

Temporary Works Design & Check Certificate



Project	The Natural History Museum		
Temporary Works Reference No.	TW1870.01	Category	2
For	MACE		

Description of Temporary Works:

Haul Road Design

I certify for and on behalf of Bridges Pound Ltd that in my opinion, the erection proposals and proposed temporary works details specified in the schedule attached hereto relating to the construction of the above contract are satisfactory for the proper discharge of responsibilities for the safe temporary works design elements of the works and for their safe execution and removal (if applicable) in accordance with the drawings and specification and without detriment to the related permanent Works.

Schedule of Drawings and other Documents:

Temporary haul road for construction of The Natural History Museum

Special Requirements or Restrictions:

Provide the following design:

- 135mm macadam, in layers of 75mm and 60mm
- 410mm compacted Type 1 sub-base as per the specification on the following pages.

A Geotextile separator should be provided between the capping material and the subgrade.

Site to confirm site investigation results once carried out to verify design.

Designed By:

Checked By:

Signed	<i>Chris Brown</i>	<i>A Goddard</i>
Name	Chris Brown	Anne Goddard
Qualifications	BSc	B.Eng (Hons) C.Eng. M.I.Struct.E.
Date	28/03/2024	28/03/2024
From	Bridges Pound Ltd.	Bridges Pound Ltd.

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Design Risk Assessment

Risk assessment carried out by Bridges Pound Ltd.							
Hazard Ref.	Hazard	Severity (1-5)	Likelihood (1-5)	Risk	Control Measures	Controlled Likelihood	Controlled Risk (1-5)
HR1.1	Poor Ground Conditions	5	4	20	Ground Conditions have been assessed from a desk study, site are required to provide reasonable site investigations and reports to justify the design. The type of Ground on which the design is based is stated in the Design, ensure the ground at formation level matches this description. If local soft spots are found excavate out and backfill as specification.	1	5
HR1.2	Change of plant / equipment	5	3	15	The plant loading is determined through the suppliers design information and is considered as the worst case unless informed otherwise by the contractor. Should there be a change to the planned plant loading the contractor must inform BPL for a reassessment.	1	5
HR1.3	Ground work not as per specification	3	3	9	The haul road thickness, material and installation requirements have been specified as part of the issued design information. Any variation is to be reported for design review prior to the works being carried out.	1	3
HR1.4	Haul Road not installed in accordance with specification	4	2	8	The design assumes a method Compaction and does therefore not require testing. If there is any doubt over the nature of the works on site testing of the installed mat is to be carried out and reported for acceptance.	1	4
HR1.5	Underground Services	5	2	10	Underground services in place in the haul road location should be identified on site or by use of record materials and an adequate support system designed for tracking routes over these installed.	1	5
Risk Criteria							
1 to 8	Risk Acceptable						
9 to 16	Risk to be Reviewed						
17 to 25	Risk Unacceptable						



141 ALBANY RD.
COVENTRY
CV5 6ND

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Temporary Works Design

Haul Road Design

at

The Natural History Museum

for

MACE

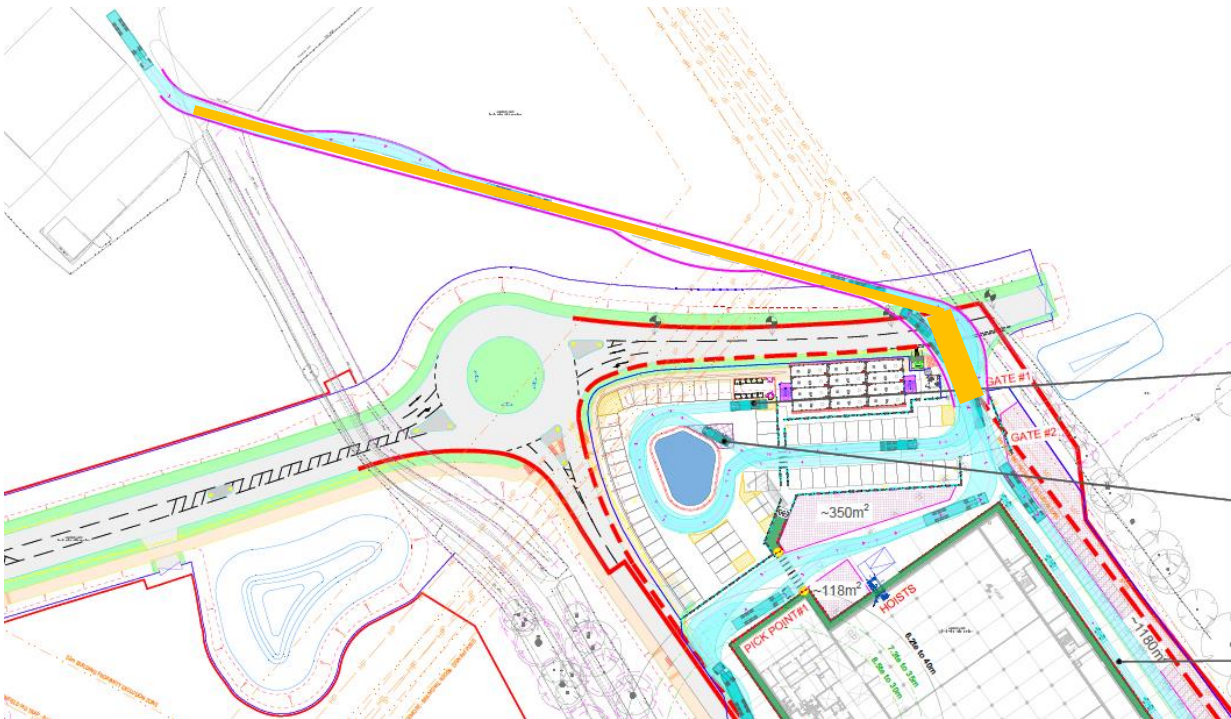
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Rev 0 – Initial issue

Project Outline

MACE have instructed Bridges Pound to carry out a haul road design at their site The Natural History Museum, Reading.

The provided site plan below and appended highlights the proposed location of the hual road.



A Site Investigation has been carried out on the Natural History Museum site, but not along the length of the Haul Road, however there are logs close to the haul road and the land usage for the main site and the haul road are the same so ground conditions will likely be. Once investigations have been carried out, Bridges Pound to be notified to verify site specific requirements.

The two nearest Trial Pit logs from the Site Investigation are shown below.

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CCGI

CC

Borehole No.
TP04

Sheet 1 of 1

Telephone: , Fax: , Email:

Project Name: Natural History Museum - Thames Valley Site

Project No:
C7638

Co-ords: E 474577 N 169335

Hole Type
TP

Location: Shinfield

Level: 42.48mAOD

Scale
1 : 25.00

Client: Natural History Museum

Dates: Start: 29/06/2022
End: 29/06/2022

Logged By
RT

(m)	Water Levels	Samples & In Situ Testing			Sample	Install	Description	Depth (m)	Level (mAOD)	Legend
		No/Type	Depth (m)	Result						
		B D ES	0.15				Crop over firm to stiff friable brown gravelly sandy SILT with occasional rootlets (<5mm). Gravel is sub-angular to sub-rounded fine to coarse of flint. (TOPSOIL)	(0.30)		
			0.30					0.30	42.18	
		Not Given	0.40				Stiff friable orangish brown slightly gravelly sandy clayey SILT. Gravel is sub-angular to sub-rounded fine to coarse of flint. (BRICKEARTH)	(0.35)		
		B D ES						0.65	41.83	
			0.80				Brown silty very sandy sub-angular to sub-rounded fine to coarse GRAVEL of flint. (RIVER TERRACE DEPOSITS)	(0.35)		
1		B D ES						1.00	41.48	
							Borehole completed at 1.00m			

CCGI

CC

Borehole No.
TP05

Sheet 1 of 1

Telephone: , Fax: , Email:

Project Name: Natural History Museum - Thames Valley Site

Project No:
C7638

Co-ords: E 474642 N 169342

Hole Type
TP

Location: Shinfield

Level: 42.36mAOD

Scale
1 : 25.00

Client: Natural History Museum

Dates: Start: 29/06/2022
End: 29/06/2022

Logged By
RT

(m)	Water Levels	Samples & In Situ Testing			Sample	Install	Description	Depth (m)	Level (mAOD)	Legend
		No/Type	Depth (m)	Result						
		B D ES	0.20				Crop over firm to stiff friable brown gravelly sandy SILT with occasional rootlets (<5mm). Gravel is sub-angular to sub-rounded fine to coarse of flint. (TOPSOIL)	(0.30)		
			0.40				Stiff friable orangish brown slightly gravelly sandy clayey SILT. Gravel is sub-angular to sub-rounded fine to coarse of flint. (BRICKEARTH)	0.30	42.06	
		B D ES	0.60					(0.35)		
		Not Given					Brown silty very sandy sub-angular to sub-rounded fine to coarse GRAVEL of flint, locally very gravelly sand. (RIVER TERRACE DEPOSITS)	0.65	41.71	
1		B D ES	1.00				1.00m: Becoming damp.			
								(1.35)		
		B D	1.50							
2							Borehole completed at 2.00m	2.00	40.36	

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Design Check of Site Access Road in Accordance with Road Note 29

Based on Road Note 29 the required depth can be assessed based on the following criteria:

Design Life of 24 Months

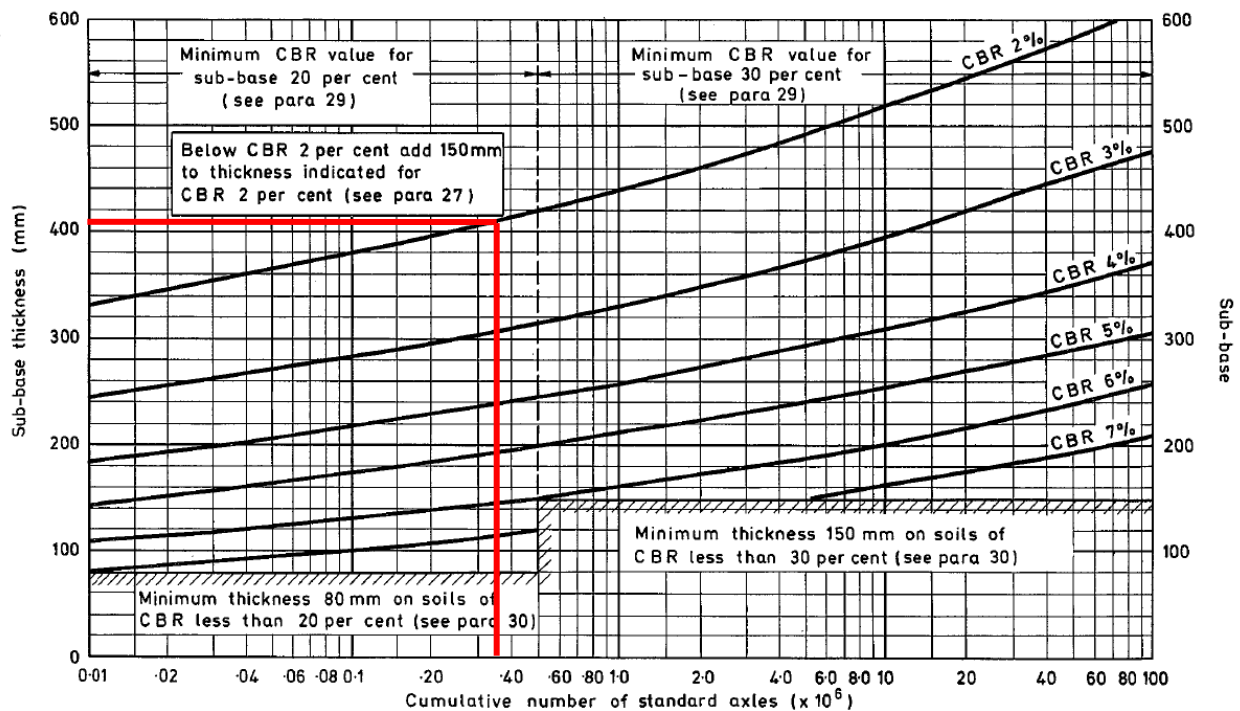
Estimated traffic flow - similar to a major through road: 100.

No. of standard axles per vehicle = 6

Number of standard axles = $6 \times 100 \times 5(\text{days}) \times 104(\text{weeks}) = 312000$ Standard Axles / $1 \times 10^6 = 0.312$ million standard axles.

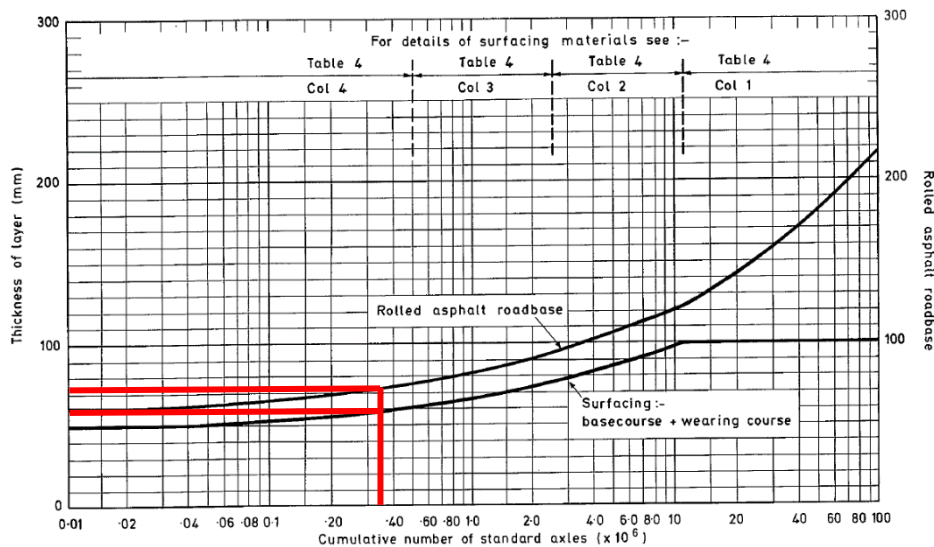
Site CBR value of 2% is assumed, this value will need to be verified upon receipt of site investigations.

From below the thickness of sub-base required will be 410mm.



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For the bound course, from the table from Road Note 29 below, the combined thickness of road base and surfacing required is $75 + 60 = 135\text{mm}$.



The total thickness required is therefore:

$$410\text{mm} + 135\text{mm} = 545\text{mm required}$$

Therefore, provide the following:

135mm macadam, in layers of 75mm and 60mm

410mm compacted Type 1 (MCHW1 803) sub-base as per the specification on the following pages.

A Geotextile separator should be provided between the capping material and the subgrade.

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WORKING PLATFORM NOTES AND SPECIFICATION

Methodology

- Remove existing loose topsoil if present and proof roll the exposed surface of the improved soils. All soft spots are to be excavated and backfilled with compacted granular material.
- Install geotextile layer to exposed cohesive soils such as Terram T1000 or equivalent.
- Lay stone mat of Type 1 (MCHW1 803) on the existing natural ground in compacted layers, totalling a thickness of 410mm then Lay 135mm macadam.

Specification

- The Type 1 (or similar) granular material for the platform shall conform with the following:-
 - Free of organic matter.
 - Shall not contain more than 15% fines by weight.
 - Be free draining.
 - Durable and not easily degraded during the life of the platform and other site uses.
 - Maximum particle size to be 100 mm.
- The material can be of the following commonly available materials:-
 - Crushed hard rock.
 - Clean and graded concrete rubble.
- Angle shearing resistance $\geq 40^\circ$.

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Compaction requirements

In Accordance with Table 6/4 of Specification for Highway Works for Method 6 Compaction.

Compaction Plant	Ref	Category	N for D = 110mm	N for D = 150mm	N for D = 250mm
Smooth Wheeled Roller		Mass per M width of Roll; Over 2100 up to 2700kg Over 2700 up to 5400kg Over 5400kg	Unsuitable 16 8	Unsuitable Unsuitable 16	Unsuitable Unsuitable Unsuitable
Grid Roller		Mass per M width of Roll; Over 2700 up to 5400kg Over 5400 up to 8000kg Over 8000kg	Unsuitable 20 12	Unsuitable Unsuitable 20	Unsuitable Unsuitable Unsuitable
Deadweight Tamping roller		Mass per M width of Roll; Over 4000 up to 6000kg Over 6000kg	12 8	20 12	Unsuitable 20
Pneumatic-Tyred Roller		Mass per Wheel; Over 2500 up to 4000kg Over 4000 up to 6000kg Over 6000 up to 8000kg Over 8000 up to 12000kg Over 12000kg	Unsuitable 12 12 10 8	Unsuitable Unsuitable Unsuitable 16 12	Unsuitable Unsuitable Unsuitable Unsuitable Unsuitable
Vibratory Tamping Roller		Mass per M width of Roll; Over 700 up to 1300kg Over 1300 up to 1800kg Over 1800 up to 2300kg Over 2300 up to 2900kg Over 2900 up to 3600kg Over 3600 up to 4300kg Over 4300 up to 5000kg Over 5000kg	Unsuitable 12 8 6 6 4 3 3	Unsuitable Unsuitable 12 10 10 8 7 6	Unsuitable Unsuitable Unsuitable Unsuitable Unsuitable 12 10

N = Number of passes of roller

D = Compacted Depth