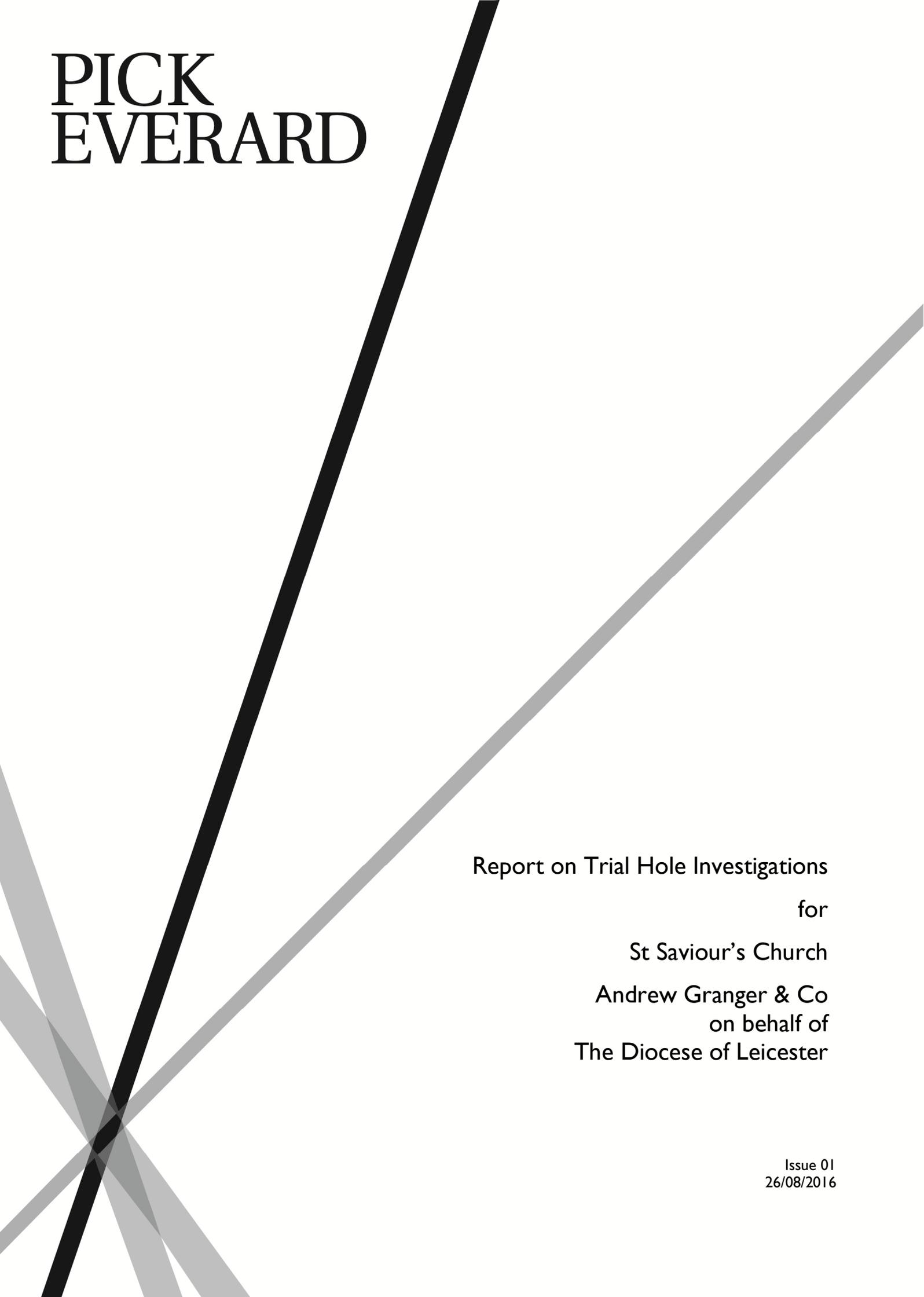


PICK EVERARD



Report on Trial Hole Investigations
for
St Saviour's Church
Andrew Granger & Co
on behalf of
The Diocese of Leicester

Issue 01
26/08/2016

Document History

Issue	Date	Comment	Author	Chk'd
001	26/08/2016	First Issue	KMG	IR



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I.0 Reference and Instruction

I.1 PE Report Reference : STR/IR/KMG/150714/17-2/R003 – Issue 01

I.2 Client : Andrew Granger
on behalf of
The Diocese of Leicester

I.2.1 Address : 2 High Street
Loughborough
Leicestershire
LE11 2PY

I.3 Inspected Property : St Saviour's Church
St Saviour's Road
Leicester
LE5 3HD

I.4 Instruction

I.4.1 Mode : Email of 29/06/2016

I.4.2 Reference :

I.4.3 Instructed by : Benjamin Whitaker

I.4.4 On behalf of : Andrew Granger

I.5 Brief

- Further to Pick Everard report reference STR/IR/IPG/KMG/150714-17.2/R001 dated 18th November 2015, we were instructed to attend site to manage trial hole investigations in relation to excessive internal settlement of the ground floor level at three different locations (see drawing 150714/S/003 in Appendix A).
- To report findings, with conclusions and recommendations.



2.0 Scope of Investigations and Report

In accordance with the aforesaid instructions, the following investigations have been undertaken:-

- Hand dug internal trial holes with soil samples taken at various depths.
- Visual Inspection of soil samples.

The internal trial hole investigations to the property were carried out on 9th August 2016; the weather was fine and dry. Please refer to previous report ref. MWS/BMD/050408/R001 with regard to the superstructure damage and recommendations.

No breaking out or opening up of the building fabric, other than the three trial holes, was undertaken at that time and no part of the property which was not readily accessible, or which was covered or otherwise concealed, was inspected. Absence of report on any such part is not to be taken that it is free from defect. Such unexposed parts may contain problems and special arrangements would need to be made for these areas to be investigated (where practicably possible) if confirmation were to be required about their condition.

Enquiries with local or statutory authorities have not been carried out. Whilst attention may be drawn to any apparent breaches of statutory requirements relative to the buildings or site, the absence of any such comment does not imply compliance with such requirements.

2.1 Orientation

FRONT of the building faces and runs parallel to St Saviours Road.

RIGHT-HAND and LEFT-HAND in relation to the building are taken when facing the Front Elevation i.e. looking from front towards rear.

RIGHT-HAND and LEFT-HAND in relation to individual walls or components are taken when facing that wall or component.



3.0 Details of Investigations

3.1 General

3.1.1 Following our non-intrusive visual inspections of the building structure, we observed three locations where the floor had settled, as previously reported in our report to Andrew Granger (Ref. STR/IR/KMG/150714-17.2/R001). Therefore, three internal trial holes were excavated to investigate the construction detail of the ground floor slab and condition of the underlying subsoils.

3.1.2 The trial hole locations and logs are provided in Appendix A.

3.2 Internal Investigations

3.2.1 The construction detail uncovered at Trial Pit 1 (**Photos 1 & 2**) (see drawing 150714/S/004) was a 120-200mm thick ground bearing in-situ concrete slab covered with a 50mm screed and 20mm thick clay tiles. The underlying soil appeared to be firm made ground to a depth of 550mm, where the trial hole was terminated. However, there were large voids of up to 150mm depth observed above and to the underside of the slab (**Photo 2**). Furthermore, the concrete appeared to be soft with large aggregate elements and therefore unlikely to be of structural grade.

3.2.2 Trial Pit 2 (**Photos 3 & 4**) had a similar construction detail which was a 130-150mm thick ground bearing in-situ concrete slab, 50mm screed and 20mm thick tiles. The underlying soil appeared to be made ground to a depth of approximately 850mm and gravelly sand to a depth of 950mm at which point, the trial hole was terminated.

3.2.3 Trial Pit 3 (**Photos 5 & 6**) was to determine the detail and condition of the timber floor structure which has deflected. The investigation entailed the lifting of the timber floor boards where a previous access point was present; however, no excavation was carried out beneath. The construction detail uncovered was a suspended timber floor with 110mm x 60mm timber joists at 370mm centres. There appears to be a masonry sleeper wall (**Photo 6**) at the midspan of the timber joists, however, from our limited visual inspection it appears the timber joists are not supported by the sleeper wall, possibly due to a construction defect or settlement. Therefore, the joists could span to the external south wall of the South Transept, which would be a length of approximately 4.25m.



4.0 Assessment of Findings

- 4.1 There was significant voiding observed above and beneath concrete the slab at Trial Hole 1, which indicates that the made ground has settled and the slab has therefore lost its bearing and also settled. Further settlement might also be expected.
- 4.2 Additionally, the concrete mix used to cast the slab appeared to be very soft and therefore is potentially not a structural concrete grade. Consequently, the concrete mix may not be adequate for the applied loading and is likely to have resulted in the distortions and damage to the pulpit.
- 4.3 The cause of the settlement at Trial Hole 2 was not clear from our limited intrusive investigations. However, made ground with underlying gravelly sand is typically not suitable soil conditions to provide support to a ground bearing concrete slab. The made ground is therefore also likely to have settled, causing the deflection noted in the floor. As with Trial Hole 1, further settlement cannot be ruled out.
- 4.4 The suspended timber floor at Trial Hole 3 is showing slight settlement at the middle, perpendicular to its span direction. Structural calculations suggest that the floor construction is not adequate to support the loading of a place of worship or domestic property unless the joists are still supported by the sleeper wall at the midspan.

5.0 Recommendations

- 5.1 Typically, to undertake localised remedial works where the concrete floors have settled, we recommend (at Trial Holes 1 and 2) the concrete slab and underlying soil to a depth of 600mm below the underside of the existing slab should be removed. Then either lean mix concrete or Type 1 granular fill in 4 No. 150mm layers should be used to backfill the area. We would then recommend constructing a new in-situ concrete slab using a GEN 3 (C16/20) mix with dowel reinforcement into the existing concrete. The thickness of the slab would depend on the proposed future use of the building.
- 5.2 An alternative option would be to excavate a series of window sample boreholes at various locations, to confirm the extent and depths of the soil constituents, and to appoint a specialist contractor to provide advice and costings on a suitable ground reinforcement injection scheme to stabilise the settled floor. However, this may not be effective at the location of Trial Pit 1, where the potentially weaker non-structural slab was observed.
- 5.3 In relation to the timber floor observed at Trial Hole 3, we recommend that further and more extensive intrusive investigations are undertaken to confirm if the sleeper wall is supporting the timber joists and the location of any other intermediate supports. If the joists are found to have no intermediate support provided, we would recommend the sleeper wall is built up with timber packings to ensure it supports the underside of the timber floor joists at the South Transept. We also advise installing a damp proof membrane (DPM) at the top of the brickwork of the sleeper wall to prevent potential future damp penetration to the timber floor.
- 5.4 Although the above recommendations are typical to repair localised damage such as that observed during the investigations, please note that the scope and detail of any proposed remedial repairs will depend on the future use of the building. The recommendations stated above only consider a loading of 3 kN/m² exerted on the structure in its current application as a “Place of Worship” according to BS EN 1991-1.



The extent of the apparent weaker concrete floor slab noted at the location of Trial Hole 1 could not be ascertained as part of the brief for these investigations. This weaker slab may extend over a large area and may not be suitable to take any loads of a significant nature.

- 5.5 When considering any future use of the building, the full extent and loadbearing capacity of the concrete slabs and all other floor areas, should be determined to ensure that there are either adequate or whether they require more extensive remedial works or replacement.

6.0 Status of Report

This report does not provide a warranty or guarantee as regards the structural adequacy and condition of the building. It provides a considered professional opinion based on a limited visual inspection and no liability shall attach to us except to the extent that we have failed to exercise reasonable skill, care and diligence in the provision of our services.

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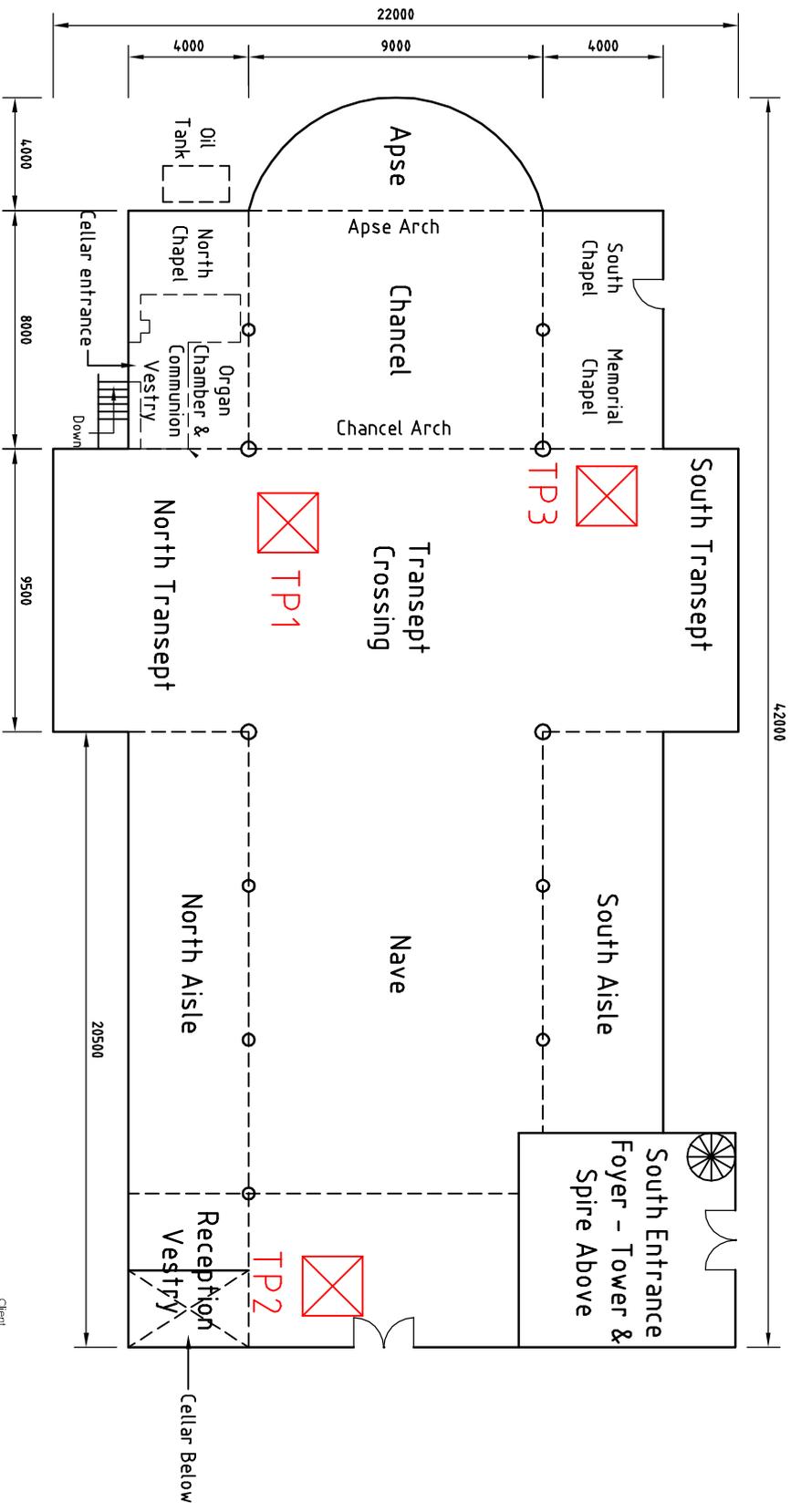
Appendix A

Drawings

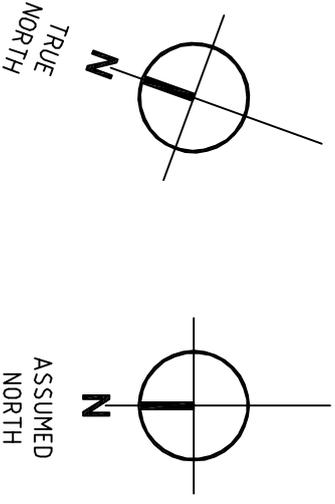
- Drawing No. 150714/S/003 - Trial Hole Locations
- Drawing No. 150714/S/004 - Trial Hole 1
- Drawing No. 150714/S/005 - Trial Hole 2



NO DIMENSIONS TO BE SCALED FROM THIS DRAWING



TP 1&2 - Trial Pit Beneath Quarry Floor Tiles
TP 3 - Lifting timber floorboards



Revisions	Date	Drawn	CHK'd	
C	Final Locations - issued after works have taken place	26.08.16	KMG	KMG
B	Updated Locations	11.02.16	KMG	IPG
A	First Issue	05.01.16	KMG	IPG

Client
Diocese of Leicester

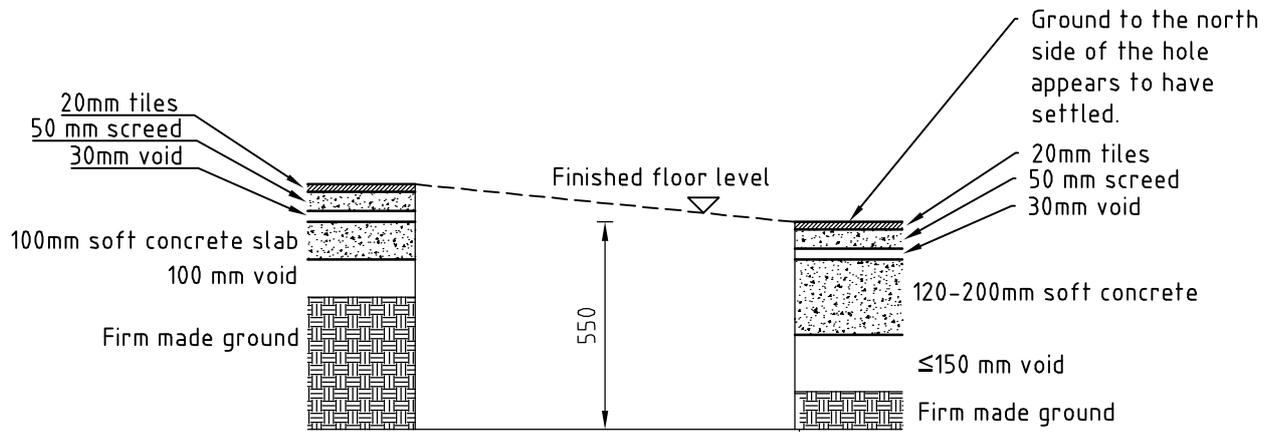
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Project
St Saviour's Church
 Leicester

Drawing Title	Status
Triad Hole Locations	SURVEY
Scale - unless otherwise stated	NTS
Sheet	of A4
Drawing Number	150714/S/003
Revision	C

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Diocese of Leicester

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Consulting Engineers
Project Managers
Surveyors

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St Saviour's Church

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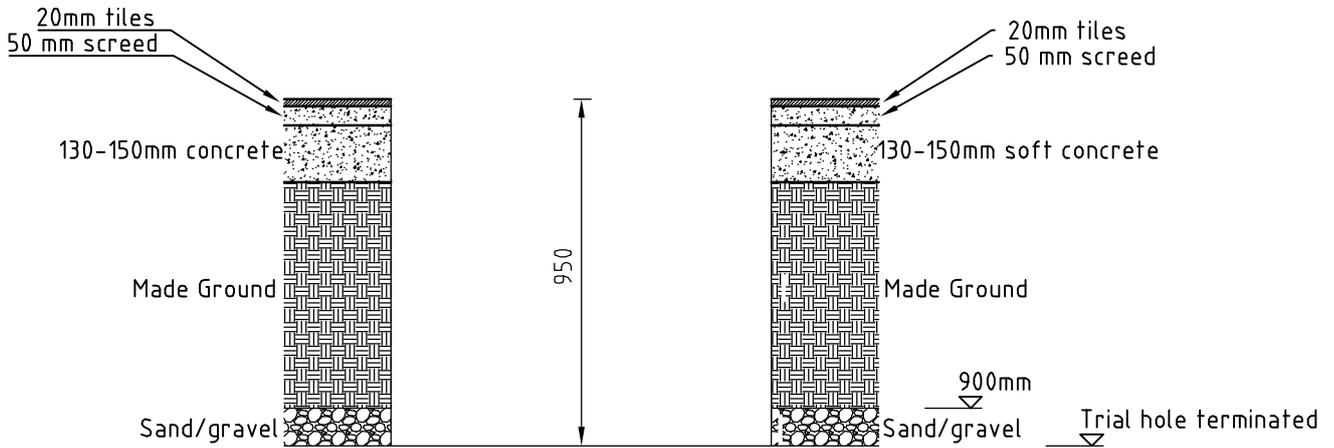
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P01	Site Investigations	26.08.16	KMG	IPG
Revisions		Date	Drawn	Chk'd

Drawing Title	Status
Trial Hole Investigations	INFORMATION
Trial Pit 1	Scale - unless otherwise stated 1:20 at A4
Drawing Number	Rev
150714/S/004	P01

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P01	Site Investigations	26.08.16	KMG	IPG
Revisions		Date	Drawn	Chk'd

Drawing Title	Status
Trial Hole Investigations	INFORMATION
Trial Pit 2	Scale - unless otherwise stated 1:20 at A4
Drawing Number	Rev
150714/S/005	P01

Appendix B

Photographs





Photo No. 1



Photo No. 2



Photo No. 3



Photo No. 4



Photo No. 5



Photo No. 6

