

REPORT 71590/S/1

51 JACKSONS LANE, LONDON N6

BASEMENT SURVEY

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BASEMENT SURVEY

Phantesie Properties
RBC Wealth Management
Gaspé House
66-72 Esplanade
St Helier
Jersey
JE2 3QT

This report comprises:
5 pages of text
Figures 1 and 2
Appendix A of 3 sheets
Photographs 1 to 17

25 July 2023

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BASEMENT SURVEY

Instruction: Email instruction issued by agents/ Engineers acting on behalf of Phantesie Properties.

1 INTRODUCTION

Some four years ago collapsed foul and surface water sewers led to flooding in the basement of the residential property at 51 Jacksons Lane, London N6. A feature of the flood was that it left a considerable quantity of sandy silt on the floor leading to concerns as to the origin of this material. Possible sources include fill behind the basement walls, the mortar in the basement walls and general material collected as the water progressed from the drain towards the property.

At the request of the agents for Phantesie Properties, a probing and sampling exercise has been undertaken in the walls of the basement to ensure that these, and the fill behind, had not been unduly eroded.

After a delay of 1 year while listed building consent was being obtained, testing was undertaken on 11 July 2023. The exercise involved dry coring into several walls and then probing the material behind, collecting various samples in the process, as well as visually inspecting the interiors of the walls and the backfill.

2 METHOD

75mm and one 50mm cores were dry cut using a standard diamond core drill, from positions prescribed by the Engineer. Dust was collected by vacuum.

On completion of drilling each hole, its interior was inspected and photographed while the cores and brick fragments were collected, bagged and labelled. In the cases of the holes that were through perimeter walls the soil behind was first visually appraised and then sampled by driving a tube into the material.

3 RESULTS

Four locations were nominated, these being identified as positions A to D. Two holes were cut at each of positions A and C as indicated on Figures 1 and 2. Photographs illustrate the findings.

3.1 Position A

Two cores were cut at Position A. These are referenced A1 and A2.

Core A1 was 1000mm above floor level. It was located at a position in which the white coating on the surface of the wall was severely disrupted seemingly by the passage of moisture, its evaporation and the consequent accumulation of salts. The wall was found to be 350mm thick with no evidence of any waterproofing on the back face. The brickwork was very damp throughout the thickness of the wall. The horizontal and vertical joints between bricks were found to be well filled with mortar. Drilling was in increments: a lump of clayey silt was encountered in the depth increment 100mm to 240mm but no further similar material was observed. The soil behind was probed to a depth of 600mm from the surface of the wall: this was found to be a fill material comprising a well compacted sandy, silty clay containing occasional brick fragments. This material was damp.

Core A2 was 1450mm above floor level in an area in which the white coating on the brickwork was in good condition. There was a tough cementitious render on the face of the wall behind the white coating; the render had a variable thickness in the range 5mm to 15mm. This render probably had fairly effective waterproofing properties. The core passed through 380mm of wall which backed directly onto a deep manhole where there was also a render coating. The vertical and horizontal joints in the brickwork appeared to be well filled with mortar. The brickwork was damp but seemingly less so than at location A1.

3.2 Position B

Core B. The location of Core B was moved to the left from the specified position which clashed with the sink. The revised location was under the flight of stairs at a height of 950mm above floor level. At the test location the coatings on the surface of the wall had been disrupted by the passage of moisture, evaporation and the accumulation of salts. The wall was 350mm thick. The bricks in the wall were very damp but most of the joints were passably well filled. A possible gap in a vertical joint was observed on the left side of the hole, however the mortar may have been lost during the coring operation. There was no damp-proof coating or layer on the back of the wall. The soil behind was a slightly sandy, silty clay fill containing occasional brick fragments. The soil was continuous and firm with no gap to the wall.

3.3 Position C

Two cores were cut at Position C. These are referenced C1 and C2.

Core C1. Core C1 was the first to be cut; it was 50mm in diameter (the only core of this size) and was cut at a height of 620mm above floor level. The core was cut from the back store room extending towards the laundry room but terminating about 10mm before breakthrough so as not to cause unnecessary damage. The wall is some 350mm thick. Although water is reported to have gushed out of this wall the white coating was only slightly damaged by its passage and any subsequent evaporation. The brickwork was found to be very damp. The core hole revealed little even when inspected using an endoscope, in consequence other holes were cut with a 75mm diameter core barrel which facilitated better inspection of the interiors of the walls. No voids were identified.

Core C2. Before Core C2 was cut a vertical mortar joint close to its location 1000mm above the floor, was probed using a knife. There was material in the joint but it had no strength whatsoever; it was probably material that had moved location during the flooding incident.

The core was cut to a depth of 330mm in the 350mm thick wall being drilled from the store room side. A vertical joint between bricks was found to be empty, never having been filled with mortar during construction; the horizontal joints were mortar filled. The bricks were damp but perhaps less moist than lower down.

3.4 Position D

Core D. Core D was cut into the Store Room wall where it backs onto fill. The surface of the wall had been painted white, this layer was in a middling condition showing some disruption from the passage and evaporation of moisture. The wall was 350mm thick. The brick proved to be damp and very soft while the mortar joints (vertical and horizontal) were well filled with mortar. There was no waterproof coating on the back of the wall. The fill was a slightly sandy, silty clay that was well compacted with no evident voids.

3.5 General Observations

The mortar in all of the walls appeared to be lime based. A reference sample was collected from the top of the wall in the Store Room, a location assumed to be unaffected by the flow of water when the flood occurred.

The inside faces of the walls had all been coated with a white finish. This may have been a standard vinyl paint possibly overlying other white layers, some had peeled and was found to have a plastic appearance and texture. Behind the paint some areas had a render layer, this was discontinuous and broken - it is presumed to be a waterproofing material. This render was very robust so evidently contains cement so post-dates original basement construction.

4 MORTAR ANALYSES

Two mortar samples have been subjected to chemical analysis in accordance with documented in-house test methods based on procedures detailed in BS 4551.

Details of the analyses and their results are given in Appendix A of this report, including details of the assumptions made in the calculations. The mix proportions are summarized below:

Sandberg Reference	Client Reference	Mix Type	Mix proportions	
			by weight	by volume
S58634	Location B	Hydraulic lime : sand	1 : 5.9	1 : 2.4
S58641	Reference	Non-hydraulic lime : sand	1 : 6.1	1 : 2.5

5 REMARKS

In general the walls had been well constructed with both horizontal and vertical joints being mortar filled. Filling of vertical joints was notably incomplete in the internal section of wall between the Store Room and Laundry where water had reportedly ingressed. Our opinion is that the joints at this location had never been filled properly rather than the potential alternative of the material being eroded by the incoming water.

All of the bricks are soft and at least damp, some being positively wet. There is no barrier between the walls and the damp soil behind.

The mortar is either a lime or hydraulic lime based material: one analysis indicated hydraulic lime while the other indicated lime. Mix proportions were in the order of 1:2.5 by volume; there is no evidence suggestive of loss of binder consequent of the flood. Positive distinction between lime and hydraulic lime can be obtained by petrographic examination. Given the position and function of the walls it would have been preferable to have used hydraulic lime.

The fill behind the walls is presumed to be the same as the local soil. It is a slightly sandy, silty clay that has a good state of compaction.

It is our opinion that a majority of the silty material seen on the basement floor after the flood must have come from the ground through which the water passed on its route between the drain and the basement. It seems improbable from the available evidence that this material derived from mortar joints or from the fill immediately behind the walls.

The basement lacks ventilation so will possibly never dry out. Addition of ventilation may only serve to increase the rate of deterioration of the coating on the walls as evaporation of water leaves a residue that will continue to disrupt the white coating. Some parts of the wall (Core A2) feature an internal render layer, this may well be a waterproof render and is certainly a later addition to the construction. The render is incomplete with significant areas now missing.

Behind the wall at location A2 is a deep manhole that uses the basement wall as one of its edges. The walls around the manhole are all render coated.

Given the damp condition of the walls, the long term welfare of embedded sections of timber floor joists to the ground floor should be carefully considered.

Phantesie Properties
RBC Wealth Management
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For Sandberg LLP



S M Pringle
Consultant to Sandberg LLP

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25 July 2023

cc Chris Cozins/Brian Smith - agents for Phantesie Properties

FIGURES

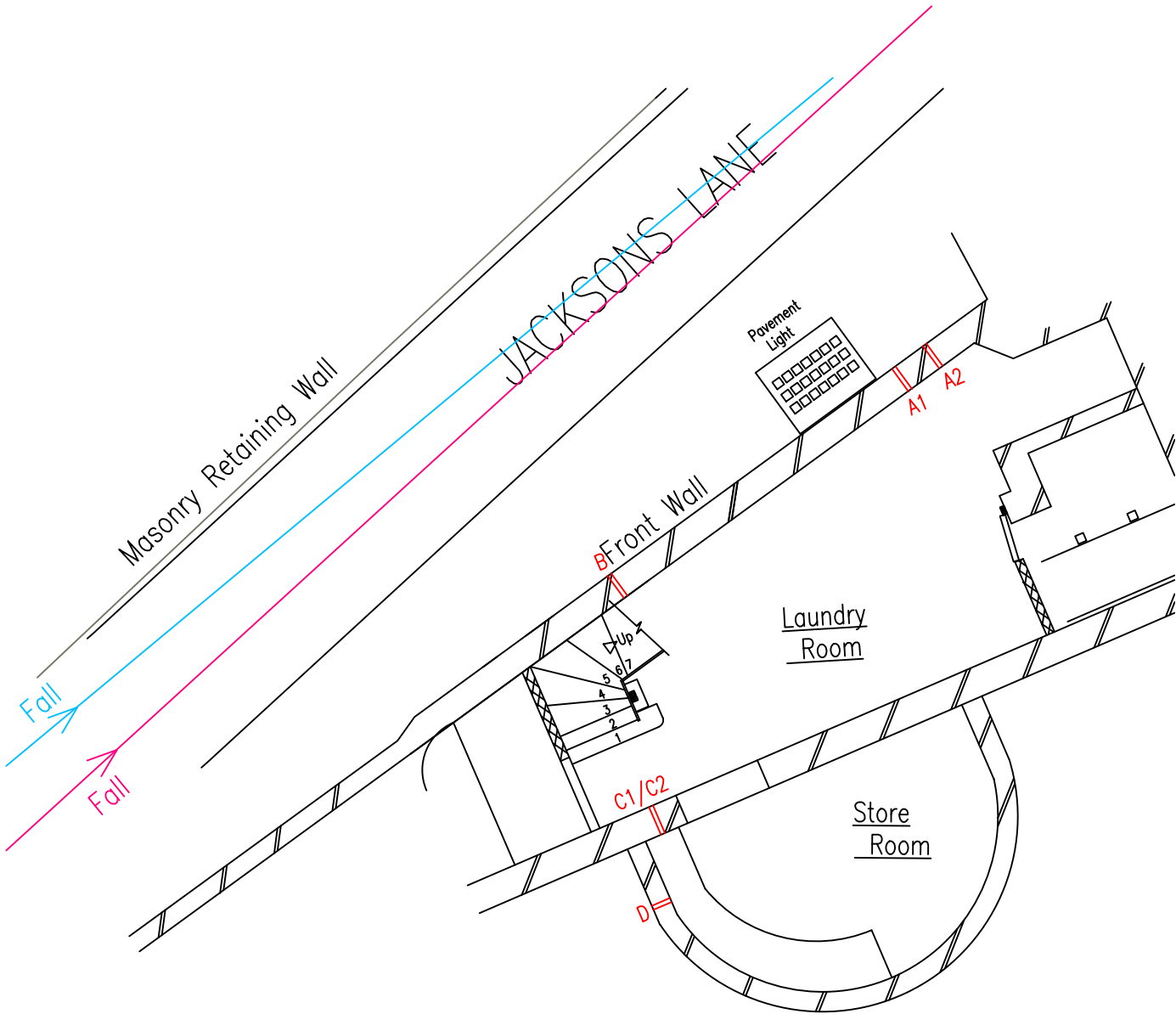
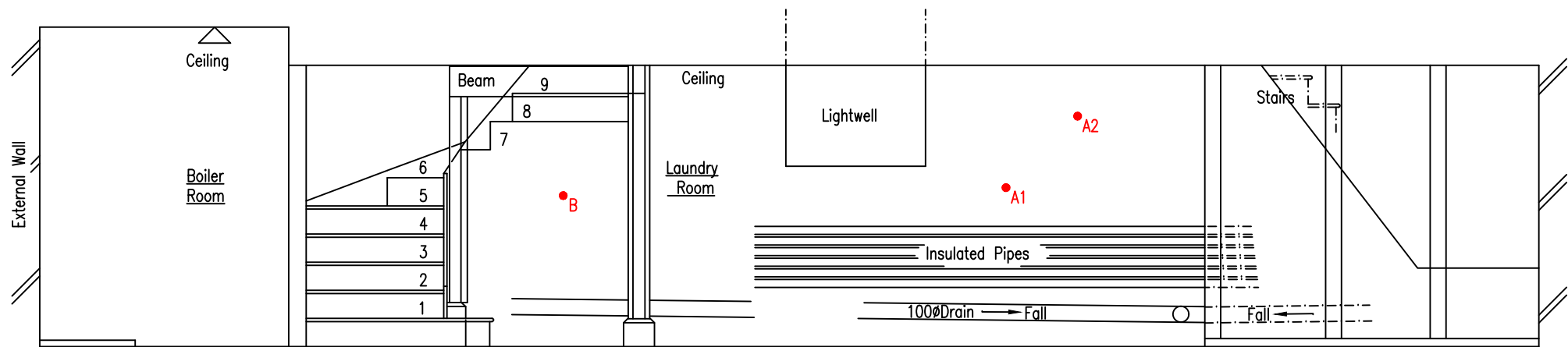
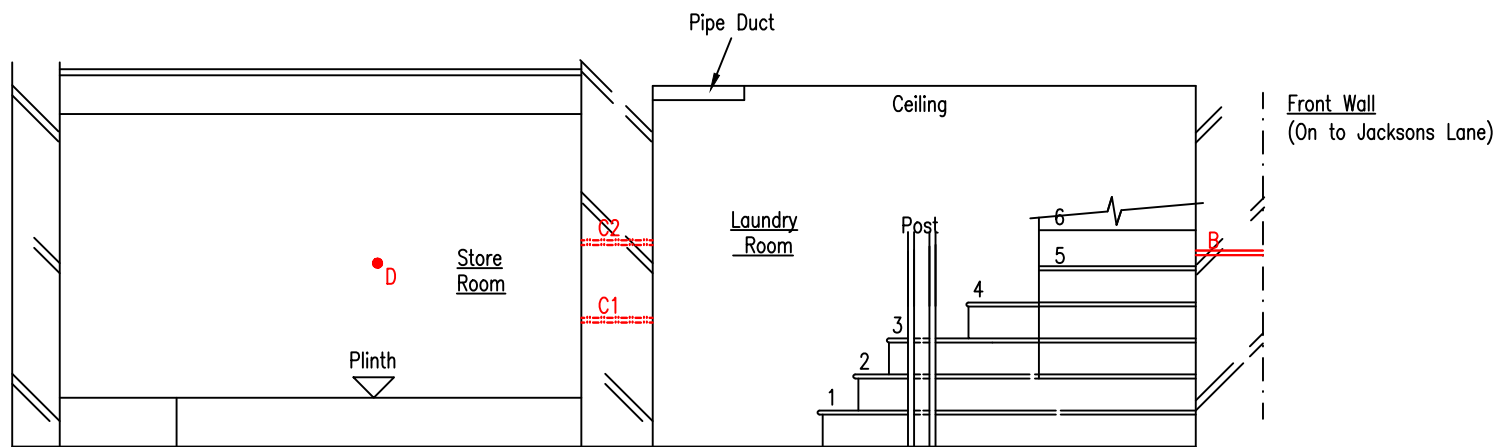


Figure 1 Plan of part of basement showing core locations



Elevation/section showing core locations in front wall



Elevation/section showing core locations in Store Room walls

Figure 2 Elevations/sections showing core locations

APPENDIX A

Analyses of Mortar Samples

ANALYSIS METHODS AND RESULTS

The samples were prepared and analysed using documented in-house test methods, Section 34.1, supported by qualitative chemical analysis where appropriate.

As examination of the analysis data in conjunction with the appearance, tactile properties and available background information for sample S58634 (Location B) suggested that the mix consisted of hydraulic lime and sand, the mix proportions were calculated on this assumption, following documented in-house methods.

As examination of the analysis data in conjunction with the appearance, tactile properties and available background information for sample S58641 (Reference) suggested that the mix consisted of non-hydraulic lime and sand, the mix proportions were calculated on this assumption, following documented in-house methods.

The lime contents were calculated from the acid soluble calcium contents making the assumptions shown in the analysis tables. The approximate volume proportions were calculated using typical bulk densities for the constituents as indicated in the analysis table.

The values assumed by us in the calculations are those that appear to be the most likely after full consideration of the chemical composition and other properties of the samples examined. If further information about any of the constituents of the samples becomes available, calculations of mix proportions could be repeated to take this into consideration. An example is masonry cement which cannot be chemically distinguished from Portland cement in hardened mortar.

REMARKS

It is not always possible by chemical analysis alone to distinguish with certainty between Portland cement and lime binders or between hydraulic and non-hydraulic limes.

Microscopical examination can usually ascertain the presence or otherwise of Portland cement in the mortar and of calcareous material in the aggregate. In the absence of such confirmatory work, interpretation of the analytical results is made on the basis of consideration of the analysis in conjunction with the appearance and any available background information for the mortar.

Mix proportions are traditionally expressed on the basis of volume ratios and, in the absence of information about the particular binder or aggregate, assumed bulk density values are used to calculate such proportions. Volume proportions can as a result be somewhat inaccurate and it may be desirable to use weight proportions if an attempt is made to match the mortar for renovation work.

The analytical results indicated that sample S58634 (Location B) comprised a hydraulic lime and sand mix, and sample S58641 (Reference) comprised a non-hydraulic lime and sand mix.

MORTAR - CHEMICAL ANALYSIS
DETERMINATION OF MIX PROPORTIONS

Documented In-house Methods 34.1(*) and BS 4551:2005+A2:2013

Date of Test

17-18/07/23

Sandberg Reference	S58634			
Client Reference	Location B			
Details	Mortar			
CHEMICAL ANALYSIS		% by mass		
Insoluble Residue	79.69			
Soluble Silica, SiO ₂	3.00			
Acid soluble Alumina, Al ₂ O ₃ *	0.48			
Acid soluble Iron, Fe ₂ O ₃ *	0.31			
Acid soluble Calcium, CaO	8.49			
Acid soluble Magnesium, MgO	0.40			
Acid soluble Sulphate, SO ₃	0.20			
Loss on Ignition	7.38			
Total	99.95			

Calculated Mix Proportions				
Composition to nearest 0.5%	% by mass of dry mass			
Hydraulic lime : sand				
Lime	14.5			
Sand	85.5			
Calculated volume proportions	1 : 2.4			
Remarks	-			

Assumptions used in calculations	SiO ₂ %	CaO %	bulk density kg/m ³	material type
Sand	-	0.0	1400	siliceous
Hydraulic lime	-	62.0	575	Hydraulic

MORTAR - CHEMICAL ANALYSIS

DETERMINATION OF MIX PROPORTIONS

Documented In-house Methods 34.1(*) and BS 4551:2005+A2:2013

Date of Test

17-18/07/23

Sandberg reference	S58641			
Client reference	Reference			
Details	Mortar			
CHEMICAL ANALYSIS				
		% by mass		
Insoluble residue	78.89			
Soluble silica, SiO ₂ *	0.85			
Acid soluble alumina, Al ₂ O ₃ *	0.26			
Acid soluble iron, Fe ₂ O ₃ *	0.17			
Acid soluble calcium, CaO	9.75			
Acid soluble magnesium, MgO	0.04			
Acid soluble sulphate, SO ₃	0.42			
Loss on ignition	9.53			
Total	99.91			

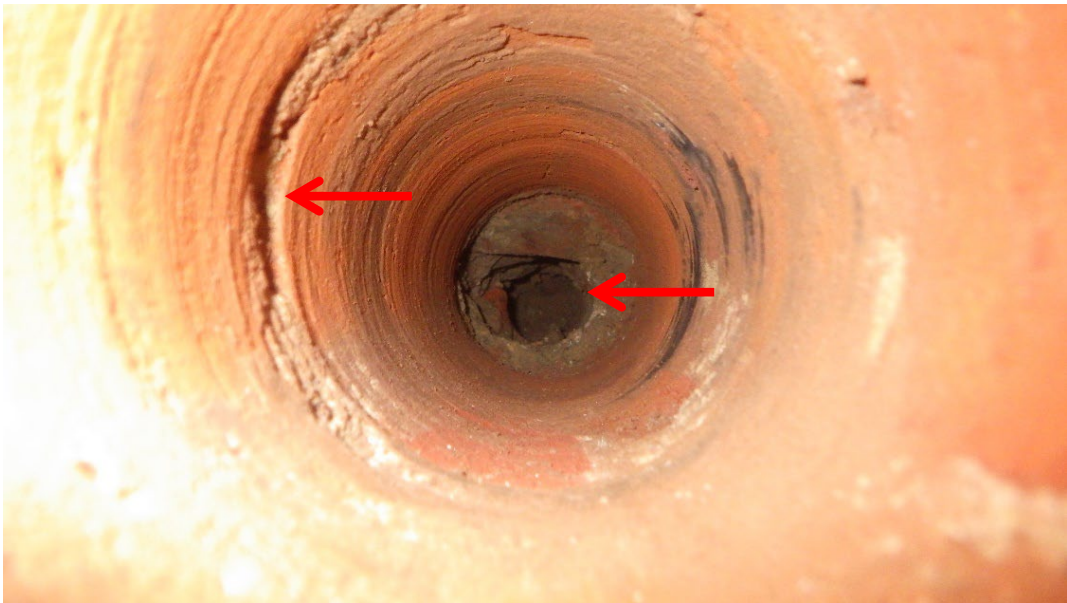
Calculated Mix Proportions				
Composition to nearest 0.5%	% by mass of dry mass			
Non-hydraulic lime : sand				
Lime	14.0			
Sand	86.0			
Calculated volume proportions	1 : 2.5			
Remarks	-			

Assumptions used in calculations	SiO ₂ %	CaO %	Bulk density kg/m ³	Material type
Sand	-	0.0	1400	siliceous
Non-hydraulic lime	-	75.6	575	non hydraulic

PHOTOGRAPHS



Photograph 1 Locations of Holes A1 and A2.



Photograph 2 Location A1. View down hole. Slight voiding in vertical joint on left. Soil sample at back of hole.



Photograph 3 Location A1. Soil sample at back of hole.



Photograph 4 Location A1. View of slight void in joint on left side of hole.



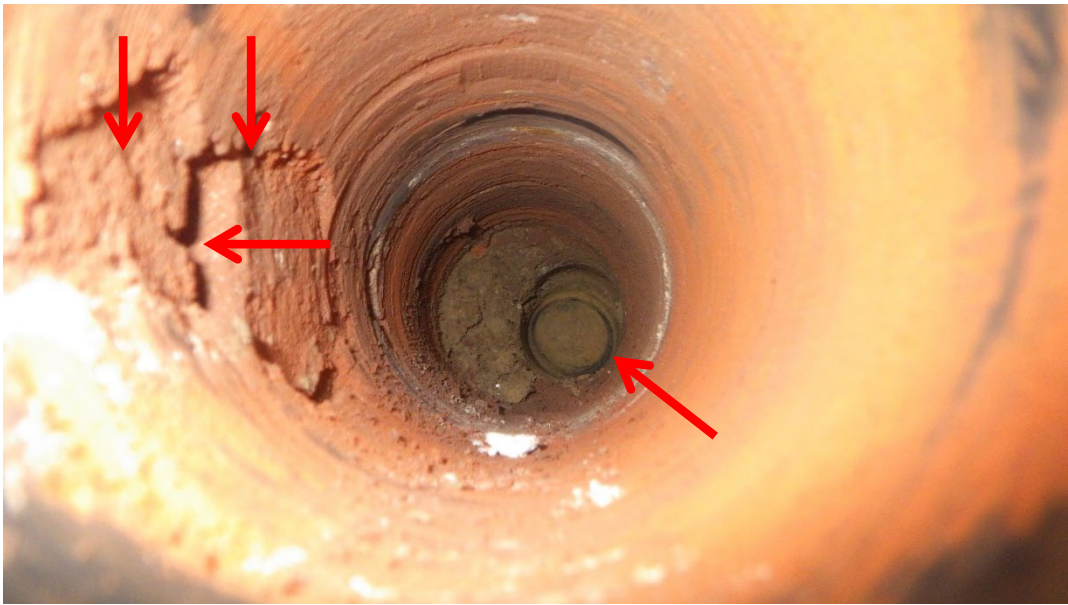
Photograph 5 Location A2. No apparent voids in brickwork. Manhole behind.



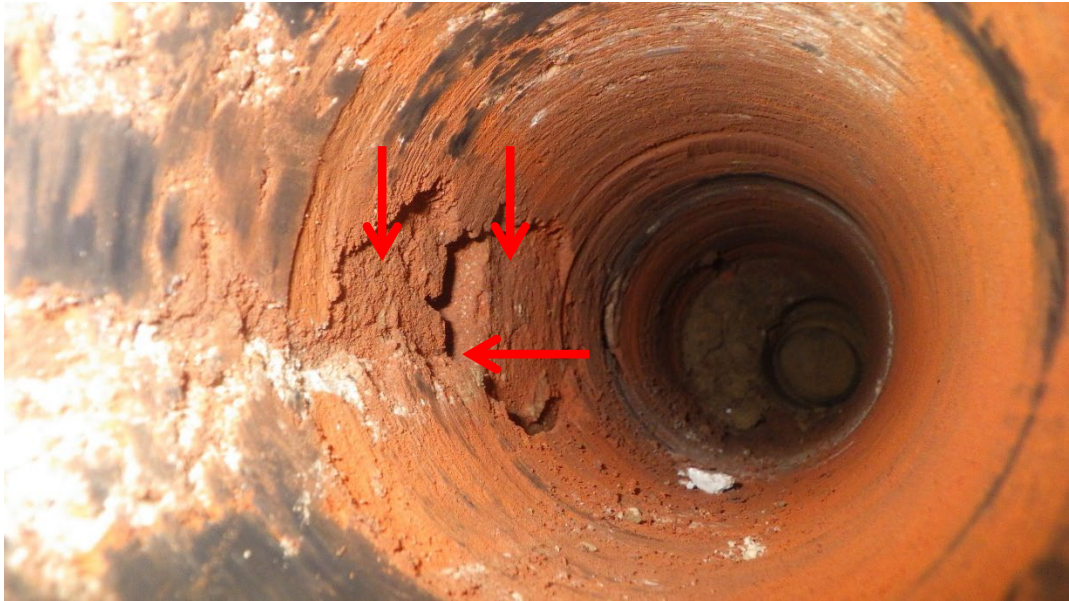
Photograph 6 Location A2. Core sample. Well filled.



Photograph 7 Location B.



Photograph 8 Vertical voids on left side of Location B. Soil sample at back of hole.



Photograph 9 Location B. Further detail of voids on left of hole.



Photograph 10 Location C showing sample locations.



Photograph 11 Location C1 core hole.



Photograph 12 Location C2. Vertical voids in joints to left and at towards back of hole.



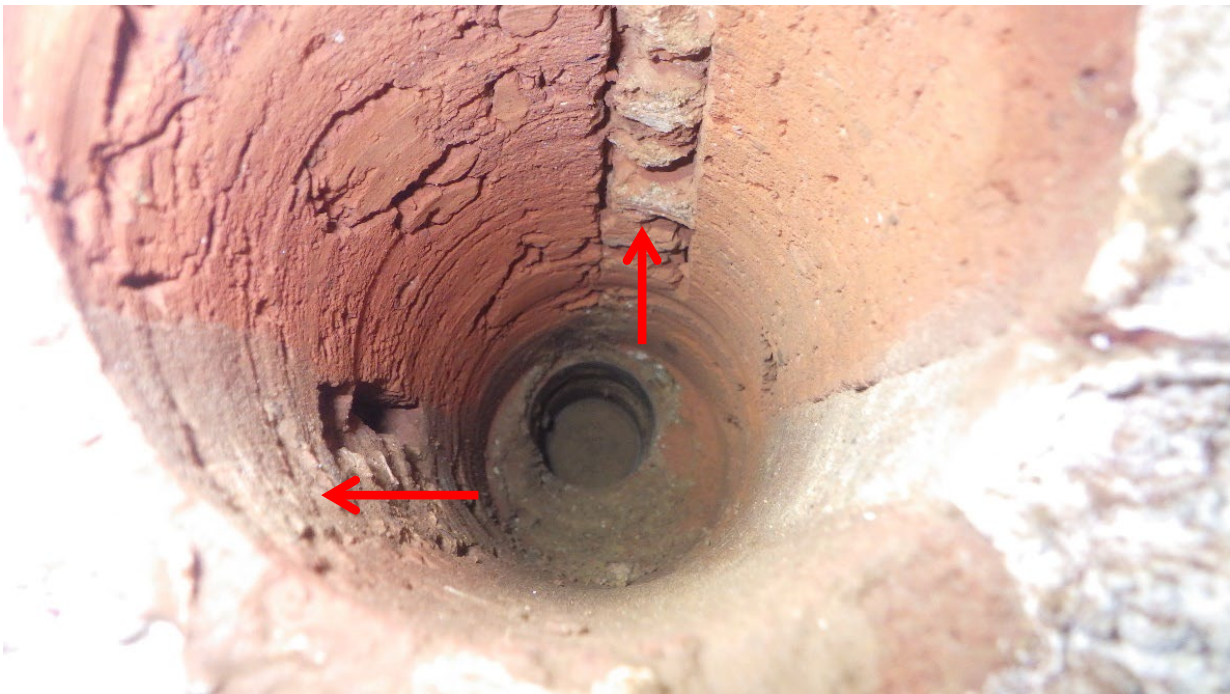
Photograph 13 Location C2. Vertical void between bricks on left.



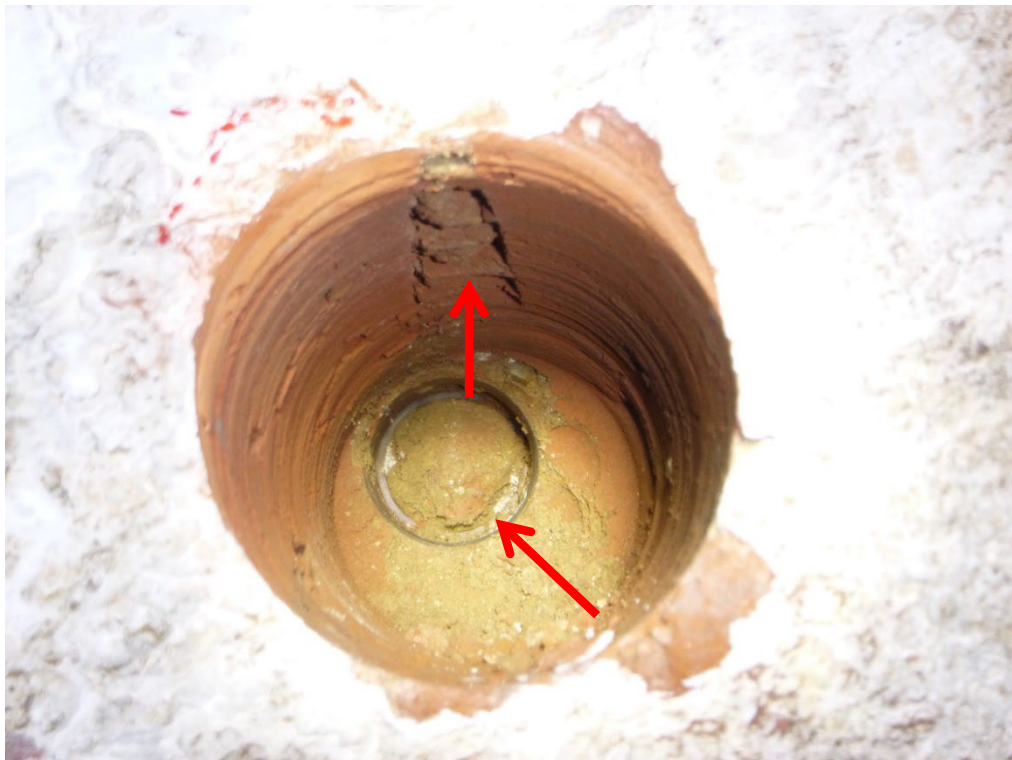
Photograph 14 Location C2. Vertical voids between bricks towards back of hole.



Photograph 15 Location D.



Photograph 16 Location D. Vertical and horizontal joints reasonably well filled with mortar.



Photograph 17 Location D showing mortar filled vertical joint between bricks and soil sample.

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