



Haigh Huddleston & Associates

Civil & Structural Engineering Consultants

Firth Buildings, 99 - 101 Leeds Road, Dewsbury, WF12 7BU

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E17/6960/MD/002

7th October 2020

FAO – Rosie Carr
C/O Marcus Walsh
Martin Walsh Architectural Ltd
99-103 Leeds Road
Dewsbury
Wakefield
WF12 7BU

Dear Madam,

Re: Proposed development at Clough House, Leeds Road, Batley

Further to your request, Haigh Huddleston Associates have undertaken investigation works to confirm whether soak-a-ways would be a suitable long term method of surface water disposal for the proposed residential development.

The development site consists of the two storey stone built Clough House and surrounding garden areas. From the southern corner of the site a looped asphalt drive leads from Leeds Road to the front of the property which is situated centrally to the site. A drive leads up the western side of Clough House to a second two storey stone residential building and two garage/storage buildings.

The majority of the remainder of the site is grassed, with scattered tree growth throughout, becoming more dense adjacent the southern and eastern boundaries. There is an area of more cultivated soft landscaping adjacent the western boundary.

The south eastern boundary on Leeds Road and the south western boundary with the adjacent properties formed by a stone wall. The remaining boundary to the west and east is formed by a mixture of fencing. The north is open to the adjacent field.

The site slopes upwards from a low point of 143.9m AOD on the south east boundary adjacent the entrance at an average grade of 1 in 11 to the existing property. From here the site continues to rise at a shallower gradient of 1 in 30 to a high point of 151.7m AOD in the north western corner of the site.

Please find attached our findings in relation to these investigation works.

1. FIELDWORK

1.1 The fieldwork comprised of a three trial holes undertaken using a JCB 3CX with back actor and 600mm wide bucket. The trial pit locations were restricted by the existing buildings and services within the access to the site. The location of the trial pits are indicated on drawing E17/6960/03 at the rear of the report.

1.2 Materials encountered within the trial pits were examined and categorised. The trial pit logs are at the rear of the report.

- 1.3 The soak-a-way test was undertaken in accordance with the method specified in BRE Digest 365 Soak-a-way Design. An instantaneous supply of water was provided via an IBC. The trial pit was filled and the water levels were recorded against time as the water permeated into the natural strata. Repeat testing was only undertaken in TP04.
- 1.4 The water level was monitored over an extended time period to determine the infiltration rate for the sandstone strata. The infiltration rate has been calculated in each case between the 75% and 25% full values as recommended in the BRE Digest 365.
- 1.5 The soak-a-way test results are attached to the rear of this report.

2. RESULTS OF THE INVESTIGATION

- 2.1 TP01-TP03 were undertaken in the grassed areas to the south and east of Clough House. At the surface of all three trial pits was a 0.1-0.25m thick layer of dark brown occasionally gravelly topsoil.
- 2.2 Beneath the topsoil in TP01 and TP02 was a 0.4-1.0m layer of fill consisting of soils, brick, crushed bricks, clays and cobbles. This had been used to create a level slope in this area of the site.
- 2.3 Beneath the topsoil and artificial strata was a 1.2-1.8m thick layer of soft to stiff orange mottled grey clay with occasional flaggy sandstone cobbles and gravels. In TP01 this became a stiff grey mottled light brown clay that extended to the base of the trial pit at 2.2m below existing ground levels. In TP03 just south of the existing property there was a 0.25m thick band of moderately weak weathered grey sandstone at the base of the clay/
- 2.4 At the base of TP02 and TP03 was a moderately weak weathered mudstone excavated as small angular gravels. This was encountered at depths of 1.75-2.3m across site.
- 2.5 TP04 was undertaken in an area of planting to the west of the property. The surface consisted of 0.5m of dark brown topsoil with numerous rootlets overlying 1.2m of moderately strong sandstone excavated as flaggy cobbles in a sand matrix. At the base of the trial pit, there was a moderately strong light brown mudstone that proved difficult to excavate. This extended from 1.7m below existing ground levels to the base of the trial pit at 2.1m below existing ground levels.
- 2.6 It was not possible to undertake soak-a-way testing in the north east of the site due to the concrete floor slabs to the former piggery remaining in-situ at shallow depth. The trial pits here proved a shallow depth of topsoil overlying demolition rubble including bricks, crushed bricks and fragments of asbestos sheeting with the concrete slabs encountered at 0.25-0.8m below existing ground levels.
- 2.7 No ground water was encountered within the trial pits.

- 2.8 The infiltration rates calculated are summarised in the table below. The calculation sheets are included to the rear of the report along with the soak-a-way location plan.

SOAK-A-WAY TEST	INFILTRATION RATE (m/s x10 ⁻⁶)
TP01	NEGLIGIBLE DROP IN LEVEL
TP02	NEGLIGIBLE DROP IN LEVEL
TP03	NEGLIGIBLE DROP IN LEVEL
TP04 – TEST 1	47.5
TP04 – TEST 2	34.5

- 2.9 TP01, TP02 and TP03 in the southern half of the site recorded negligible infiltration rates within the natural clay and mudstone strata.
- 2.10 Only TP04 recorded a moderate infiltration rate of 3.45-4.75x10⁻⁵ m/s within the weathered sandstone strata.

3. CONCLUSIONS

- 3.1 The soak-a-way tests undertaken in the lower southern half of the site proved underlying clays and mudstone with a negligible infiltration rate. Only the one soak-a-way in the central western area of the site proved a positive infiltration rate through a shallow layer of weather sandstone.
- 3.2 It will not be possible to drain the lower southern half into soak-a-ways in this position on site. Due to the limited area of site recording a positive infiltration rate we would not consider soakaways to be an acceptable method of surface water disposal.
- 3.3 We would recommend the Lead Local Flood Authority and Local Water Authority are contacted to agree a location and discharge point to either a watercourse or the adoptable sewer system in accordance with SUDS hierarchy requirements.

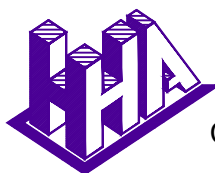
We trust that the above is sufficient for your current requirements, however should you need any further information please do not hesitate to contact me direct.

Yours faithfully,

REDACTED

MICHAEL DEAN BSc HND
m.dean@haighhuddleston.co.uk

Enclosures.



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Client

ROSIE CARR

Project

CLOUGH HOUSE, LEEDS ROAD

Detail

SITE INVESTIGATION PLAN

Scale	Dwn	Chkd	Date	Dwg No.
1:500	MD		Oct'20	E17/6960/03

PRELIMINARY ISSUE



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FORM HHA 5

TRIAL HOLE NO. 1

Client :	ROSIE CARR, C/O MWA	Job No :	6960
Site :	CLOUGH HOUSE, BIRSTALL	Date :	July 2020
0.0			

	0.1	Long grass over dark brown topsoil with numerous gravels.
		Stiff light brown mottled grey clay (fill).
0.5		
	0.6	
		Dark brown topsoil with rootlets and crushed brick.
1.0		
	1.0	
		Firm to stiff orange mottled grey clay.
1.5		
	1.6	
		Stiff grey mottled light brown clay.
2.0		
	2.2	
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation	NO
Sample taken	NO
Sides of excavation remained stable	YES
Level

NOTES:

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FORM HHA 5

TRIAL HOLE NO. 2

Client :	ROSIE CARR, C/O MWA	Job No :	6960
Site :	CLOUGH HOUSE, BIRSTALL	Date :	July 2020

0.0		
	0.1	Long grass over dark brown topsoil with numerous rootlets.
		Soils, brick, crushed brick, stone cobbles – fill.
0.5	0.5	
		Soft to firm orange mottled grey clay with rootlets.
1.0		
1.5		
2.0		
	2.3	
2.5	2.5	Highly weathered moderately weak light brown mudstone excavated as small angular gravels.
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation NO
Sample taken NO
Sides of excavation remained stable YES
Level

NOTES:

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FORM HHA 5

TRIAL HOLE NO. 3

Client :	ROSIE CARR, C/O MWA	Job No :	6960
Site :	CLOUGH HOUSE, BIRSTALL	Date :	July 2020

0.0		
	0.25	Short cut grass over grey topsoil with gravels.
0.5		Soft to firm light brown mottled grey sandy clay with numerous flaggy sandstone gravels and cobbles.
1.0		
1.5	1.5	
	1.75	Moderately weak weathered grey sandstone excavated as flaggy cobbles in a clay matrix.
2.0		Moderately weak weathered grey mudstone excavated as small angular gravels in a clay matrix.
2.5	2.4	
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation NO
Sample taken NO
Sides of excavation remained stable YES
Level

NOTES:

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FORM HHA 5

TRIAL HOLE NO. 4

Client :	ROSIE CARR	Job No :	6960
Site :	CLOUGH HOUSE, BIRSTALL	Date :	July 2020

0.0			
			Dark brown topsoil with numerous rootlets.
0.5	0.5		
			Moderately strong light brown weathered sandstone excavated as flaggy cobbles in a sand matrix.
1.0			
1.5			
	1.7		
2.0			Moderately strong light brown highly weathered mudstone excavated as friable clay with sandstone gravels. Difficult to excavate.
	2.1		
2.5			
3.0			
3.5			
4.0			

REMARKS:

Ground water encountered during excavation	NO
Sample taken	NO
Sides of excavation remained stable	YES
Level

NOTES:

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FORM HHA 5

TRIAL HOLE NO. 5

Client :	ROSIE CARR	Job No :	6960
Site :	CLOUGH HOUSE, BIRSTALL	Date :	July 2020

0.0		
	0.25	Long grass over topsoil. Buried brick and covered floor slabs. Abandoned.
	0.5	
	1.0	
	1.5	
	2.0	
	2.5	
	3.0	
	3.5	
	4.0	

REMARKS:

Ground water encountered during excavation NO
Sample taken NO
Sides of excavation remained stable YES
Level

NOTES:

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FORM HHA 5

TRIAL HOLE NO. 5A

Client :	ROSIE CARR	Job No :	6960
Site :	CLOUGH HOUSE, BIRSTALL	Date :	July 2020

0.0		
0.1		Long grass over topsoil.
0.3		Brick, crushed brick, 1.5 x 0.4 x 0.1 metal sheet, clay tile, glass, broken clay pipe. Difficult to excavate.
0.5		
1.0		
1.5		
2.0		
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation NO
Sample taken NO
Sides of excavation remained stable YES
Level

NOTES:

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FORM HHA 5

TRIAL HOLE NO. 6

Client :	ROSIE CARR	Job No :	6960
Site :	CLOUGH HOUSE, BIRSTALL	Date :	July 2020

0.0		
	0.25	Long grass over dark brown topsoil.
	0.4	Former brick floor Broken asbestos sheet, concrete base.
0.5		Brick walls and fill.
	0.8	
1.0		
1.5		
2.0		
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation NO
Sample taken NO
Sides of excavation remained stable YES
Level

NOTES:

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Soil Permeability test

TP01

Site Clough House

Date Jul-20

Client Rosie Carr

Job No. E19/6960

Pit dimensions m
 Length 1.8
 Width 0.6
 Depth 2.2

Time	Time into Test Mlns	Dip Reading mm	Vol cu.m	Vol Change cu.m	Contact area Avge sq.m	Permeability lit/ sq.m/sec
9.14	0	1650	0.59400		3.72000	
9.15	1	1650	0.59400	0.00000	3.72000	0.00000
9.17	3	1650	0.59400	0.00000	3.72000	0.00000
9.20	6	1650	0.59400	0.00000	3.72000	0.00000
9.57	43	1650	0.59400	0.00000	3.72000	0.00000
15.15	361	1650	0.59400	0.00000	3.72000	0.00000

SOAKAWAY ABANDONED DUE TO STATIONARY WATER LEVEL

Average Permeability Value: 0.000000000 lit/ sq.m/sec

Soil Permeability test

TP02

Site Clough House

Date Jul-20

Client Rosie Carr

Job No. E19/6960

Pit dimensions m
 Length 1.8
 Width 0.65
 Depth 2.6

Time	Time into Test Mlns	Dip Reading mm	Vol cu.m	Vol Change cu.m	Contact area Avge sq.m	Permeability lit/ sq.m/sec
9.50	0	2020	0.67860		4.01200	
9.51	1	2020	0.67860	0.00000	4.01200	0.00000
9.53	3	2020	0.67860	0.00000	4.01200	0.00000
9.55	5	2020	0.67860	0.00000	4.01200	0.00000
10.27	37	2020	0.67860	0.00000	4.01200	0.00000
15.27	337	2020	0.67860	0.00000	4.01200	0.00000

SOAKAWAY ABANDONED DUE TO STATIONARY WATER LEVEL

Average Permeability Value: 0.000000000 lit/ sq.m/sec

Soil Permeability test

TP03

Site Clough House

Date Jul-20

Client Rosie Carr

Job No. E19/6960

Pit dimensions m
 Length 1.9
 Width 0.65
 Depth 2.4

Time	Time into Test Mlns	Dip Reading mm	Vol cu.m	Vol Change cu.m	Contact area Avge sq.m	Permeability lit/ sq.m/sec
10.18	0	1810	0.72865		4.24400	
10.20	2	1820	0.71630	0.01235	4.19300	0.02440
10.23	5	1820	0.71630	0.00000	4.19300	0.00000
10.25	7	1820	0.71630	0.00000	4.19300	0.00000
11.13	55	1820	0.71630	0.00000	4.19300	0.00000
15.40	322	1820	0.71630	0.00000	4.19300	0.00000

SOAKAWAY ABANDONED DUE TO STATIONARY WATER LEVEL

Average Permeability Value: 0.004879301 lit/ sq.m/sec

Soil Permeability test

TP04 TEST 1

Site Clough House

Date

Jul-20

Client Rosie Carr

Job No.

E19/6960

Pit dimensions m
 Length 1.7
 Width 0.65
 Depth 2.1

Time	Time into Test Mlns	Dip Reading mm	Vol cu.m	Vol Change cu.m	Contact area Avge sq.m	Permeability lit/ sq.m/sec
11.07	0	1640	0.50830		3.26700	
11.08	1	1670	0.47515	0.03315	3.12600	0.17285
11.10	3	1720	0.41990	0.05525	2.89100	0.15304
11.12	5	1730	0.40885	0.01105	2.84400	0.03211
11.15	8	1760	0.37570	0.03315	2.70300	0.06640
11.28	21	1840	0.28730	0.08840	2.32700	0.04506
11.54	47	1970	0.14365	0.14365	1.71600	0.04555
12.05	58	2100	0.00000	0.14365	1.10500	0.15431

BRE Value	0.04751938	lit/ sq.m/sec
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Average Permeability Value:	0.095617418	lit/ sq.m/sec
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Soil Permeability test

TP04 TEST 2

Site Clough House

Date

Jul-20

Client Rosie Carr

Job No.

E19/6960

Pit dimensions m
 Length 1.7
 Width 0.65
 Depth 2.1

Time	Time into Test Mlns	Dip Reading mm	Vol cu.m	Vol Change cu.m	Contact area Avge sq.m	Permeability lit/ sq.m/sec
13.16	0	1490	0.67405		3.97200	
13.18	2	1565	0.59118	0.08288	3.61950	0.18195
13.22	6	1640	0.50830	0.08287	3.26700	0.10029
13.44	28	1790	0.34255	0.16575	2.56200	0.04308
14.09	53	1860	0.26520	0.07735	2.23300	0.02151
14.57	101	2100	0.00000	0.26520	1.10500	0.05517

BRE Value 0.03450245 lit/ sq.m/sec

Average Permeability Value: 0.080399787 lit/ sq.m/sec