 Proposed Remediation Strategy

As part of the remediation strategy which has been proposed in accordance with the design specification drawing, 075050-CUR-00-XX-DR-75001_C01_Pavement Details for the replacement of the footpath.

The general layout of the site including the area where hazardous materials have been identified and the proposed areas for remediation can be found within the site plan presented in Appendix 1. In addition, the following should also be noted.

- The entirety of the site is to be completely replaced with a footpath comprising the following composition:
 - Reduced to 495mm below finished levels and dressing.
 - Placement of 230mm of Type 1 unbound sub-base and compacted in line with series 800.
 - Construction of 150mm thick concrete base course.
 - Placement of 40mm bedding mortar course.
 - Construction of 75mm thick surface flag paving.
- The guidance within the remediation strategy states that a minimum of 400mm thickness of clean cover shall be required.

2.3 Sources of Material

For cover and containment systems, verification will normally depend upon the provision of defensible measurements, observations and records. The following table provides information in regards to the source and characteristics of the material used within the remediation process.

Table 1: Validation Sampling and Testing		
Type of Material	Source of Material	Volume of imported Material
Type 1 SHW 803	Directly supplied from commercial quarry and placed in excavation. Marchington Stone Ltd. Buxton Road, High Lane, Stockport, SK16 8DX	100m ³

3. Limitations

The recommendations made and opinions expressed in this report are based on the ground conditions revealed by the site works, together with an assessment of the site and of the laboratory test results. Whilst opinions may be expressed relating to sub-soil conditions in parts of the site not investigated, for example between investigatory positions, these are for guidance only and no liability can be accepted for their accuracy.

This report has been prepared in accordance with our understanding of current best practice. However, new information or legislation, or changes to best practice may necessitate revision of the report after the date of issue.

4. Validation

Validation of the placement of materials was undertaken alongside construction works, photographs from each stage of works are presented in Appendix 2 to this report. During site activity a watching brief with a PID monitor was employed to continuously monitor the atmosphere to determine presence of hazardous vapours. No recordings of vapours were recorded during any of the site works.

The site was observed reduced to formation level, in Photograph 1 some of the relict contaminated made ground can be observed as a dark grey to black material.

Photograph 2 shows the placement of the Type 1 material to act as sub-base, placed in two separate layers. This material was imported direct from Marchington Stone Quarry and placed in line with the specification of works. This was inspected to prior to placement and no obvious visual or olfactory contamination was observed in addition no readings were recorded on samples selected for headspace testing using a PID monitor.

Photograph 3 shows the placement of the concrete base to act as a reinforcement course to the paving surface, and Photograph 4 shows the final construction of the footpath.

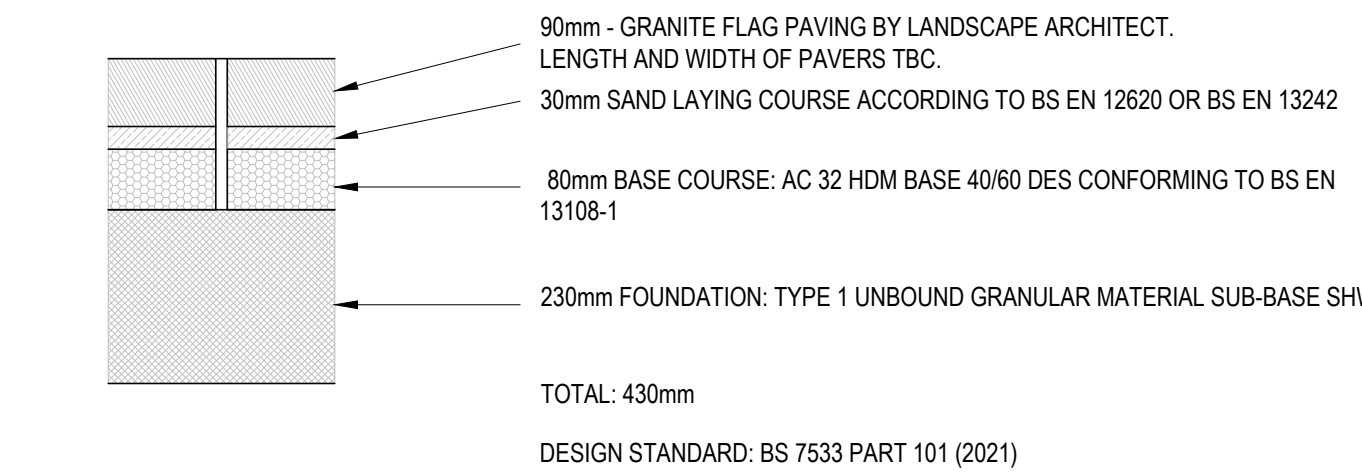
It is considered that the site has been suitably remediated to remove the pathway of contaminated material which was proven beneath the site. Photograph 1 shows that the material had been removed to a suitable depth and photographs 2, 3, and 4 indicate that this material has been suitably encapsulated beneath a permanent hardstanding. In addition to this a concrete screed reinforcement has been placed to support the road which will permanently fully sever any pathways from the surface and no further action is required.

5. References

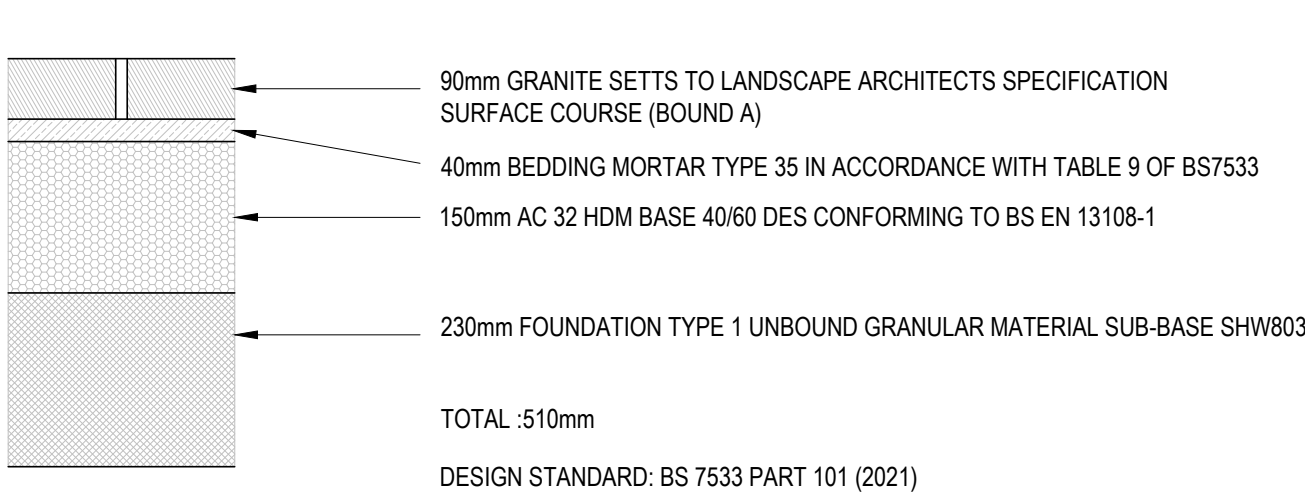
- Department for Environment, Food and Rural Affairs and the Environment Agency (2009) DEFRA Science Report – Final SC050021/SR2, *Human Health toxicological assessment of contaminants in soil*. Environment Agency, Bristol.
- Department for Environment, Food and Rural Affairs and the Environment Agency (2009) DEFRA Science Report – SC050021/SR3, *Updated technical background to the CLEA model*. Environment Agency, Bristol.
- WS Atkins plc, 2011, Soil Screening Values, Derived using CLEA v1.04 and January 2009 Guidance: SSVs derived using CLEA v1.04 for 6% SOM, Residential with home grown produce land use.
- YALPAG *Technical Guidance for Developers, Landowners and Consultants – Verification Requirements for Cover Systems V3.3* Appendix 1a, October 2016.
- Standards for Highways, Manual of Contract Documents for Highways Works Amendment, *Series 800 Road Pavements – Unbound, Cement and other Hydraulically Bound Mixtures*, amendment November 2021.

Appendix 1

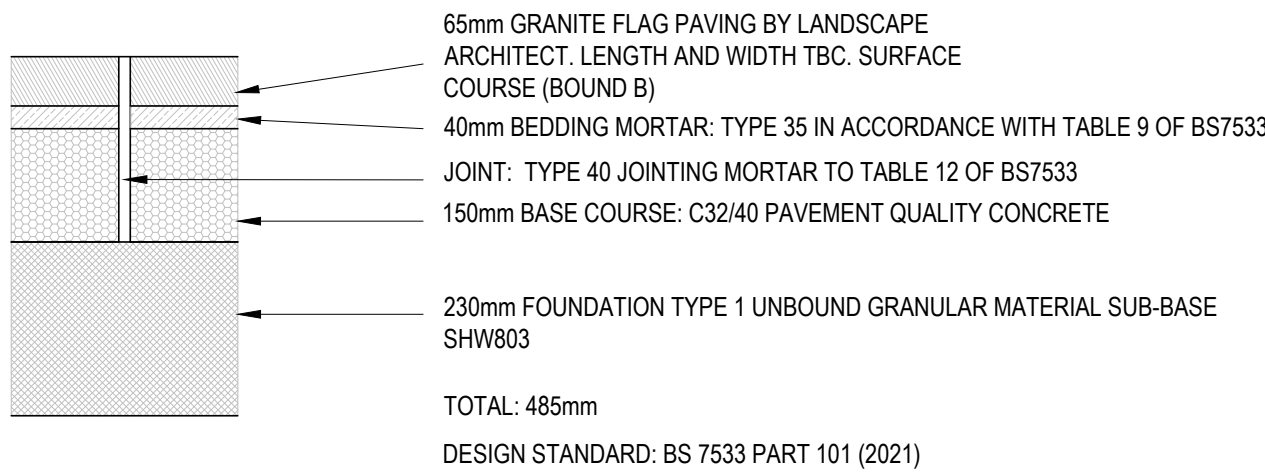
Site Plan



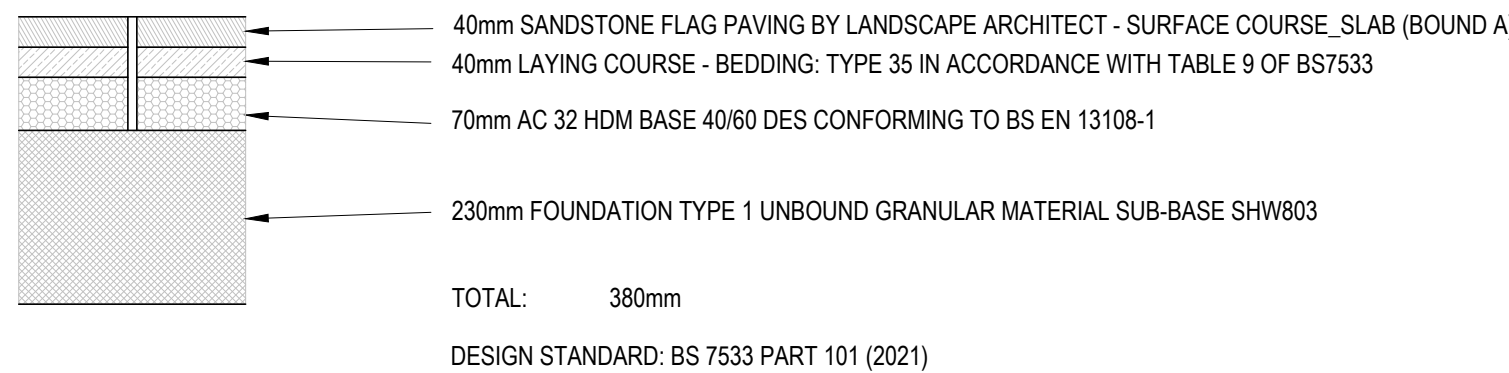
PAVEMENT P1a (VEHICLE DESIGN CATEGORY 5). NATURAL STONE PAVING
(Scale: 1:10)



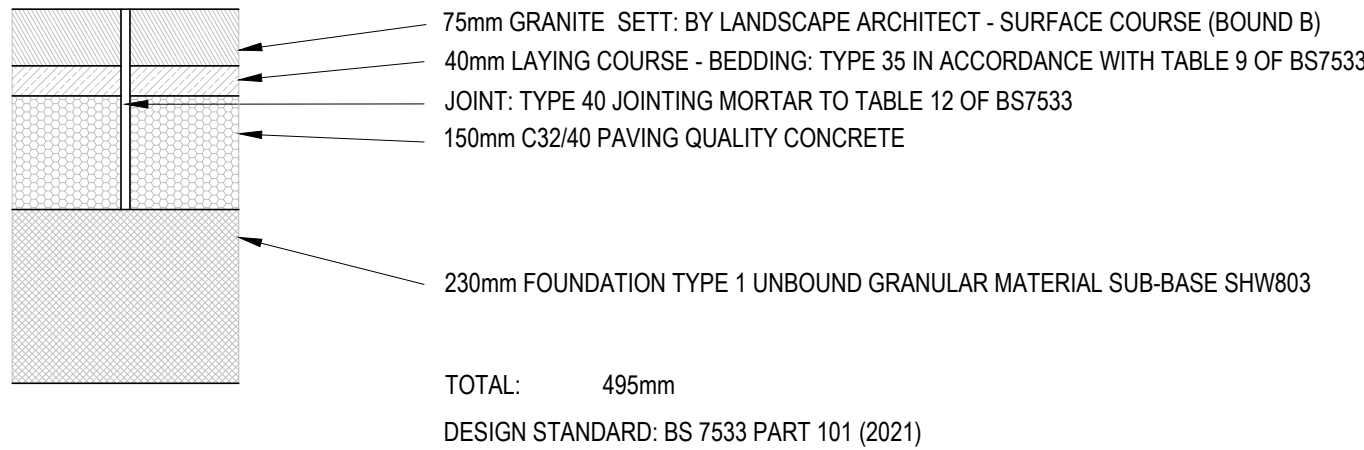
PAVEMENT P2 (VEHICLE DESIGN CATEGORY 6). NATURAL STONE PAVING
(Scale: 1:10)



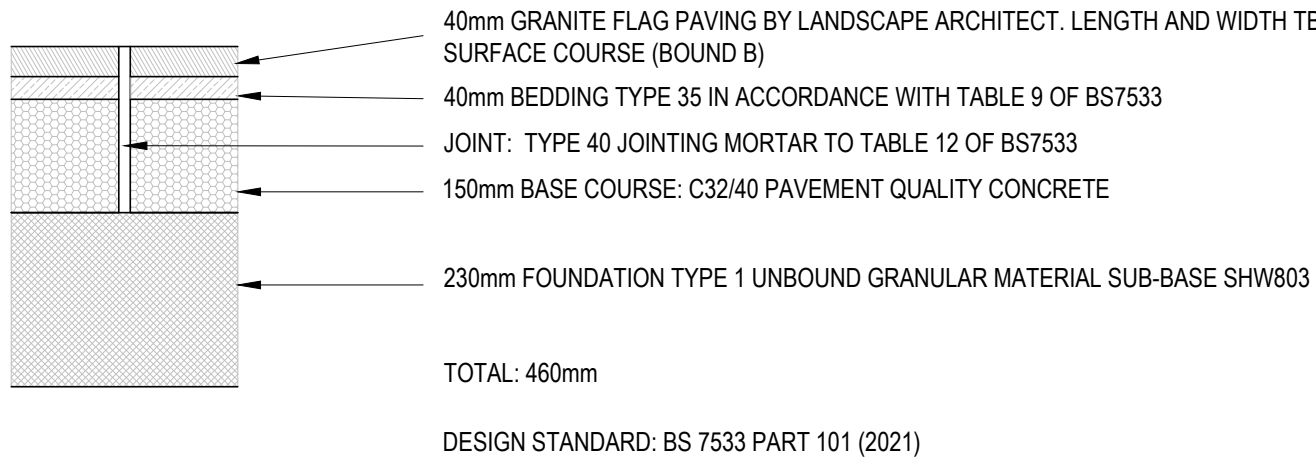
PAVEMENT P1b (VEHICLE DESIGN CATEGORY 6) NATURAL STONE PAVING
(Scale: 1:10)



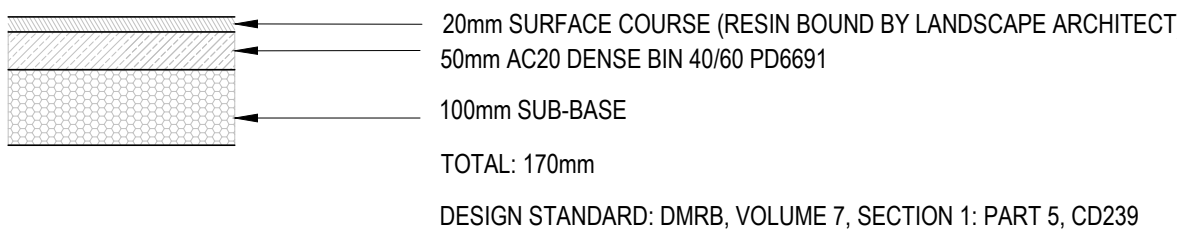
PAVEMENT P5 (VEHICLE DESIGN CATEGORY 2) SANDSTONE FLAG PAVING
(Scale: 1:10)



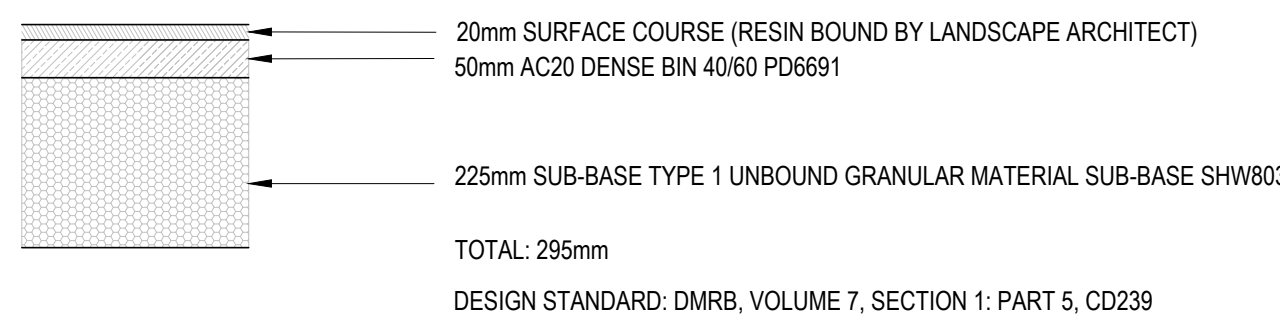
PAVEMENT P6 (VEHICLE DESIGN CATEGORY 6) YORKSHIRE STONE FLAGS
(Scale: 1:10)



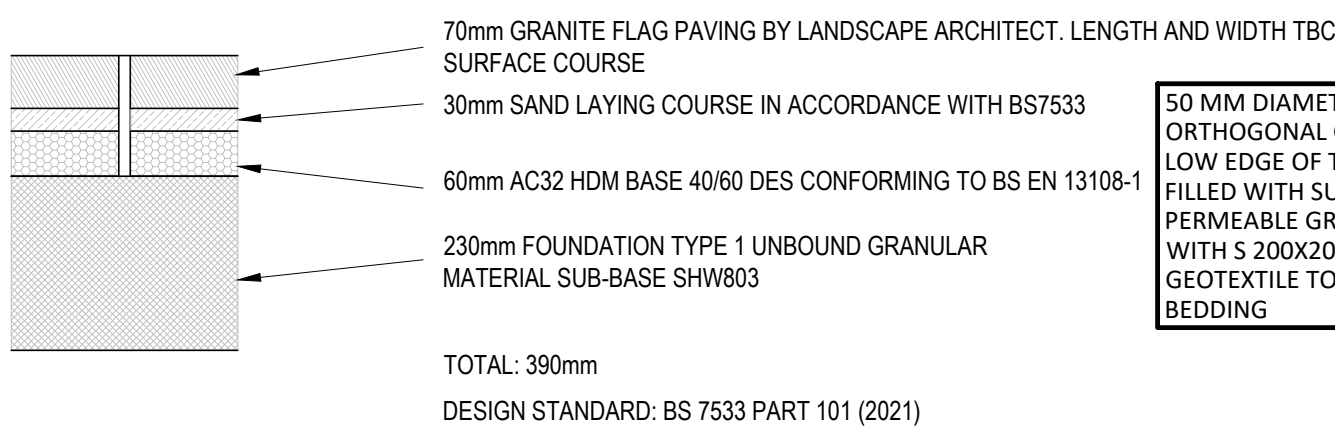
PAVEMENT P1c (VEHICLE DESIGN CATEGORY 4) NATURAL STONE PAVING
(Scale: 1:10)



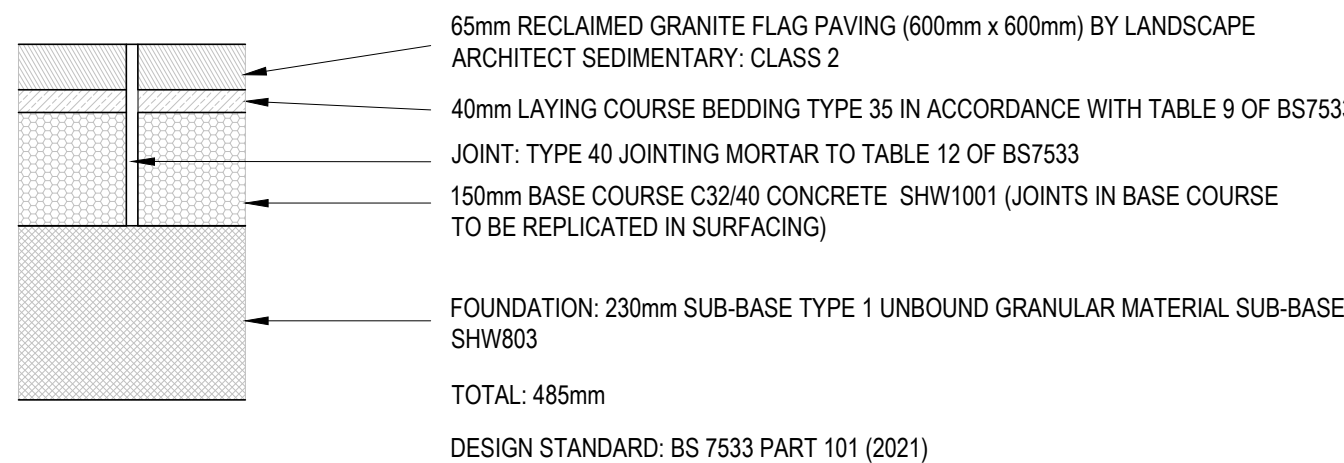
PAVEMENT P7a (TRAFFIC CATEGORY 2) RESIN BOUND GRAVEL
(Scale: 1:10)



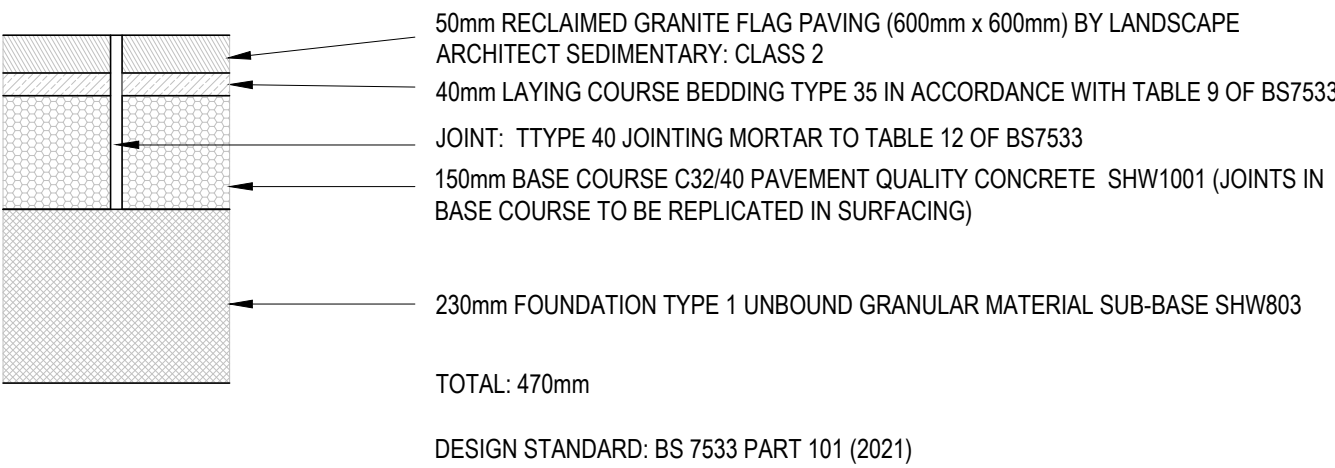
PAVEMENT P7b (VEHICLE DESIGN CATEGORY 4) RESIN BOUND GRAVEL
(Scale: 1:10)



PAVEMENT P1d (VEHICLE DESIGN CATEGORY 4, UNBOUND) NATURAL STONE PAVING
(Scale: 1:10)



PAVEMENT P9b (VEHICLE DESIGN CATEGORY 6) NATURAL STONE PAVING - RECLAIMED S278/ADOPTED AREAS
(Scale: 1:10)



PAVEMENT P9a (VEHICLE DESIGN CATEGORY 5) NATURAL STONE PAVING - RECLAIMED, UNADOPTED PARK AREAS
(Scale: 1:10)

GENERAL NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
- ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
- FOR GENERAL NOTES REFER TO DRAWING REFERENCE 075050-CUR-XX-XX-DR-D-72101.
- FOR PAVEMENT EXTENTS AND LOCATIONS REFER TO PLANIT I.E DRAWING REFERENCE 1958-PLA-01A-XX-DR-L-1000
- FOR MOVEMENT JOINT LOCATIONS AND DETAILS, REFER TO DRAWINGS 075050-CUR-01-XX-DR-D-75002, -75003 and 75004.
- ALL MATERIAL WITHIN 450mm OF FINISHED SURFACE TO BE NON FROST SUSCEPTIBLE.
- ROAD FORMATION TO BE CHECKED FOR SOFT SPOTS. SOFT SPOTS TO BE REMOVED AND REPLACED WITH TYPE 1 MATERIAL OR TYPE 6F2 CAPPING MATERIAL.
- CBR VALUES ON SITE TO BE CONFIRMED AT THE PROPOSED FORMATION LEVEL, PRIOR TO FINAL DESIGN AND CONSTRUCTION. REPORT RESULTS TO THE ENGINEER AND ALLOW 5 WORKING DAYS FOR UPDATES, IF REQUIRED.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION UNUSUAL SIGNIFICANT HAZARDS

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT. IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING:

CONSTRUCTION
1. CONTRACTOR TO ENSURE SITE IS SCANNED FOR EXISTING SERVICES THAT MAY BE ON SITE.
2. CONTRACTOR TO ASSESS FOR GROUND CONTAMINATION.
3. CONTRACTOR TO ENSURE SUITABLE MEASURES ARE TAKEN DURING ANY EXCAVATIONS/TEMPORARY WORKS.
4. A SUITABLE TRAFFIC MANAGEMENT PLAN SHOULD BE IN PLACE FOR DURATION OF WORKS.
NOTE: CURTINS ARE NOT LIABLE FOR ANY OF THE ABOVE.

MAINTENANCE / CLEANING
1. WHERE PROPRIETARY PRODUCTS ARE SPECIFIED, THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS SHOULD BE FOLLOWED.
3. THE RECOMMENDED INSPECTIONS OF OPERATIONS AND FREQUENCIES ARE TYPICAL ONLY AND SHOULD BE MORE FREQUENT INITIALLY TO ENSURE THAT THERE ARE NO UNFORESEEN ISSUES WITH THE OPERATION AND THEN ADJUSTED TO SUIT THE SITE REQUIREMENTS.

DECOMMISSIONING / DEMOLITION
1. N/A
2.
3.

RESIDUAL HAZARD REGISTER (RELATES TO CIVIL/STRUCTURAL MATTERS ONLY)
MUST BE READ IN CONJUNCTION WITH CURTINS RESIDUAL HAZARD REGISTER -075050-CUR-00-XX-HA-X-10001.
HAZARDS THAT SHOULD BE OBVIOUS TO A COMPETENT CONTRACTOR HAVE NOT BEEN INDICATED ON THIS DRAWING. SHOULD ANY ADDITIONAL HAZARDS BE IDENTIFIED, THE CONTRACTOR SHOULD NOTIFY ALL RELEVANT PROJECT TEAM MEMBERS.

HAZARD REF No.	ITEM (FEATURE, ELEMENT OR ACTIVITY)	RESIDUAL HAZARD
	Underground Services	GPR Survey has been commissioned and is currently underway
	Ground Conditions	Currently unknown

C01	CONSTRUCTION ISSUE	09/05/23	CS	MW
P09	UPDATED TENDER	20/01/23	KS	SR
P08	TENDER	21/01/22	TH	AR
P07	PAVEMENT CONSTRUCTION P10 REMOVED	02/12/20	AR	AR
P06	ALL SAINTS PAVEMENT CONSTRUCTION ADDED	15/10/20	AR	AR
P05	PAVEMENT CONSTRUCTION 4A & 4B REMOVED	16/9/20	AR	AR
P04	UPDATE TO PAVEMENT P1 CONSTRUCTION	06/08/20	AMG	AR
P03	UPDATE TO P1 ie LATEST INFORMATIN	30/03/20	AMG	AR
P02	ISSUED FOR CO-ORDINATION	04/03/20	AMG	AR
P01	ISSUED FOR CO-ORDINATION	03/03/20	AMG	AR
Rev:	Description:	Date:	By:	Chkd:



Civils & Structures • Transport Planning • Environmental • Infrastructure • Geotechnical • Conservation & Heritage • Principal Designer
Birmingham • Bristol • Cambridge • Cardiff • Douglas • Dublin • Edinburgh • Glasgow • Kentish • Leeds • Liverpool • London • Manchester • Nottingham

Status: CONSTRUCTION S5

Project: MMU PUBLIC REALM MASTER PLAN

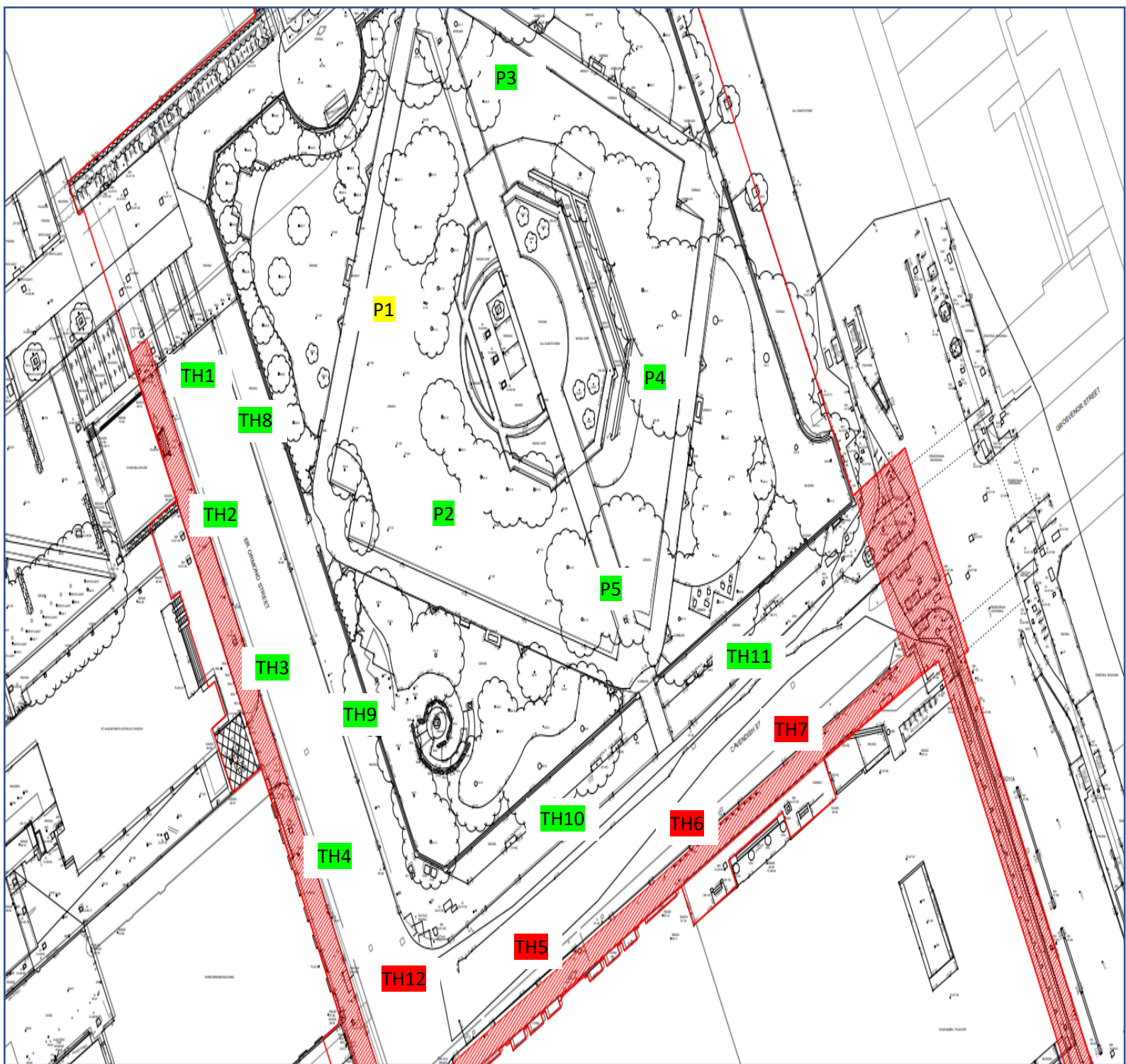
Orig Title: PAVEMENT BUILD UPS

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	20/01/2023	KS	SB	AR

Scale:	1:10
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Project No:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
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075050 - CUR - 00 - XX - DR - D - 75001 - C01



TH 1,2,3,4 formation 510mm, - existing, Tarmac 90mm, concrete 300mm, subsoil/6f2, mot 120mm.

TH 5,6,7,12 formation 510mm, - existing, Tarmac 80mm, Stone sets 160mm, subsoil 260mm (**hazardous**)

TH 8,9 formation 460mm, - existing, York stone 80/120mm lift and save for relaying, subsoil 360mm.

TH 10,11 formation 390mm, - existing, York stone 80/120mm lift and save for relaying, subsoil 290mm.

P1 possible hazardous

P2,3,4,5 ok

Appendix 2

Site Photographs



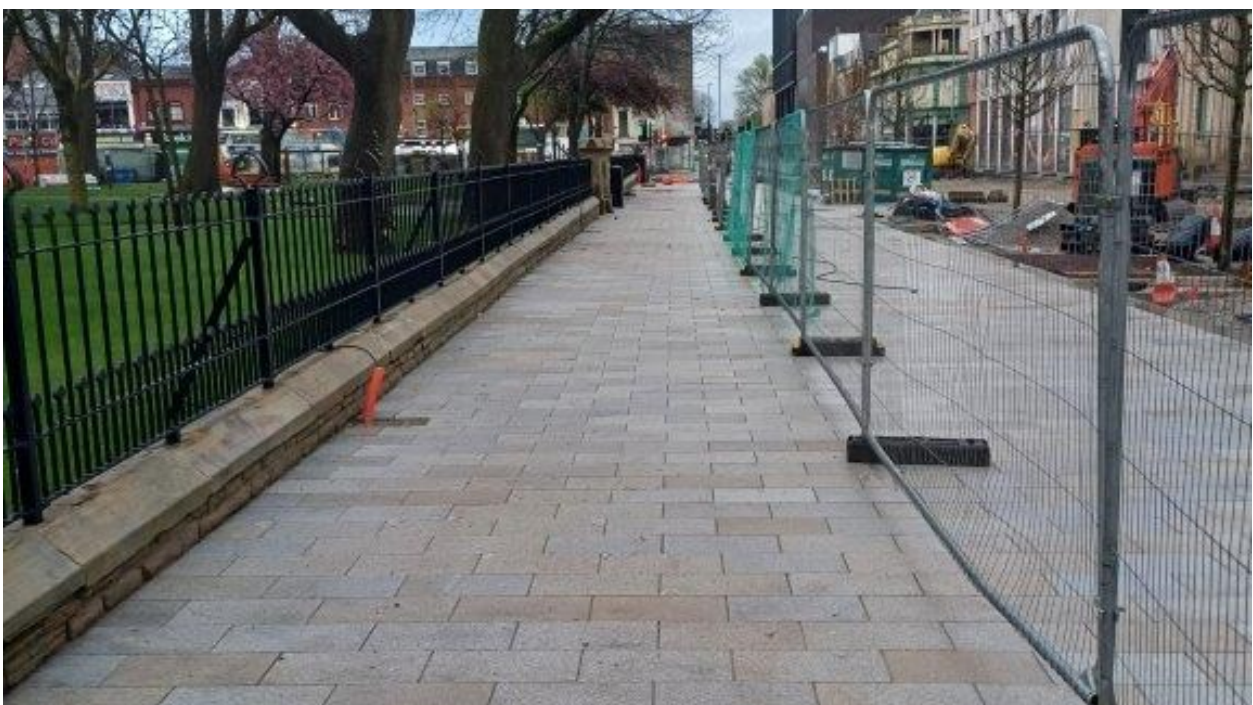
Photograph 1: Photograph of footpath reduced to formation level. Dark grey and black colouration of gravel denotes area of observed contamination to be remediated.



Photograph 2: Photograph of stone being delivered to site and laid in accordance with series 800.



Photograph 3: Construction of concrete base course place on top of type 1 and residual contamination fully encapsulated



Photograph 4: Photograph of completed construction with new permanent hardstanding footpath.



Rogers Geotechnical Services Ltd

Offices 1 & 2, Barncliffe Business Park,
Near Bank, Shelley,
Huddersfield,

Job No:

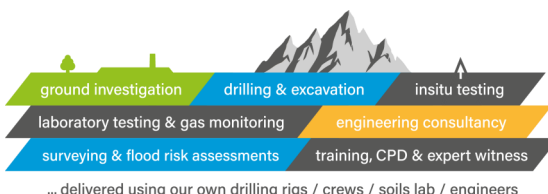
C3757/24/E/7070

Site:

Manchester Metropolitan
University,
Lower Ormond Street,
Manchester,
M15 6BX

Client:

P Casey and Co Limited.



Appendix 3

PID Monitor Calibration Document



Certificate of Calibration

Customer: Rogers Geotechnical

Instrument: MiniRAE 3000

Job: Service, Test & Calibration

Serial number: 592-932847

Fleet Number: -

Certificate no: 932847/050723

Next calibration due date: 05.JUL.2024

Tested on: 05.JUL.2023

Calibrated for: Isobutylene

<u>Applied Gas Concentration:</u>	<u>Cylinder Reference:</u>	<u>Final Sensor Reading</u>	<u>Accuracy Limits</u>	<u>Pass / Fail</u>
Isobutylene: 100ppm	63098/1423	100.6ppm	± 10%	Pass

The instrument has been calibrated after re-zeroing and introducing span calibration gas, using gas that is traceable to national standards and has been prepared in accordance with BS EN ISO 6145-6:2017

Calibration Engineer: Dan Jacques

Sign:

Quality Assessed by (Print):	C.S.	Sign:	
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