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'Pickhill Farm', Talwrn, Cross Lanes, Wrexham

Structural Appraisal Report

May 2025

Rev.C – 08 Nov. 25

Job No. 2024/124

CONTENTS

Ref.	Title	Page
1.0	Executive Summary	1
2.0	Clients Brief	4
3.0	Inspection	
	3.1 General	5
	3.2 External Inspection	6
	3.3 Internal Inspection	13
4.0	Discussion and Conclusions	24
5.0	Recommendations	26
6.0	Limitations and Liability	27

Appendix A – Reference Drawings
Appendix B – Northern Outrigger Stabilisation
Appendix C – Typical Repair Details
Appendix D – Ground Investigation Reports

1.0 Executive Summary

The property is a detached farmhouse arranged over two storeys. The original part of the property is of timber framed construction with brick infill between dating back to the late 16th and early 17th century. An outrigger dating back to the 18th or 19th centuries has been constructed from rubble masonry walls on the north elevation. A basement is provided under the northern outrigger. The roof over the entire property comprises slated finishes supported off traditional purlin and rafter construction. Metal tie bars have been installed to both side elevations of the outrigger to restrain the movement in the end gable. Both ties are anchored at first floor level.

Various traditional brick outbuildings and modern steel framed barns are provided to the north and west of the farmhouse, all of which are outside the scope of this report.

The property currently carries a Grade II listing.

Trial holes excavated around the property have revealed that the foundations comprise a mixture of brick and sandstone spreaders extending into firm clay at typically 300mm below original ground level.

The overall condition of the property is considered to be fair with sections of the embedded timber framing and the northern outrigger considered to be poor.

Severe cracking is apparent internally and externally within the northern outrigger which has resulted from movement in the end gable elevation. Following dewatering, an inspection of the basement revealed severe cracking in the north east corner and a very uneven floor. Tide marks to the walls indicate that the water table is very high. Significant vertical movement has occurred along the gable elevation causing the wall to rotate away from the property. A previous attempt to stabilise the gable has been only partially effective. Tie bars anchored back to the first floor have been installed. However, the movement in the wall has resulted in large forces in the ties which are causing the side elevations to separate at the anchoring points. The movement is significant and progressive. Photographs of the property from the mid-20th century show the previous structural interventions. This would confirm that the movement to the northern outrigger is a long standing issue which the previous interventions have failed to address.

Ground investigations (refer to Appendix D) have confirmed that the ground conditions comprise a thin layer of made ground (hardstanding and gardens) overlying firm becoming stiff and very stiff clay with rare gravel inclusions. Investigations within the basement have confirmed that the cellar walls sit directly onto wet slightly sandy clay at 150mm below floor level. The investigations have confirmed that the persistent transit of water through the basement over time has softened the clay locally and washed out fines resulting in the apparent movements. The abstraction of water by previous owners has exacerbated the issue.

In order to reduce the risk of foundation movement in the long term, the softer materials directly below the foundations should be removed and the width of the foundations increased to reduce the bearing pressures exerted on the formation. Given the stiffness of the underlying clay deep foundations, such as piling, will be difficult to implement. Therefore, mass concrete underpinning of the existing basement wall is considered to be the most appropriate solution. The clay sub soil has trapped surface water run-off resulting in a very high water table which flows into the basement. In order to safely carry out underpinning, any water entering the basement will need to be removed by pumping. For details of the proposed underpinning, refer to Appendix B.

The movement in the end gable has now reached a point where recently installed external propping could only be considered as a short term temporary measure. Therefore, in order to

ensure long term stability, we would recommend that the northern outrigger be partially dismantled, the foundations stabilised and the walls, floors and roof then reconstructed using material salvaged during dismantling. Refer to Appendix B for a detailed summary of the proposed works.

Some minor cracking is apparent above and below openings in the elevations. This is due to minor foundations movement and a lack of lintels to other elevations. In properties of this vintage, it was common practice to support the brickwork over the openings using the window and door frames. Degradation to the frames over time has resulted in partial removal of the support. The majority of the elevations have been repointed in the past using cement mortar. Cement pointing will trap moisture in the wall which leads to spalling and will also create hard spots which can badly affect brickwork of this vintage. The lime pointing has eroded in areas and was noted as soft when probed. It would therefore be prudent to allow for repointing all of the elevations with lime mortar. The bed joints show slight distortion throughout which is consistent with minor foundation movement. The external walls were noted as slightly uneven with some outwards leaning apparent. This is typically due to a lack of restraint at first floor level. The movement noted is considered to be generally historic.

Severe rising damp is apparent throughout the entirety of the ground floor accommodation. This has caused severe section losses to timber framing embedded within the walls, rot to timber skirtings, failure and debonding of internal plaster finishes and erosion of brick units. In several areas the mortar has broken down completely causing brickwork to become loose. No evidence of a dpc was apparent at the time of inspection and brick units of this vintage are known to be very porous. Any repairs to the internal and external walls will need to allow for the installation of a damp proof course alongside addressing external ground levels and providing gravel drains. As the bricks are very porous, we would recommend that a sheet system is used which will require a slot to be cut in all of the walls. Rotted timbers should be cut back to find solid timber and new sections installed in accordance with best conservation practice. Refer to Appendix C for typical repair details.

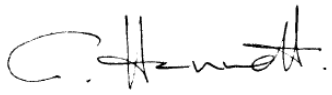
Plaster finishes throughout the property have delaminated from the brickwork. Long term degradation to plaster finishes can occur in all properties. The degradation is especially prevalent in older properties where issues of damp penetration, ineffective and inappropriate previous repairs such as cement pointing and a general lack of maintenance are common. All of the wall and ceiling finishes will need to be renewed as part of any refurbishment of the property.

Ground floor construction generally comprises quarry tiles which are typically laid over thin mortar screeds or laid directly onto ash or compacted earth. The tiled floors are uneven throughout which is not uncommon in properties of this age. A lack of an effective damp proof membrane can lead to damp penetration especially where a high water table is present. Evidence of significant damp penetration was apparent within Room 9 – lounge. In order to ensure that damp penetration is limited, it would be prudent to allow for the solid ground floors to be replaced incorporating an effective membrane which can be lapped up internal and external walls. Alternatively, a breathable limecrete floor system could be utilised though this would be dependent upon water table levels.

The roof alignment shows slight distortions between supports due to deformation of purlins and is not untypical in properties of this vintage. Some localised areas of staining were apparent to ceilings internally with areas of rot to timbers indicative of weather penetration which is likely as a result of missing or slipped roof slates, failing/deteriorating lead flashings in valleys and at roof junctions. Numerous repaired, slipped and loose slates are apparent throughout which is an indication that nail fatigue is endemic. To ensure long term durability, the roof finishes will need to be carefully taken down to allow for repairs to the roof timber where necessary. The

existing slates can then be reinstated augmented by salvaged additional slate where necessary.

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2.0 Client's Brief

This report was commissioned by Spencer Jones to identify whether the main dwelling is structurally sound, to confirm its current condition and to confirm the extent of repairs required to ensure viability in the long term.

3.0 Inspection

3.1 General

An initial inspection was carried out on Friday 24th May 2024 with a detailed inspection undertaken during the morning of Saturday 03rd May 2025. The weather during both inspections was fine and dry. The inspection comprised a visual inspection of those elements readily visible from ground level externally and from within the dwelling making use of a ladder where appropriate. No excavations were undertaken to uncover buried elements and any notes on the condition of these elements are made based on the visible condition of the property. Testing requiring the use of specialist equipment or training, e.g. electrical systems, gas appliances, water systems, etc., has not been undertaken. Manhole covers were not lifted and drains were not tested.

The property is a detached farmhouse arranged over two storeys. The original part of the property is of timber framed construction with brick infill between dating back to the late 16th and early 17th century. An outrigger dating back to the 18th or 19th centuries has been constructed from rubble masonry walls on the north elevation. A basement is provided under the northern outrigger. The roof over the entire property comprises slated finishes supported off traditional purlin and rafter construction. Metal tie bars have been installed to both side elevations of the outrigger to restrain the movement in the end gable. Both ties are anchored at first floor level.

Various traditional brick outbuildings and modern steel framed barns are provided to the north and west of the farmhouse, all of which are outside the scope of this report.

The property currently carries a Grade II listing.

Trial holes excavated around the property have revealed that the foundations comprise a mixture of brick and sandstone spreaders extending into firm clay at typically 300mm below original ground level.

Elevations and rooms are referenced on drawings contained in Appendix A.

3.2 EXTERNAL INSPECTION

3.2.1 West Elevation

The elevation comprises brickwork to full height with embedded timber framing to the central section. The section to the right hand side is a fairly modern single storey range extension with cement pointing whilst the remainder is pointed in lime mortar. Windows and doors comprise timber framing except for the right hand opening which has double glazing in PVCu framing. A modern lean-to porch links the property to the outbuilding at ground floor level. The link is in a poor condition with rotten timber windows, missing glazing and a single brick dwarf wall. The roof over is finished with slates throughout.



West Elevation

The overall condition of the elevation is considered to be good/fair bar the modern link porch.

Bed joint cracking is apparent at high level adjacent to the glazed link. The cause of the cracking is not readily apparent, though it does appear to be fairly longstanding. Lime pointing has eroded throughout with the remainder noted as slightly soft. Isolated spalled and eroded brick units were apparent particularly at low level. This is not uncommon in properties of this age where brickwork is particularly soft and porous.

The exposed timber framing is rotted with significant section losses apparent. Full section losses are apparent to the vertical post adjacent to the back kitchen door within the glazed link.



Cracking to elevation at high level.



Rotted timbers at first floor level.

The ridge line shows a slight distortion between supports. This is due to slight twisting of the purlins. Numerous loose slates are apparent to the roof with several slipped and missing slates also apparent. This would indicate that nail fatigue is endemic with the roof now considered to be life expired and in need of renewal. The chimney stack would appear to have been rebuilt in the past using modern brickwork. No defects were apparent at the time of inspection.

The elevation to the hallway shows an outwards lean of generally 1.4% (14mm in 1.0m) increasing locally to 2.6% close to the extension. The bed joints show a slight vertical distortion on the older part of the property.

3.2.2 North Elevation

The elevation comprises of unequal gabled projections with a recessed central bay. The right gabled projection is of brick construction with timber framing comprising of vertical posts and girding beam visible to the left hand return at first floor level. Two 2 light casement windows are aligned vertically with the projection. The openings are positioned to the left of centre. The central bay retains timber framing with brick infill. A door and later three light casement window are present to the ground floor with evidence of a later window opening, since infilled with brickwork, to the first floor. The left hand range is longer and is of rubble masonry construction. A large crack within the wall confirms that the wall has a rubble fill. The right hand return and the gable end are blank. A red brick end stack is present. The roof over is finished with slates throughout.



North Elevation

Tie bars have been installed across the gable elevation and anchored at first floor level to both sides.

The overall condition of the elevation is considered to be fair/poor.

Severe cracking and missing masonry were apparent at ground floor level to the side elevation of the outrigger. At our initial inspection the cracking was noted as up to 22mm wide.

It would appear that the metal ties have only been partially effective. The ties across the gable elevation are not sufficiently stiff to prevent bulging with the movement at first floor level particularly severe. The movement at first floor has resulted in the wall moving beyond the slated finishes by up to 70mm.

The movement in the gable elevation appears to be progressive with the severity increasing since our initial inspection.



Displacement of gable elevation relative to roof.



Cracking and missing masonry to outrigger.

The timber framing to the central section shows evidence of deterioration notably to its base. Minor section losses are apparent throughout with total losses noted to the base of the vertical post adjacent to the door opening.



Degradation to timber framing.



Degradation to timber framing.

Cracking up to 1mm wide is apparent extending between the window openings. Vertical cracking up to 5mm wide was noted at low level adjacent to the covered link. This type of damage is typically caused by vehicular impacts.

Isolated spalled and eroded brick units were apparent particularly at low level. This is not uncommon in properties of this age where brickwork is particularly soft and porous.



Cracking at low level.

The ridge line shows a slight distortion between supports. This is due to minor distortions in the purlins. Numerous loose slates are apparent to the roof slipped and missing slates also apparent. This would indicate that nail fatigue is endemic with the roof now considered to be life expired and in need of renewal. The chimney stacks would appear to have been rebuilt in the past using modern brickwork. The stack to the gable elevation shows an outwards lean consistent with the wall below.

The elevation shows a general outwards lean of 1% (10mm in 1.0m) except for the outrigger where outwards leans at up to 9% are apparent. The bed joints to the brickwork show a slight vertical distortion.

3.2.3 East Elevation

The elevation comprises brickwork to full height to the left hand part and rubble masonry to the northern outrigger on the right. The elevation is pointed using cement mortar except to the rubble masonry where lime pointing is provided. Windows comprise timber framing. The roof over is finished with slates throughout.

The overall condition of the elevation is considered to be good/fair with the northern outrigger considered to be poor.



East Elevation

Diagonal and vertical bed joint cracking is apparent between the study and bathroom windows. The cracking was noted as up to 3mm wide and would appear to have resulted from movement in the soldier course lintel and very minor settlement of foundations. Cracking up to 6mm wide was apparent at the intersection of the brick and masonry constructions. The pattern of cracking is consistent with the general movement of the outrigger. Cracking up to 3mm wide was noted between and to the left of the living room and bedroom 1 windows. Given the location of a tie bars, the cracking could be attributable to the forces exerted to the wall locally. All of the cracking would appear to be fairly longstanding.



Cracking between study and bathroom windows.



Cracking at intersection of wall types.

Isolated spalled and eroded brick units were apparent particularly at low level. This is not uncommon in properties of this age where brickwork is particularly soft and porous.

The ridge and hip lines show a slight distortion between supports. This is due to minor distortions in the purlins and valley blades. Numerous loose slates are apparent to the roof at the southern end with slipped and missing slates also apparent. This would indicate that nail fatigue is endemic with the roof now considered to be life expired and in need of renewal. The chimney stacks would appear to have been rebuilt in the past using modern brickwork. The stack to the northern end shows an outwards lean consistent with the wall below.

The elevation shows a general outwards lean of 1% (10mm in 1.0m). A bulge is apparent in the wall at ground floor level to the right of the living room window. Outwards leans at up to 2.7% are apparent in the study and stairwell walls and a lean of 1.9% in the lounge wall. The bed joints to the brickwork show a slight vertical distortion.

3.2.4 South Elevation

The elevation comprises brickwork to full height. The section to the left hand side is a fairly modern extension. The elevation is generally pointed using cement mortar. Windows and doors comprise timber framing except for the left hand opening which has double glazing in PVCu framing. The roof over is finished with slates throughout.

The overall condition of the elevation is considered to be good/fair.



Part South Elevation



Part South Elevation

Vertical bed joint cracking is apparent extending through the wc and bathroom windows on the left hand part of the elevation. The cracking was noted as up to 3mm wide at ground level. The cause of the cracking is not readily apparent, though it does appear to be fairly longstanding. Isolated spalled and eroded brick units were apparent particularly at low level. This is not uncommon in properties of this age where brickwork is particularly soft and porous. An area of untidy pointing is apparent with eroded brick units locally. Loose brickwork was apparent above the sitting room door. This is due to a lack of effective support from the door frame.



Cracking below wc window.



Poor quality pointing and eroded brickwork.

The ridge and hip lines show a slight distortion between supports. This is due to minor distortions in the purlins and valley blades. Numerous loose slates are apparent to the roof with several slipped and missing slates also apparent. This would indicate that nail fatigue is endemic with the roof now considered to be life expired and in need of renewal. The chimney stack would appear to have been rebuilt in the past using modern brickwork. No defects were apparent at the time of inspection.

The elevation to the lounge shows an outwards lean of generally 1.0% (10mm in 1.0m) increasing locally to 2.6% close to the wc. The bed joints show a slight vertical distortion on the older part of the property.

3.3 INTERNAL INSPECTION

3.3.1 Room 1 – Basement

The basement is accessed via a hidden stair within a store room adjacent to Room 2 Living Room. The basement has rendered masonry walls with a stone slab floor. The external walls are widened at their base. The floor over comprises joists supported by a large timber beam at mid span.



General view of basement.

During our initial inspection, the basement was full of water and inaccessible. Tide marks are clearly visible around the perimeter of the basement indicating that the water table is high.

The overall condition of the basement is considered to be fair/poor.

The floor over shows evidence of minor degradation and insect damage. No section losses are apparent.

A large crack up to 25mm wide is apparent extending for full height at the north east corner. The stone slab floor was noted as uneven throughout. Silt deposits are apparent throughout with significant deposits noted at the base of the stairs. A pipe is apparent at the north east corner which is used for de-watering.



Large crack to basement wall.

3.3.2 Room 2 – Living Room

The room is finished with painted plaster to walls, paper finishes to the ceiling and timber boards to the floor.

Severe cracking is apparent to wall finishes within the room. The cracking is concentrated close to the gable elevation. The cracking was noted as up to 5mm wide extending through areas of previous repair. Various repairs have been carried out in the past. However, it is apparent that the movement in the gable elevation is progressive.



Cracking to western elevation at ground floor.



Severe cracking to eastern elevation at ground floor.

The floor shows a significant run towards the north which is especially severe close to the elevation. The walls are very uneven but were generally plumb except for the gable elevation with shows a significant outwards lean.

3.3.3 Room 3 – Study

The room is finished with painted plaster to the walls and ceiling and a concrete floor.

Peeling paint finishes and debonded plaster were apparent to all external walls at low level. This defect is typical of rising damp. Removing the plaster finishes locally revealed damp brickwork behind.

Severe damp staining was apparent to the internal wall extending full height. This area is located to the rear of the feature fireplace in Room 4 and may indicate failed flashings.

The walls were noted as very uneven with the external walls showing a general outwards lean. The floor was noted as slightly uneven but generally level.



Severe damp staining to internal wall.

3.3.4 Room 4 – Sitting Room

The room is finished with painted paper finishes to the walls, quarry tiles to the ground floor and an exposed joisted floor construction over.

Peeling paint finishes and debonded plaster were apparent to all external walls at low level. This defect is typical of rising damp. Removing the plaster finishes locally revealed damp and loose brickwork behind in the lobby area. Severe rot and total section loss was apparent to a timber post adjacent to the entrance to the room.



Severe damp and loose brickwork.



Rot and total section loss to timber post.

Mould spotting is apparent to all of the floor timber over. This would confirm that the room has been very damp for an extended period.



Mould spotting to floor timbers.

The floor was noted as slightly uneven but generally level. The walls are very uneven but were generally plumb.

3.3.5 Room 5 – Back Kitchen

The room is finished with painted paper finishes to the walls, quarry tiles to the ground floor and an exposed joisted floor construction over.

Peeling paint finishes and debonded plaster were apparent to all external walls at low level. This defect is typical of rising damp.

Severe rot and total section loss was apparent to a timber post within the internal wall. Loose brickwork as apparent locally.



Rot and total section loss to timber post.

The floor was noted as slightly uneven but generally level. The walls are very uneven but were generally plumb.

3.3.6 Room 6 – Dining Room

The room is finished with partial paper finishes to the walls, partial carpet over quarry tiles to the ground floor and an exposed joisted floor construction over.

Peeling paper and paint finishes and debonded plaster were apparent to all internal walls at low level. In one area the brickwork has eroded at significant height above floor level. This defect is typical of rising damp. Adjacent to the fireplace, the damp staining extends for almost full height which may indicate leaking to the roof above.



Severe damp and eroded brickwork.



Peeling paper and paint finishes adjacent to fireplace.

The floor was noted as slightly uneven but generally level. The walls are very uneven but were generally plumb.

3.3.7 Room 7 – Kitchen/Breakfast Room

The room is contained within a fairly modern extension to the property. The room is finished with painted plaster to the walls and ceiling and tiled finishes to the floor.

Peeling paint finishes were apparent at low level to all of the external walls. Rotted skirting was apparent close to the external door opening. Very severe mould was apparent to the external wall within the washing machine alcove.



Rotted skirting adjacent to external door.



Very severe mould to washing machine alcove.

The floor was noted as generally level and the walls plumb.

3.3.8 Room 8 – Hallway

The room is finished with painted paper finishes to the walls, quarry tiles to the ground floor and an exposed joisted floor construction over.

Peeling paint finishes and debonded plaster were apparent to all external walls at low level. This defect is typical of rising damp.

Blown plaster and damp staining was prevalent to all walls at low level indicative of rising damp. Severe rot and total section loss was apparent to a timber post within the internal wall. Loose brickwork as apparent locally.



Rot and total section loss to timber post.

The floor was noted as slightly uneven but generally level. The walls are very uneven but were generally plumb.

3.3.9 Room 9 – Lounge

The room is finished with painted paper to the wall, painted plaster to the ceiling and quarry tiles to the floor.

Peeling paper finishes were apparent at low level throughout. Damp staining was noted to the tiled floor finishes at one end of the room which would suggest that water is penetrating the floor. The skirting was noted as rotted locally. Debonded plaster finishes were noted to the internal wall which would suggest that damp penetration is longstanding.



Blown plaster to internal wall.



Damp staining to floor tiles and rotted skirting.

The floor was noted as uneven with a distinct dip towards the rear elevation. The walls are very uneven but were generally plumb.

3.3.10 Room 10 – Bedroom 5

The room is finished with painted paper finishes to the walls and ceiling and boarded finishes to the floor.

Peeling/missing paper finishes were noted throughout. Plaster finishes to the end wall have been partially replaced in the past. However, debonded areas are apparent locally and to the other walls in the room.



Sever dip in floor and renewed plaster to end wall.

The floor has a distinct dip in the centre of the room. The walls are very uneven but were generally plumb except for the internal wall which leans towards the room at 1.5% (15mm in 1.0m).

3.3.11 Room 11 – Bathroom

The room is finished with painted paper finishes to the walls and ceiling and boarded finishes to the floor.

No significant defects were apparent at the time of inspection.

The floor has a distinct dip in the centre of the room. The walls are very uneven but were generally plumb.

3.3.12 Room 12 – Lobby

The room is finished with painted paper finishes to the walls, painted plaster to the ceiling and vinyl finishes to the floor.

The timber roof purlin over the room shows a significant sag down the slope. No cracking was apparent to the plaster finishes locally and the defect is considered to be longstanding.

The floor has a run to the external wall at 1% (10mm in 1.0m). The walls are uneven but were generally plumb except for the external wall which shows a general outwards lean at 1%.

3.3.13 Room 13 – Store Room

The room is finished with painted plaster finishes to the walls and ceiling and boarded finishes to the floor.

Damp staining was apparent to the external walls. Debonded plaster finishes were apparent throughout. Cracking up to 4mm wide was noted to the external and internal walls.

The timber roof purlin over the room shows a significant sag down the slope. No cracking was apparent to the plaster finishes locally and the defect is considered to be longstanding.



Damp staining, cracking and loose plaster to external wall.

The floor was noted as uneven with a distinct dip towards the rear elevation. The walls are very uneven but were generally plumb.

3.3.14 Room 14 – Bedroom 3

The room is finished with painted plaster to the wall and ceiling and boarded finishes to the floor.

Peeling paint finishes were apparent throughout the room with mould spotting apparent in several locations. Cracking and hollow areas were also apparent indicative of debonded plaster finishes.

Part of the ceiling finishes has delaminated adjacent to the internal valley. Staining and rot to timbers and section losses to the floor boards below would suggest a longstanding defect. At the time of inspection, a damp patch was apparent to the floor locally. A further area of previous water penetration was noted in the centres of the room. These defects would indicate that the roof coverings are have slipped.



Water penetration through valley.
NOTE: rot to timber locally.



Damp staining to floor with local section losses to boards.

The floor was noted as uneven with a distinct dip towards the centre of the room. The walls are very uneven but were generally plumb.

3.3.15 Room 15 – Bedroom 4

The room is finished with painted plaster finishes to the walls and ceiling and boarded finishes to the floor.

Cracked and debonded plaster finishes were apparent throughout the room. A delaminated section of plaster has exposed the timber framing to the internal wall. Severely rotted timbers are apparent locally, though this would appear to be limited to the infill between load bearing members.



Cracking to plaster finishes with rotted timber framing behind.

The floor was noted as uneven with a slight slope towards the side elevation. The walls are very uneven but were generally plumb.

3.3.16 Room 16 – Bedroom 2

The room is finished with painted paper finishes to the wall and ceiling and boarded finishes to the floor.

Peeling paper finishes were apparent throughout the room with mould spotting apparent in several locations. Cracking and hollow areas were also apparent indicative of debonded plaster finishes.

Part of the wall and ceiling finishes has delaminated due to water penetration from above. This would indicate that the roof coverings are have slipped.



Mould spotting to external wall.



Delaminated plaster finishes due to water penetration through roof.

The floor was noted as uneven with a distinct dip towards the centre of the room. The walls are very uneven but were generally plumb.

3.3.17 Room 17 – Bedroom 1 Master

Severe cracking is apparent to wall finishes within the outrigger at first floor level. Several cracks are apparent in both side elevations coincident with the tie bar anchoring points. The cracking was noted as up to 10mm wide. Various repairs have been carried out in the past. However, it is apparent that the movement in the gable elevation is progressive.



Severe cracking to western elevation.



Severe cracking to eastern elevation.

Gaps were apparent between the floor finishes and the gable elevation and the chimney breast and the ceiling. The gaps were noted as up to 60mm wide.



Gap between floor finishes and gable wall.



Cracking in plaster finishes and gap between chimney breast and ceiling.

The floor within the room shows a general slope at 3% towards the gable elevation increasing to 5% local to the wall. The side elevation walls were noted as generally plumb. The gable elevation shows an outwards lean at up to 8%.

3.3.18 Room 18 – Landing

The area is finished with painted plaster finishes to the ceiling, paper finishes to the walls and boarded finishes to the floor.

Mould spotting was apparent to the walls and ceiling throughout. An area of peeling paper finishes and delaminated plaster finishes were noted to the external wall above the stairs. This would appear to be due to weather penetration through the external wall.



Peeling paper finishes and delaminated plaster.

The landing floor was noted as uneven with a significant slope towards the head of the stairs. The walls are very uneven but were generally plumb.

3.3.19 Room 19 – Bathroom

The room is finished with painted plaster finishes to the ceiling, tiled finishes to the walls and boarded finishes to the floor.

Severe mould spotting was apparent to the walls and ceiling throughout. This is due to a lack of ventilation and the generally damp atmosphere within the property.



Severe mould spotting to walls and ceiling.

The floor was noted as uneven with a slight slope towards the side elevation. The walls are uneven but were generally plumb.

4.0 Discussion and Conclusions

The overall condition of the property is considered to be fair with sections of the embedded timber framing and the northern outrigger considered to be poor.

Severe cracking is apparent internally and externally within the northern outrigger which has resulted from movement in the end gable elevation. Following dewatering, an inspection of the basement revealed severe cracking in the north east corner and a very uneven floor. Tide marks to the walls indicate that the water table is very high. Significant vertical movement has occurred along the gable elevation causing the wall to rotate away from the property. A previous attempt to stabilise the gable has been only partially effective. Tie bars anchored back to the first floor have been installed. However, the movement in the wall has resulted in large forces in the ties which are causing the side elevations to separate at the anchoring points. The movement is significant and progressive. Photographs of the property from the mid-20th century show the previous structural interventions. This would confirm that the movement to the northern outrigger is a long standing issue which the previous interventions have failed to address.

Ground investigations (refer to Appendix D) have confirmed that the ground conditions comprise a thin layer of made ground (hardstanding and gardens) overlying firm becoming stiff and very stiff clay with rare gravel inclusions. Investigations within the basement have confirmed that the cellar walls sit directly onto wet slightly sandy clay at 150mm below floor level. The investigations have confirmed that the persistent transit of water through the basement over time has softened the clay locally and washed out fines resulting in the apparent movements. The abstraction of water by previous owners has exacerbated the issue.

In order to reduce the risk of foundation movement in the long term, the softer materials directly below the foundations should be removed and the width of the foundations increased to reduce the bearing pressures exerted on the formation. Given the stiffness of the underlying clay deep foundations, such as piling, will be difficult to implement. Therefore, mass concrete underpinning of the existing basement wall is considered to be the most appropriate solution. The clay sub soil has trapped surface water run-off resulting in a very high water table which flows into the basement. In order to safely carry out underpinning, any water entering the basement will need to be removed by pumping. For details of the proposed underpinning, refer to Appendix B.

The movement in the end gable has now reached a point where recently installed external propping could only be considered as a short term temporary measure. Therefore, in order to ensure long term stability, we would recommend that the northern outrigger be partially dismantled, the foundations stabilised and the walls, floors and roof then reconstructed using material salvaged during dismantling. Refer to Appendix B for a detailed summary of the proposed works.

Some minor cracking is apparent above and below openings in the elevations. This is due to minor foundations movement and a lack of lintels to other elevations. In properties of this vintage, it was common practice to support the brickwork over the openings using the window and door frames. Degradation to the frames over time has resulted in partial removal of the support. The majority of the elevations have been repointed in the past using cement mortar. Cement pointing will trap moisture in the wall which leads to spalling and will also create hard spots which can badly affect brickwork of this vintage. The lime pointing has eroded in areas and was noted as soft when probed. It would therefore be prudent to allow for repointing all of the elevations with lime mortar. The bed joints show slight distortion throughout which is consistent with minor foundation movement. The external walls were noted as slightly uneven

with some outwards leaning apparent. This is typically due to a lack of restraint at first floor level. The movement noted is considered to be generally historic.

Severe rising damp is apparent throughout the entirety of the ground floor accommodation. This has caused severe section losses to timber framing embedded within the walls, rot to timber skirtings, failure and debonding of internal plaster finishes and erosion of brick units. In several areas the mortar has broken down completely causing brickwork to become loose. No evidence of a dpc was apparent at the time of inspection and brick units of this vintage are known to be very porous. Any repairs to the internal and external walls will need to allow for the installation of a damp proof course alongside addressing external ground levels and providing gravel drains. As the bricks are very porous, we would recommend that a sheet system is used which will require a slot to be cut in all of the walls. Rotted timbers should be cut back to find solid timber and new sections installed in accordance with best conservation practice. Refer to Appendix C for typical repair details.

Plaster finishes throughout the property have delaminated from the brickwork. Long term degradation to plaster finishes can occur in all properties. The degradation is especially prevalent in older properties where issues of damp penetration, ineffective and inappropriate previous repairs such as cement pointing and a general lack of maintenance are common. All of the wall and ceiling finishes will need to be renewed as part of any refurbishment of the property.

Ground floor construction generally comprises quarry tiles which are typically laid over thin mortar screeds or laid directly onto ash or compacted earth. The tiled floors are uneven throughout which is not uncommon in properties of this age. A lack of an effective damp proof membrane can lead to damp penetration especially where a high water table is present. Evidence of significant damp penetration was apparent within Room 9 – lounge. In order to ensure that damp penetration is limited, it would be prudent to allow for the solid ground floors to be replaced incorporating an effective membrane which can be lapped up internal and external walls. Alternatively, a breathable limecrete floor system could be utilised though this would be dependent upon water table levels.

The roof alignment shows slight distortions between supports due to deformation of purlins and is not untypical in properties of this vintage. Some localised areas of staining were apparent to ceilings internally with areas of rot to timbers indicative of weather penetration which is likely as a result of missing or slipped roof slates, failing/deteriorating lead flashings in valleys and at roof junctions. Numerous repaired, slipped and loose slates are apparent throughout which is an indication that nail fatigue is endemic. To ensure long term durability, the roof finishes will need to be carefully taken down to allow for repairs to the roof timber where necessary. The existing slates can then be reinstated augmented by salvaged additional slate where necessary.

5.0 Recommendations

The following items should be addressed as part of any refurbishment of the main property:

- Carefully partially dismantle the northern outrigger taking care to limit damage to slates and masonry. Stabilise basement foundations by the installation of mass concrete underpinning. Allow for infilling basement with foamed concrete to prevent ground water from pooling. Rebuild outrigger using salvaged materials. See Appendix B for detailed summary of works to northern outrigger.
- Carefully remove slated finishes from roof and set aside for re-use. Carry out a visual inspection of the roof timbers and replace rotted sections as required. Reinstate slated finishes laid over a breathable membrane.
- Rake out joints to elevations to a minimum depth of 30mm. Repoint using a NHL3.5 prebagged lime mortar product rammed tight into the joints. Finish pointing flush with the elevation using a stiff brush.
- Install new sheet dpc to all external and internal walls. All works are to be carried out by a specialist contractor. As-installed system shall carry an insurance backed guarantee.
- Hack off all plaster finishes from walls and ceiling internally. Carry out repairs to brickwork and timbers as required. Install new lime plaster finishes to walls and plasterboard finishes to ceilings.
- Break up and excavate existing solid ground floors. Provide new ground floors incorporating a dpm and insulation to modern standards.

6.0 Limitations and Liability

This report has been prepared for the exclusive use of the commissioning party and unless otherwise agreed in writing by Andrew Hannett Limited, no other party may use, make use of or rely on the contents of the report. No liability is accepted by Andrew Hannett Limited for any use of this report, other than for the purposes for which it was originally prepared and provided.

Opinions and information provided in the report are on the basis of Andrew Hannett Limited using due skill, care and diligence in the preparation of the same and no explicit warranty is provided as their accuracy. It should be noted and it is expressly stated that no independent verification of any of the documents or information supplied to Andrew Hannett Limited has been made.

The timber or other parts of the building which are covered, unexposed or inaccessible to the Structural Engineer without the assistance of a ladder in excess of 3m have not been inspected. The report does not cover the condition of the dpc, possible damp penetration or condensation unless specifically highlighted as part of the inspection. Where the property was furnished at the time of inspection those elements of the structure covered over have not been fully inspected. Therefore, it is not possible to confirm that those elements are free from defect.

No excavations were undertaken to uncover buried elements or foundations and any notes on the condition of such elements are made based on the visible condition of the property. No intrusive testing was carried out. Manhole covers were not lifted and drains were not tested. Testing requiring the use of specialist equipment or training, e.g., electrical systems, gas appliances, water systems, etc., has not been undertaken.

This report is not intended to be an exhaustive list of all defects and only significant structural faults which could lead to instability of the structure in the present or future have been reported. Further defects may become apparent during more extensive investigation or during future refurbishment works.

Detailed calculations to determine the adequacy of structural members are outside the scope of this report and have not been undertaken. However, evidence of distress as a result of overloading or deterioration will be identified so that provision for additional works can be made during any future refurbishment scheme.

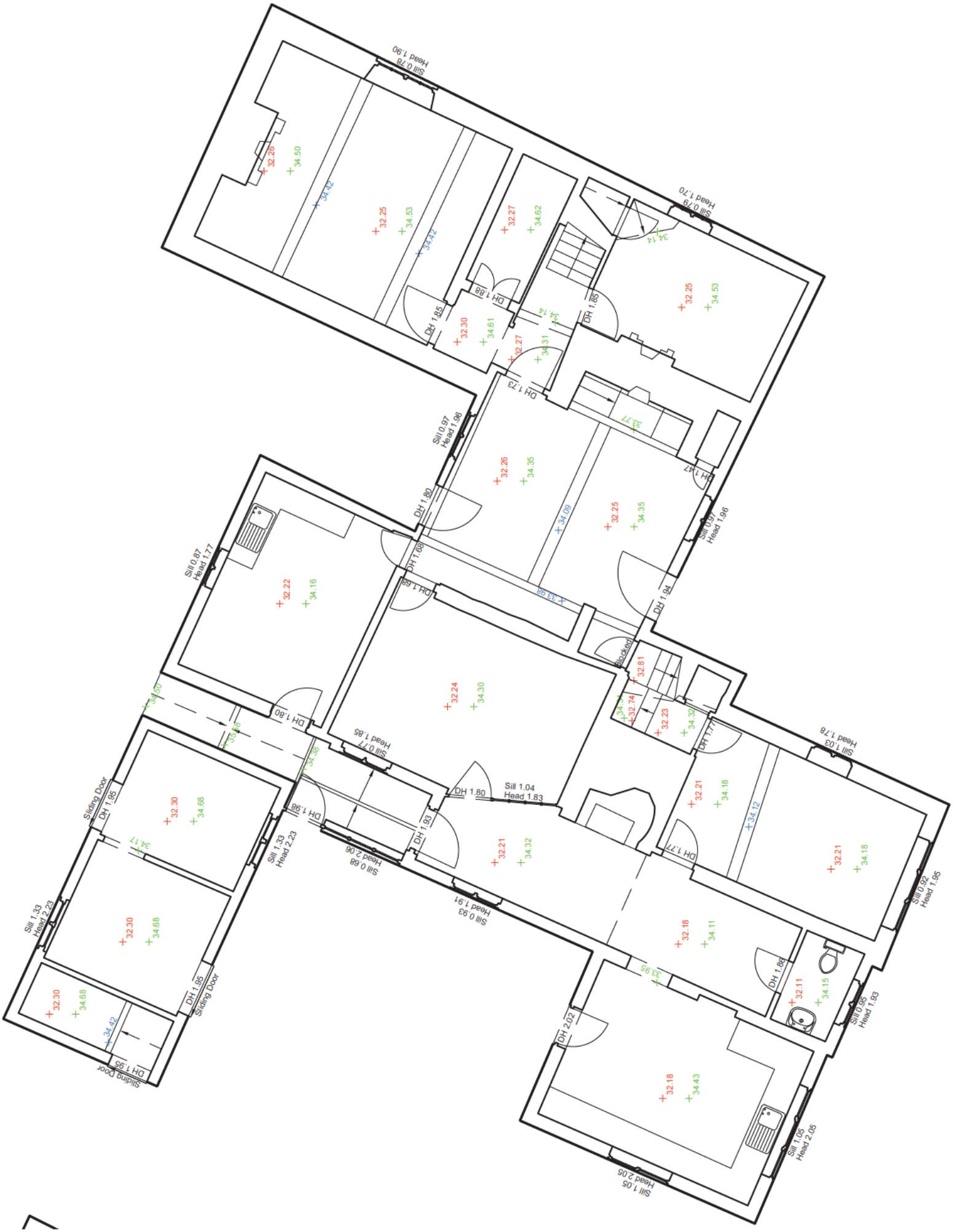
The report shall be solely used by the Client to determine the extent of works to the property and liability in this respect will be limited to the instructing Client.

Nothing in the Contract confers nor purports to confer on any third party any benefit nor any right to enforce any terms of this Contract pursuant to the Contracts (Rights of Third Parties) Act 1999.

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Appendix A – Reference Drawings


Outbuilding
Outbuilding
Outbuilding
Kitchen/Breakfast Room
7
Hallway
8
Lounge
9
Dining Room
6
Back Kitchen
5
Ground Floor
Sitting Room
4
Study
3
2
Living Room
11
Bathroom
12
Store Room
13
Bedroom 5
10
Bedroom 3
14
Bedroom 4
15
First Floor
Bedroom 2
16
18
Bedroom 1 Master
17
Bathroom
19


Sill 0.78
Head 1.90
Sill 0.79
Head 1.70
Sill 0.97
Head 1.96
Sill 0.87
Head 1.77
Sill 0.97
Head 1.96
Sill 1.03
Head 1.78
Sill 1.04
Head 1.83
Sill 0.77
Head 1.85
Sill 0.68
Head 2.06
Sill 0.93
Head 1.97
Sill 1.33
Head 2.23
Sill 1.33
Head 2.23
Sill 0.92
Head 1.95
Sill 0.95
Head 1.93
Sill 1.05
Head 2.05
Sill 1.05
Head 2.05
Sliding Door
Sliding Door
Sliding Door
Blocked
DH 1.80
DH 1.85
DH 1.88
DH 1.73
DH 1.80
DH 1.68
DH 1.68
DH 1.94
DH 1.47
DH 1.80
DH 1.98
DH 1.93
DH 1.77
DH 1.77
DH 1.86
DH 2.02
DH 1.95
DH 1.95
32.26
34.50
34.42
32.25
34.53
34.42
32.27
34.62
32.30
34.61
32.27
34.31
34.14
32.25
34.53
33.77
32.26
34.35
34.09
32.25
34.35
33.98
32.22
34.16
34.50
33.98
34.39
32.24
34.30
32.81
32.74
34.39
32.23
34.39
32.21
34.18
34.12
32.21
34.18
32.30
34.68
34.17
32.30
34.68
32.21
34.32
32.18
34.11
33.95
32.11
34.15
32.30
34.68
34.42
32.18
34.43


Sill 0.77
Head 1.96
34.66
36.80
34.66
36.82
34.77
36.88
DH 1.83
34.46
36.85
DH 1.74
Sill 0.67
Head 1.67
34.45
36.69
36.46
36.10
DH 1.76
DH 1.68
35.66
36.41
34.40
36.52
36.39
36.11
Sill 0.55
Head 1.47
DH 1.72
35.78
36.50
Sill 0.68
Head 1.82
34.22
36.35
DH 1.68
Assumed Boiler Position
34.34
36.38
34.35
36.38
DH 1.75
34.39
36.30
DH 1.75
Sill 0.66
Head 1.52
36.50
36.10
DH 1.75
Sill 0.40
Head 1.30
36.38
34.36
35.28
34.37
36.42
DH 1.68
36.30
34.17
35.30
34.17
35.30
Sill 0.60
Head 1.40





Datum 30.00m Elevation 5



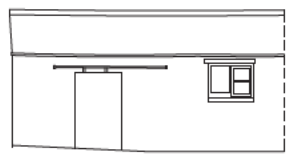
Datum 30.00m Elevation 6



Datum 30.00m Elevation 7



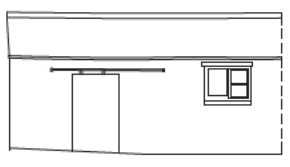
Datum 30.00m Elevation 8



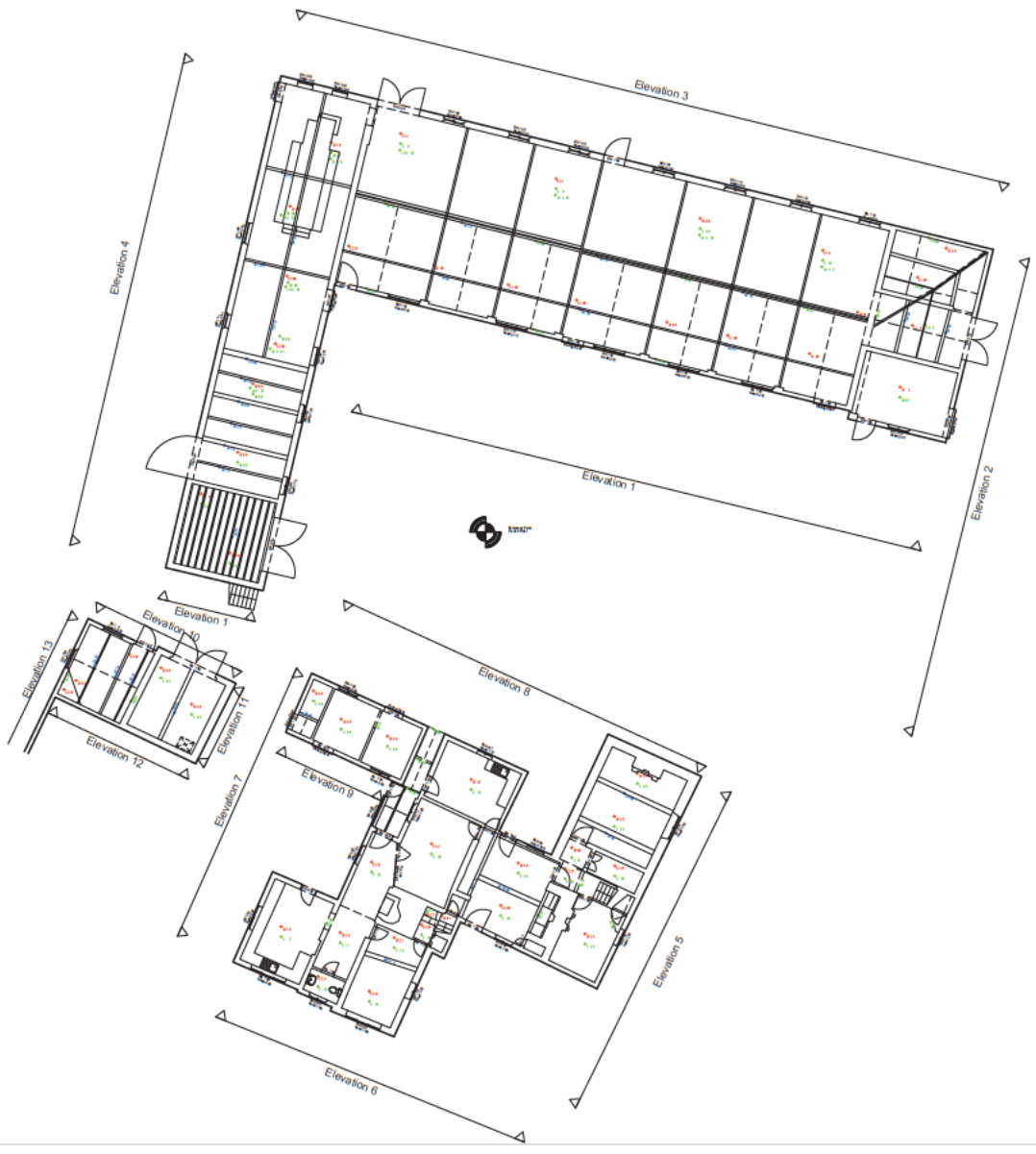
Datum 30.00m Elevation 9



Datum 30.00m Elevation 8



Datum 30.00m Elevation 9



Floor Plan Abbreviations & Legend

AH	ARCH HEIGHT	MH	MANHOLE
BH	BEAM HEIGHT	OH	OPENING HEIGHT
CH	CEILING HEIGHT	OVH	OVERHEAD
CU	CONSUMER UNIT	ST	STOP TAP
DH	DOOR HEIGHT	TOC	TOP OF COLUMN LEVEL
F/C	FALSE CEILING HEIGHT	TOW	TOP OF WALL LEVEL
G	GULLY	U/S	UNDERSIDE

FL 50.21 FINISHED FLOOR LEVEL
BL 53.69 UNDERSIDE BEAM LEVEL
CL 54.42 UNDERSIDE CEILING LEVEL/FALSE CEILING

EXTERNAL BUILDING LINE (FOOTPRINT)
INTERNAL WALL LINE
CEILING LINE/CHANGE CEILING LEVEL
BEAM LINE
WINDOW
SLOPING CEILING LINE
SINK (SYMBOLIC) NOT TO SCALE
STAIRS/STEPS
TOILET (SYMBOLIC) NOT TO SCALE
RAMP
URINAL (SYMBOLIC) NOT TO SCALE
SINGLE STEP
SHOWER (SYMBOLIC) NOT TO SCALE
DOOR SWING (SYMBOLIC)
SECTION LINE

Technical Notes:

- All survey levels and co-ordinates are related to OS Datum using the GPS Active Network. The Grid is orientated to Grid North with a Scale Factor of 1.00.
- Critical Dimensions, Steel Sizes and Heights MUST be checked on site prior to construction.
- Above ground features and heights have been measured from floor level using non-contact methods. Actual heights and sizes may vary owing to end point definition.
- Wall finishes are, in places, uneven. Therefore, measurements have been taken to the best fit corners. This may mean wall thickness may vary from that shown.
- Wall measurements where possible have been taken to the main face at approx 1.5m above floor level.
- Levels shown to Ceilings/Beams/portal Frames/Wind Bracing/Ducts are taken to underside unless specified.
- Radiators and other M&E Apparatus including pipework, ducting, cables, switches/sockets have not been shown.
- Some areas of the building may have been inaccessible at the time of survey, details in these areas have been omitted or are approx but will have been noted accordingly.
- Some Window, Door and Architectural detailing may have been simplified for clarity
- Do not scale from this drawing.

DO NOT SCALE OFF THIS DRAWING

1:50 - 0 1m 2m 3m 4m 5m
1:100 - 0 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m
1:200 - 0 2m 4m 6m 8m 10m 12m 14m 16m 18m 20m
1:500 - 0 10m 20m 30m 40m 50m

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redbox SURVEYS

Client:
Poplar Properties

Project:
Pickhill Farm
Wrexham LL13 0UL

Drawing Title:
Elevations

Rev.	Description	Surveyed	Approved	Date

Surveyor:	Checked By:	Approved By:	Date of Survey:	Date of Issue:
ART	BB	AJS	02/11/23	23/11/23
Drawing Status:	Scale:	Paper Size:	Sheet No:	
FINAL	1:100	A1	4 of 5	
Project No:	Drawing No:	Revision:		
RBS - 23/3492	RBS - 23/3492/001	-		

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Appendix B – Northern Outrigger Stabilisation

Introduction

The Northern Outrigger shows evidence of severe cracking internally and externally as a result of foundation movement at the gable end. The movement has been caused by the persistent transit of water through the basement over time which has softened the clay locally and washed out fines. The abstraction of water by previous owners has exacerbated the issue.

As a temporary measure, propping has been installed on the gable end until permanent works can be implemented. In order to ensure the long term viability of the outrigger, the movement in the foundations will need to be abated. This can be achieved by improving the foundations and preventing the transit of water under the basement walls.

Foundation Stabilisation Options

Ground investigations have confirmed that the formation immediately below the basement walls has been softened over time by the transit of water which has also removed fines locally. In order to stabilise the foundations, the bearing capacity of the formation will need to be improved.

Multiple options for improving formations are available:

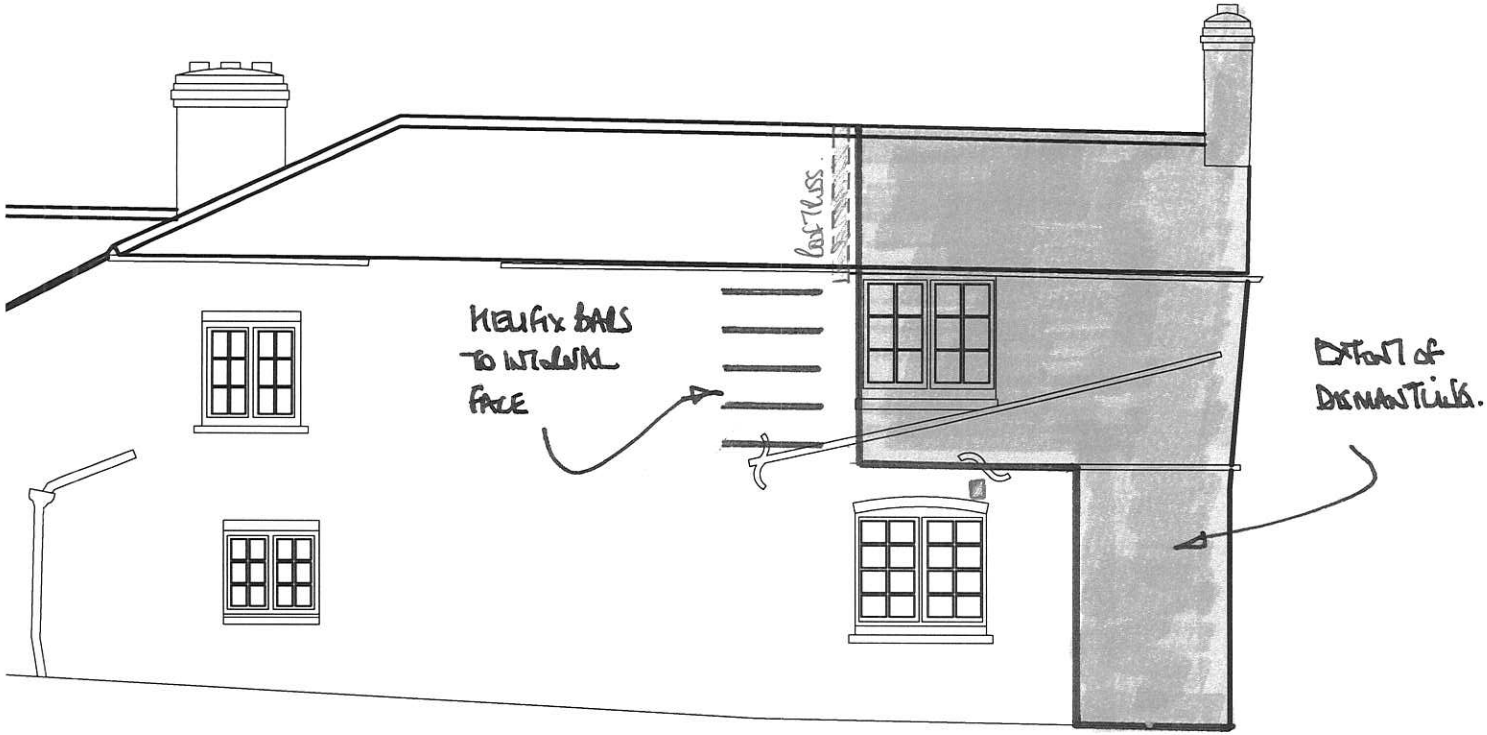
- Mass Concrete Underpinning. This method removes soft material directly below the foundations whilst also increasing foundation width. This is the most commonly used method as it requires no specialised plant or trained operatives often making it the cheapest solution. A staged installation method is required to ensure that the building remains stable during the works which increases the time required to complete the works. Given the high water table locally, water will need to be pumped from the basement during the works to protect workers.
- Resin Injection. Expanding resin is injected into the ground below the foundations through copper pipes inserted through the ground. After resin is injected, it expands to form columns within the ground stabilising and improving the bearing capacity of the formation. This method requires specialised plant and trained operatives and is better suited to projects where direct access to the foundations is difficult. Given that stiff clay is apparent below formation level, this method will have limited application.
- Jet Grouting. A high velocity jet of cement grout is used in the creation of geometry of grouted soil. Jet grouting is typically used to create columns of grouted soil underneath an existing foundation. This method is effective across a variety of soil types. Jet grouting is also an effective method of underpinning as there is no need for load transfer structures. However, because jet grouting requires drilling and the use high-pressure, it is not always suitable for very sensitive foundations due to the soil disturbance caused.
- Piled Needle Beams. This method is more applicable to situations where poor ground conditions extend to depth. Piles tend to be of small diameter and are installed by driving steel tubes or precast concrete rods into the ground. Loads are transferred to the piles by the provision of reinforced concrete needles inserted through the supporting walls at close centres. This method requires specialised plant and trained operatives and tends to be the most expensive option.

Given that the underside of the foundations is readily accessible within the basement, the preferred solution is mass concrete underpinning. Provision will be required for pumping water from excavations during the works.

Proposed Works

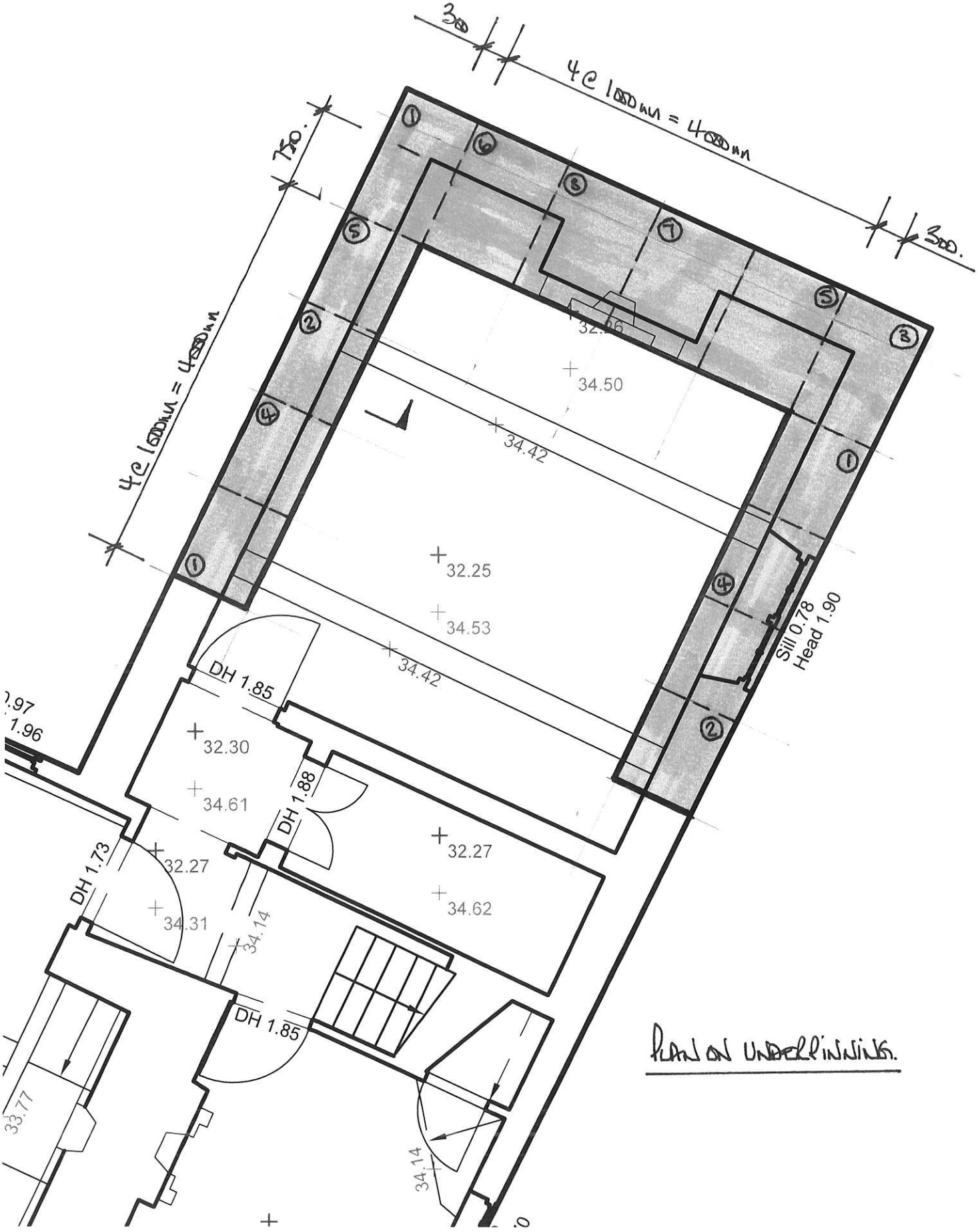
The works to the outrigger will need to be controlled to prevent destabilising retained elements. The following approach should be to safeguard the building during the works:

- Erect access scaffold to the full perimeter of the outrigger. Scaffold shall incorporate multiple levels to provide access to the full height of the walls and the roof. Scaffold shall incorporate bracing to all levels with horizontal boards placed tight against the elevations.
- Stabilise cracking to the internal face of the side elevation walls by the installation of stainless steel bars in accordance with the manufacturer's specification. All bars shall be 1000mm long and installed at 450mm centre vertically. Indicative locations for the bars are shown on the enclosed sketches.
- Carefully strip slating from the roof. All materials shall be sorted and safely stored at site for possible re-use.
- Carefully dismantle chimney stack above roof level.
- Carefully dismantle rafters and purlins to roof extending from the retained truss to the gable elevation. All materials shall be sorted and safely stored at site for possible re-use.
- Carefully dismantle external elevations down to first floor level. The assumed extent of dismantling is indicated on the enclosed sketches. Please note: the exact extent of dismantling will need to be confirmed at site by assessing the stability of retained elements. Any increases in extent will need to be agreed with the Conservation Officer PRIOR to implementation. All materials shall be sorted and safely stored at site for possible re-use.
- Carefully dismantle first floor construction from the retained floor support beam to the gable elevation. All materials shall be sorted and safely stored at site for possible re-use.
- Carefully dismantle external elevations down to ground level. The assumed extent of dismantling is indicated on the enclosed sketches. Please note: the exact extent of dismantling will need to be confirmed at site by assessing the stability of retained elements. Any increases in extent will need to be agreed with the Conservation Officer PRIOR to implementation. All materials shall be sorted and safely stored at site for possible re-use.
- Install mass concrete underpinning to stabilise foundations. Refer to enclosed sketches for the extent of and details for the underpinning.
- Fill voids below ground level in the basement with foamed concrete.
- Rebuild external walls to ground floor level using salvaged materials laid in a NHL3.5 prebagged lime mortar product mixed with water.
- Reinstate timber ground floor construction using salvaged materials augmented by new timbers as required.
- Rebuild external walls to first floor level using salvaged materials laid in a NHL3.5 prebagged lime mortar product mixed with water.
- Reinstate timber first floor construction using salvaged materials augmented by new timbers as required.
- Rebuild external walls to roof level using salvaged materials laid in a NHL3.5 prebagged lime mortar product mixed with water.
- Reinstate roof construction using salvaged materials augmented by new timbers as required.


HELIFIX BARS
TO INTERNAL
FACE
EXTENT OF
DEMOLITION.


Extent of
Dismantling.

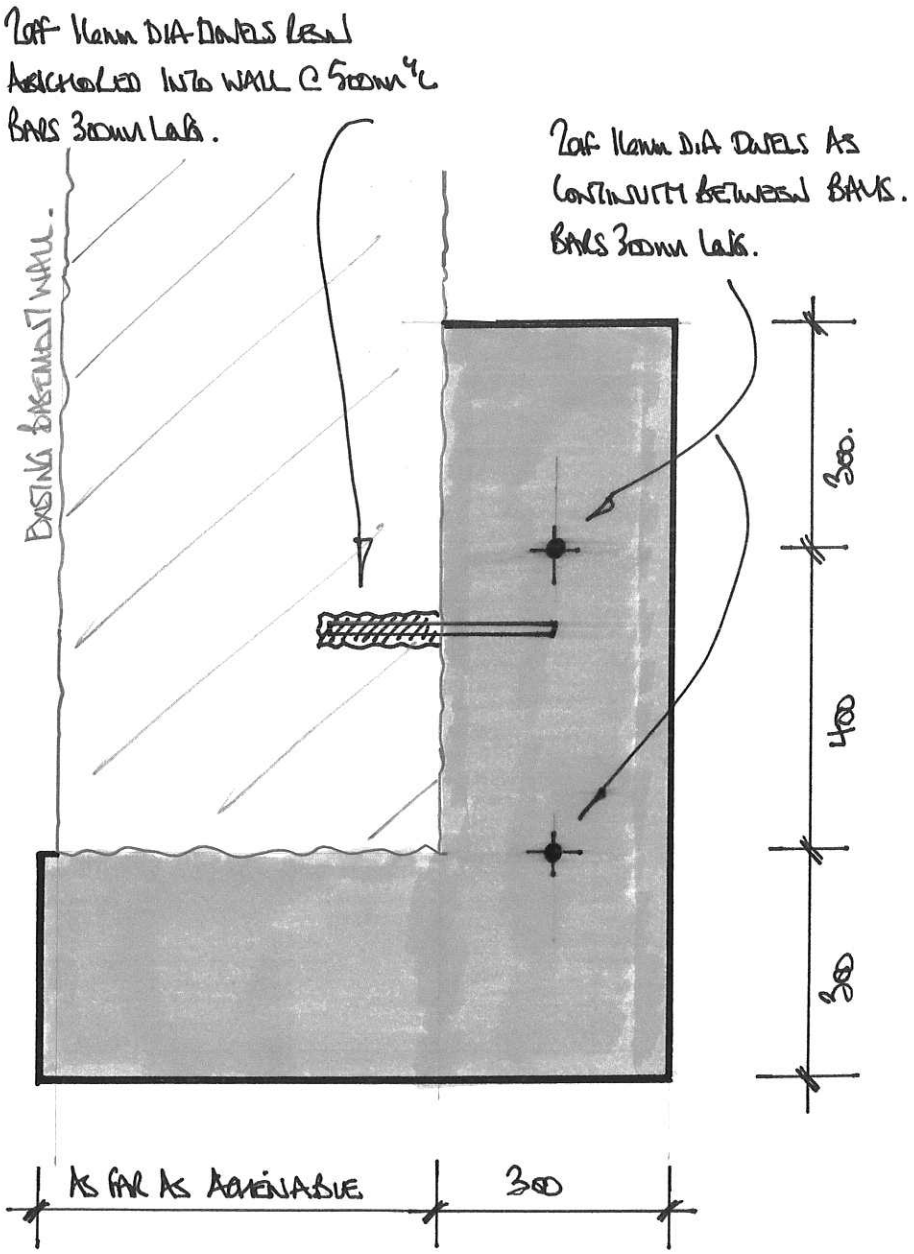

Roof Pass.
Heating Pipes To
Internal Gable



PLAN ON UNDERPINNING.

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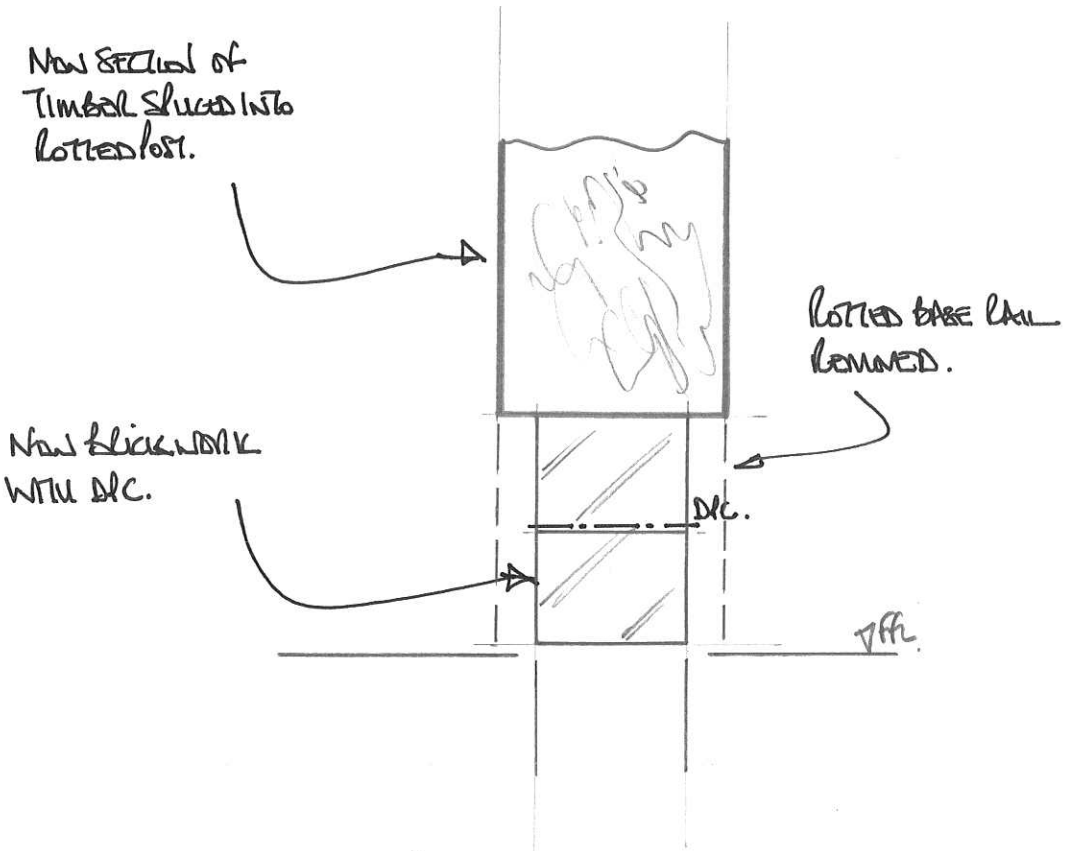


TYPICAL UNDERPINNING DETAIL

Appendix C – Typical Repair Details

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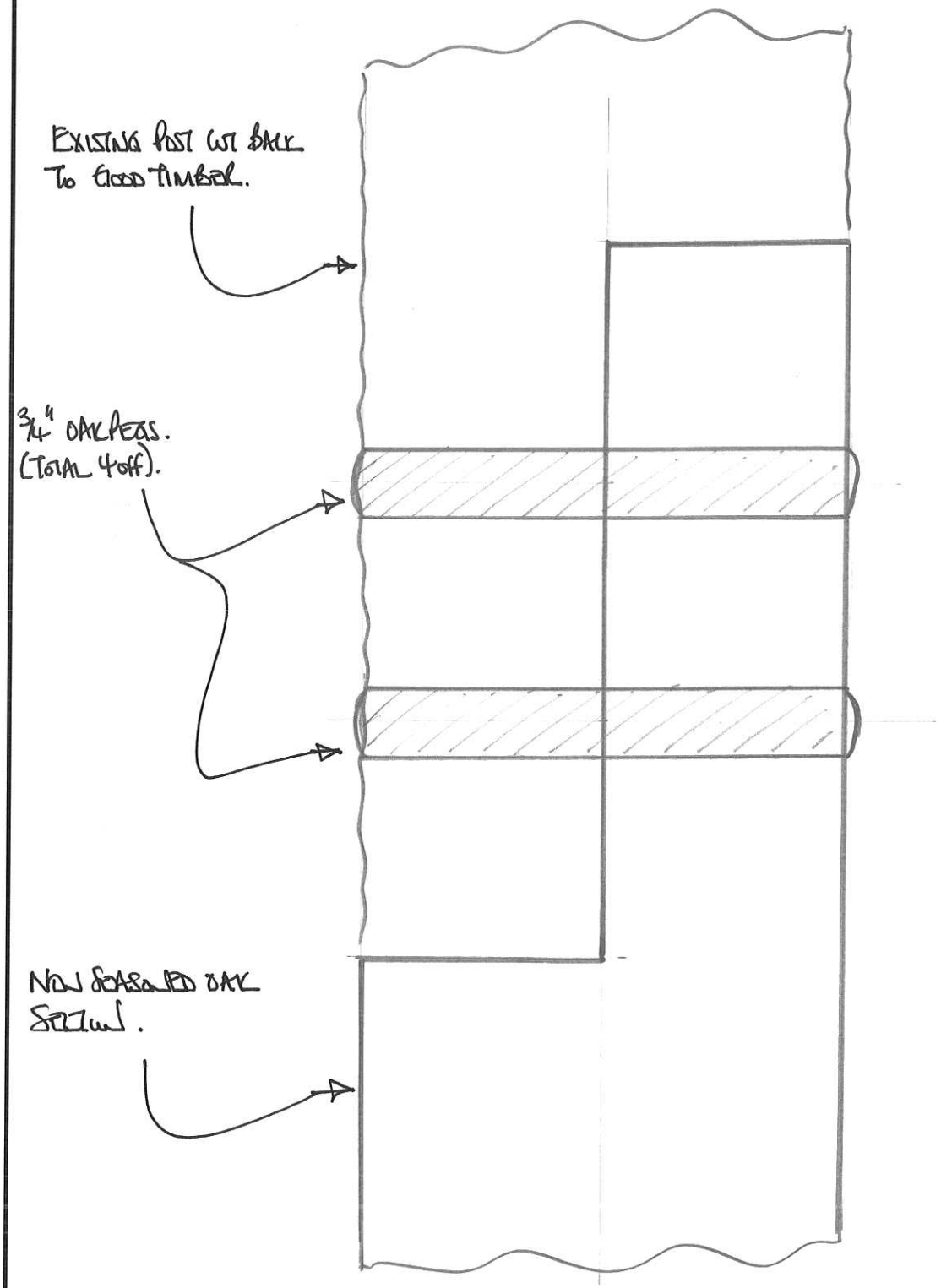
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ROTTED BASE RAIL REPLACEMENT.

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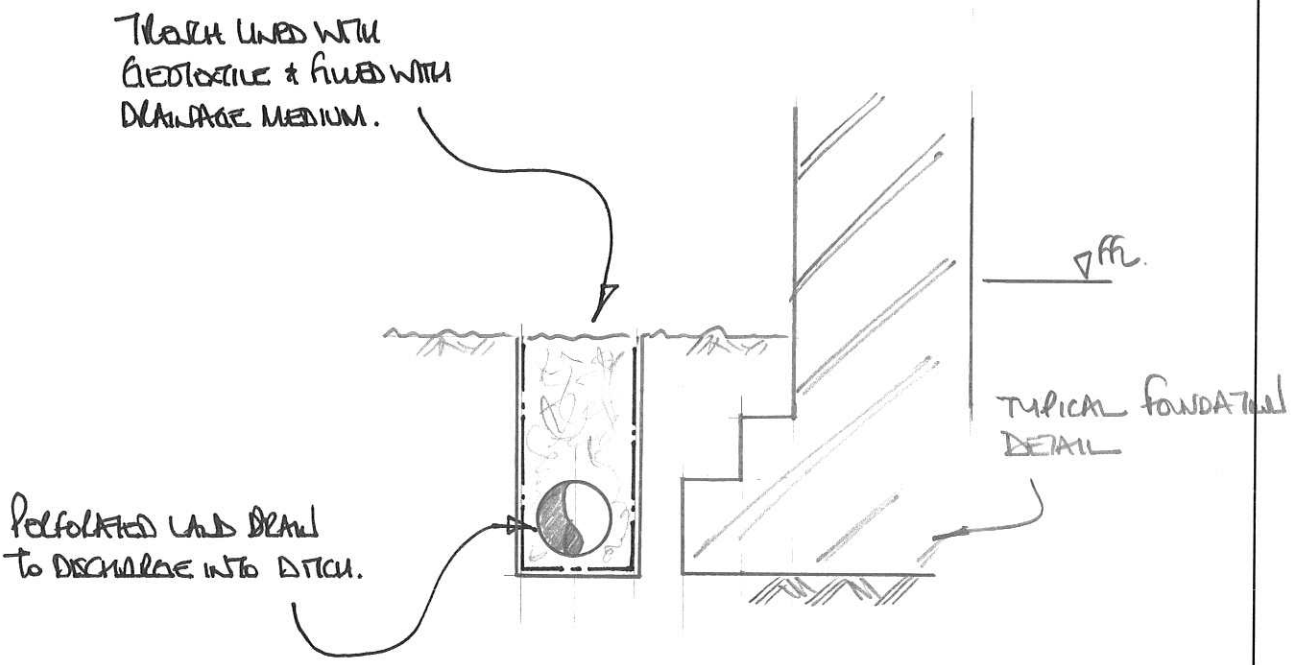
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HALF LAP JOINT. TO POST.

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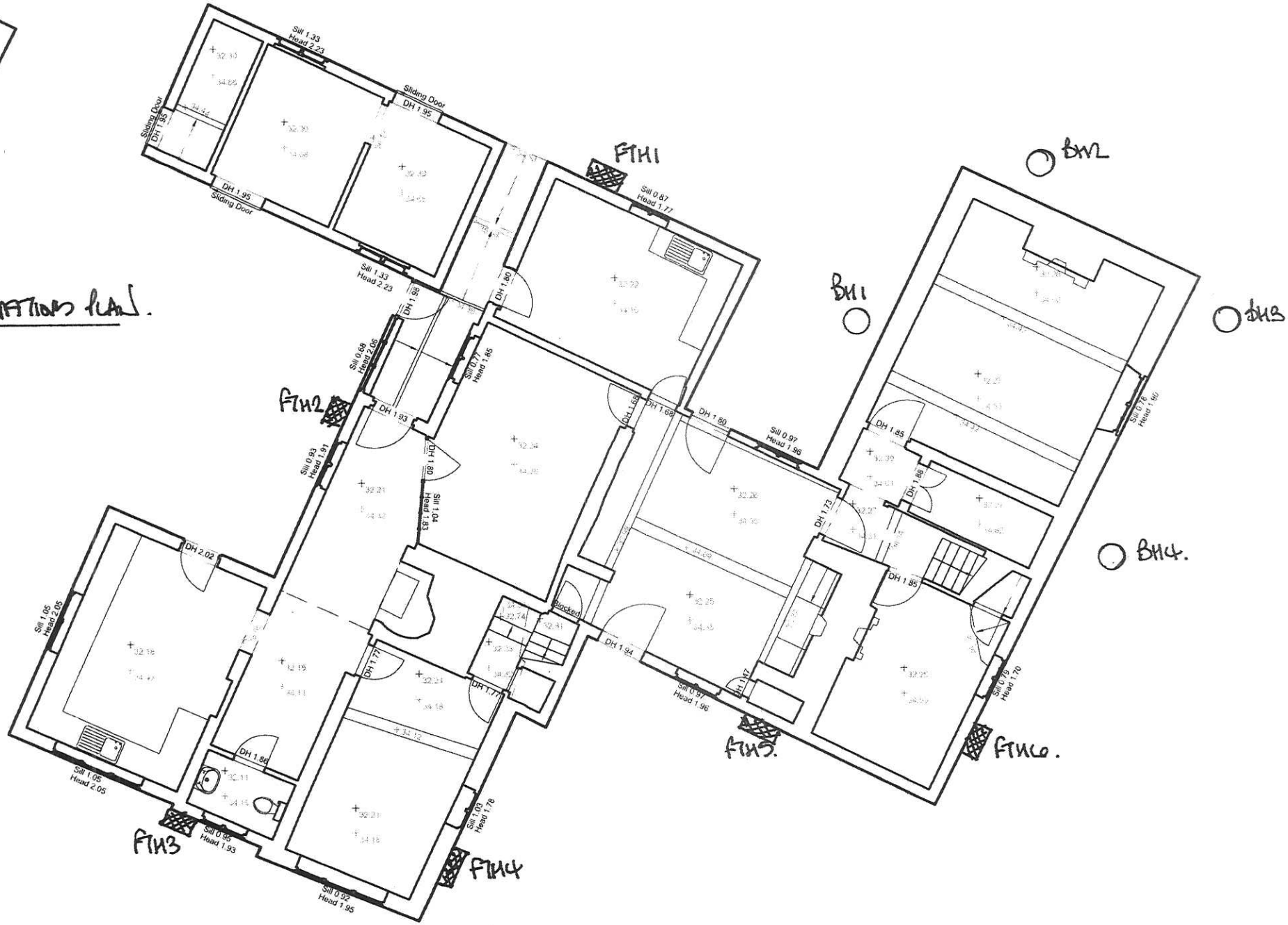
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LAND DRAIN DETAIL.

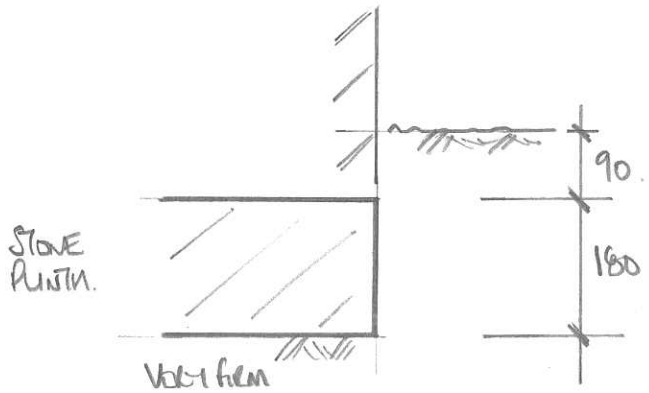
Appendix D – Ground Investigation Reports

INVESTIGATION PLAN.

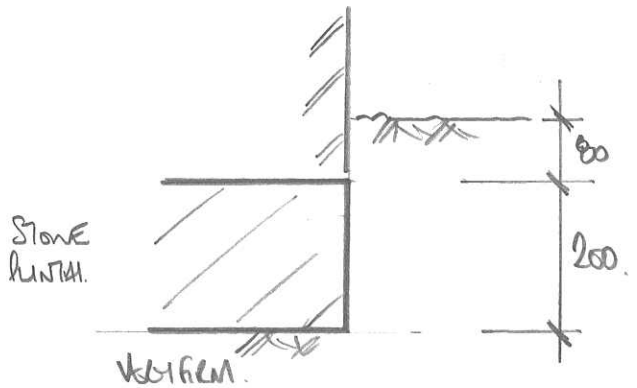


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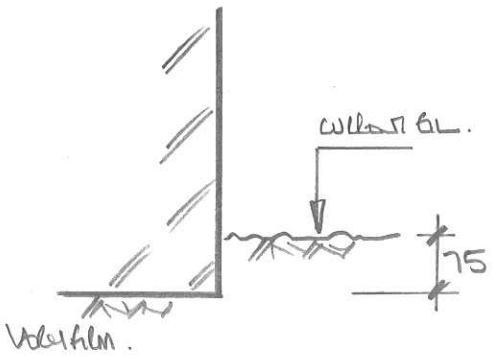
TRIAL HOLE FIG1.



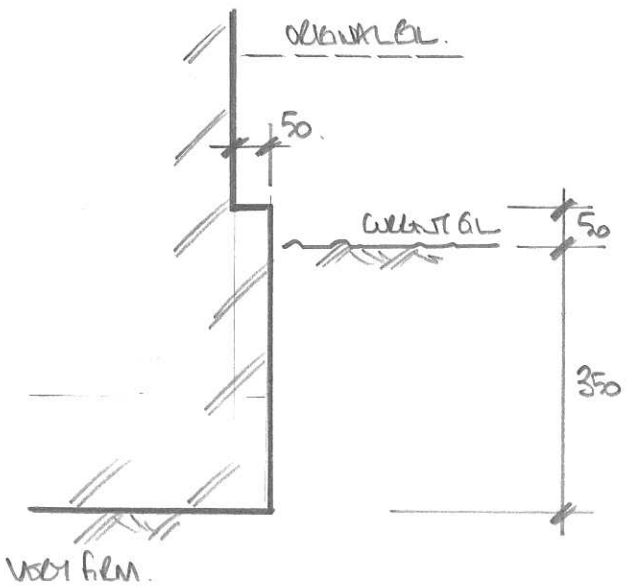
TRIAL HOLE FIG2.

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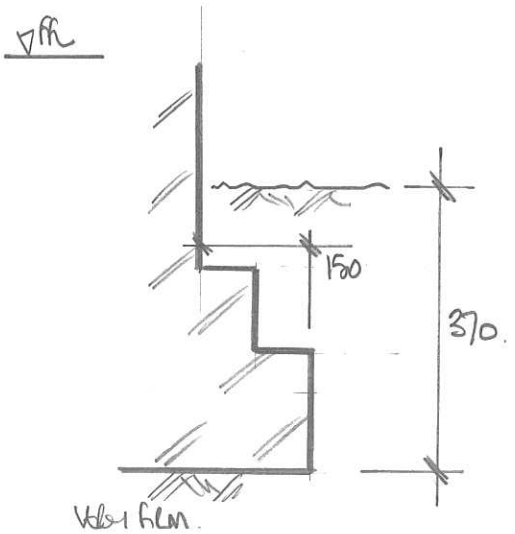
TRIAL HOLE TH3.



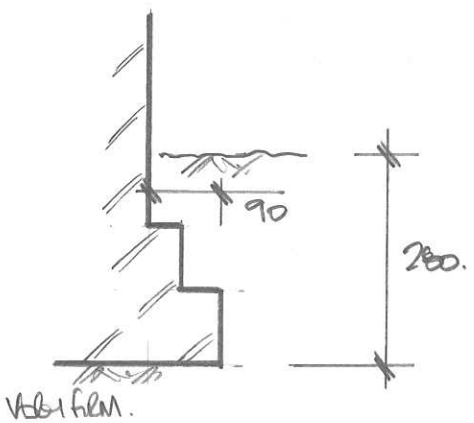
TRIAL HOLE TH4.

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TRIAL HOLE FH5.



TRIAL HOLE FH6.

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Fax: 0151 630 5884

admin@auger.co.uk
www.auger.co.uk

Site Investigation Report

Auger Ref:

133941.2.USI



Job Information	
Client	Sedgwick
Client ref	9486267
Visit date	11/11/2022
Report date	17/11/2022

Job Summary

- CCTV survey undertaken. Read more.
- 1 trial hole undertaken. Read more.
- No drainage defects found. Read more.

Job Information

Overview

Brief	Auger were commissioned by Sedgwick to undertake a site investigation and CCTV inspection of the underground drainage within the area of concern (AOC) at the property.

Findings

Trial Hole Findings	The proposed location of the trial hole was on the rear external wall of the cellar. However given there was a 2m deep cellar in this location we decided to move the trial hole internally. During the internal trial hole our engineer exposed the footings of the rear wall and side wall, these were seen to be identical and can be seen in the log below. During the trial hole we noted ground water entering the cellar, this would then disperse into the ground and this process was continual meaning the surface of the cellar was damp/wet clay.
Drain Survey	We carried out a CCTV survey of the below ground drainage system, our findings of which are as follows: **Line 1 - From RWG1 downstream to Outside AOC** Our survey of line 1 revealed no significant defects to the pipework on this line which could be allowing an escape of water. Within the gully pot the aboveground downpipe is not directly expelling into the pot, the reason being there is a pumping chamber adjacent to the side wall of the cellar, the outfall of the chamber is an aboveground pipe expelling into this gully (refer to images below). The chamber appears to have an invert of 1.95m and is moving ground water from this location into the sewer. **Line 2 - From RWG2 downstream to Line 1** Our survey of line 2 revealed no significant defects to the pipework on this line which could be allowing an escape of water. **Line 3 - From Surface water pipe downstream to external wall** Within the cellar adjacent to the trial hole there appears to be a flat clay pipe, starting internally this runs 800mm through the wall to the external ground and just stops dead. This drain from our understanding only appears to be allowing water to leave the cellar and vice versa.

Recommendations

Refer Back to Client	Lines 1 and 2 are plastic and appear to be water tight. In respect to line 3, this drain appears to be of no significance and is allowing water to enter/ leave the cellar. The Building Consultant should decide whether to alter/ remove the pipework.

Photographs

Trial Hole 1

Fig 1.1: Trial Hole 1 Location



Fig 1.2: Trial Hole 1 Footing



Fig 1.3: Trial Hole 1 footing



Site Photos

Fig 3.1: External pumping chamber



Fig 3.2: Drain within the cellar serving no significant purpose



Fig 3.3: Gully serving the overflow from pumping chamber



CCTV Survey – Inspection Listings *(WRc Guidelines Applied)*

line1

Direction	Downstream	**From**	rwg
Pipe Size (mm)	100	**Depth (m)**	0.1
Pipe Material		**To**	front

0.0m	Line of Sewer Deviates Right
0.5m	Line of Sewer Deviates Left
1.2m	Connection
1.4m	Line of Sewer Deviates Right
8.6m	Connection (rwg 2 conn)
11.5m	Finish of Survey Length (beyond aoc)

line2

Direction	Downstream	**From**	rwg
Pipe Size (mm)	100	**Depth (m)**	0.1
Pipe Material		**To**	front

6.7m	Connection (line1)

line3

Direction	Downstream	**From**	swp
Pipe Size (mm)	100	**Depth (m)**	0.1
Pipe Material	VC	**To**	

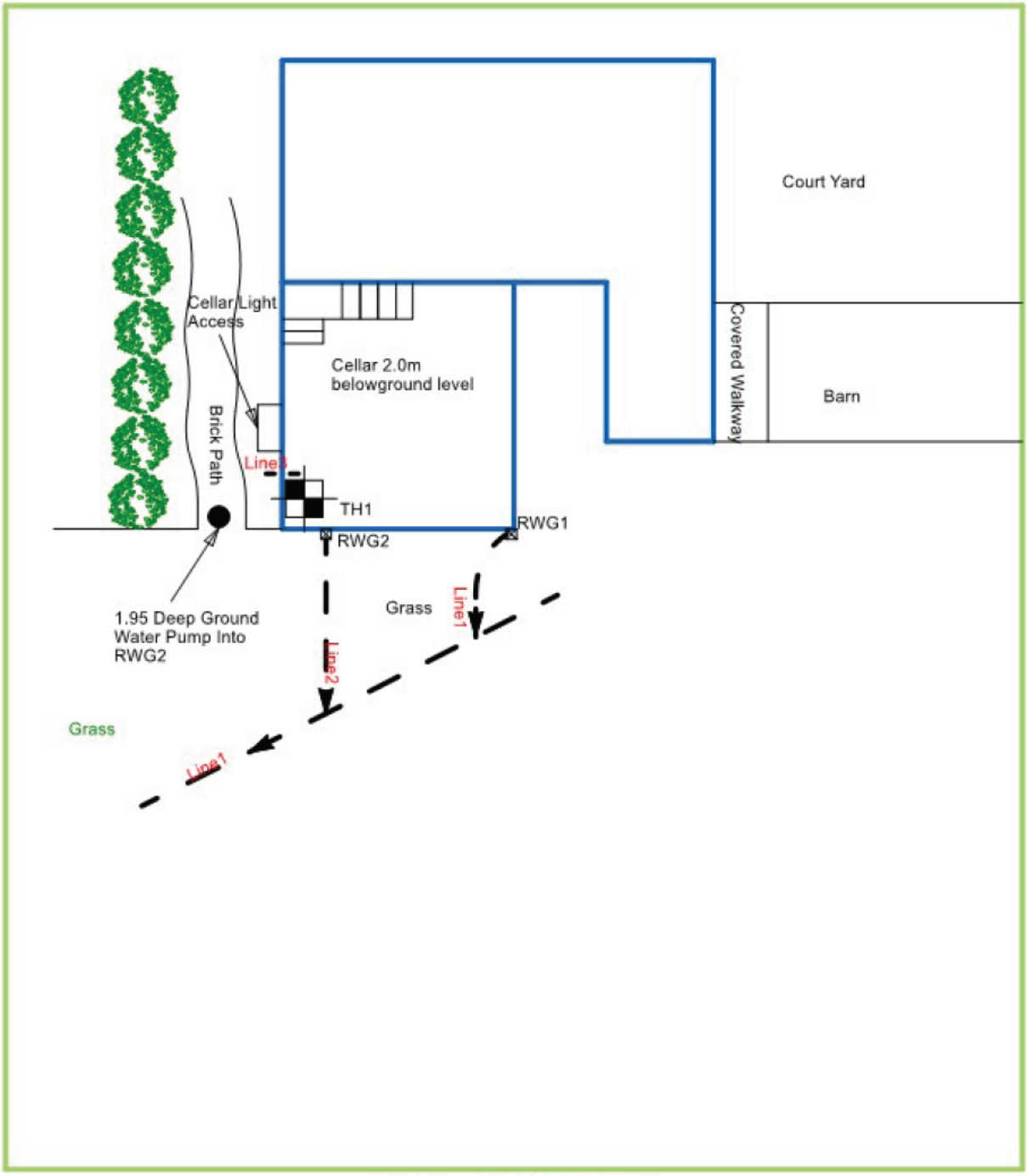
0.0m	Start of Survey
0.8m	Survey Abandoned

auger

Existing Layout

Job Ref: 133941.1

Date: 11/11/2022



FRONT OF PROPERTY

This drawing should be used for diagrammatic purposes only. Auger are not responsible or liable for any 3rd party works undertaken using the details outlined in this drawing. Confirmation of the drainage configuration can only be confirmed by excavation or detailed technical survey.

LEGEND

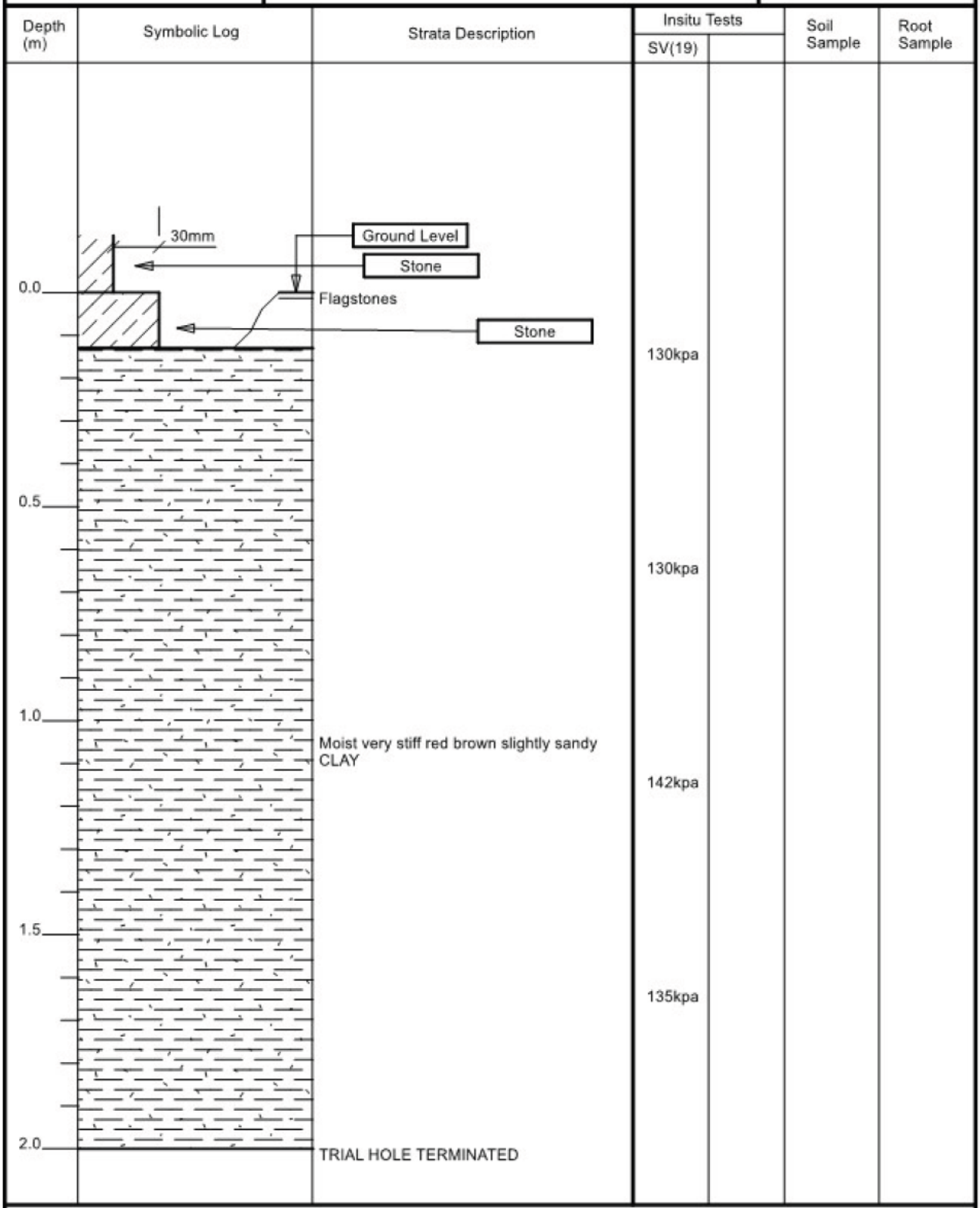
- = Manhole (MH)
- = Inspection Chamber (IC)
- = Inspection Point (IP)
- = Blockage / Collapse
- = Soil Vent Pipe (SVP) / WC
- = Combined Waste Gully (CWG) / Foul Waste Gully (FWG)
- = Rainwater Gully (RWG)
- = Rainwater Pipe (RWP)
- = Lines not camera surveyed
- = Lines camera surveyed
- = Assumed water mains feed
- = Walls
- = Fences
- = Building Outline
- = Trial hole
- = Borehole
- = Direction of flow
- = Gate / Door
- = Shrubs / Bush
- = Hedge
- = Tree
- = Steps

auger

Trial Hole Log No.1

Location: Rear wall of cellar

Job Ref: 133941.2.USI



Shire

01527 579933
engineers@shire-uk.com | www.shire-uk.com
The Chapel | Barnsley Hall Road
Bromsgrove | Worcestershire | B61 0SZ

Ground Investigation

Investigation to determine the ground conditions. This comprised of four window sample boreholes with in situ strength testing and laboratory soil analysis.

Site Details

Site Date	**29th August 2025 & 11th September 2025**
Client	**Sedgwick**
Policy Holder & Address	**Jones – Pickhill Farm, Pickhill, Cross Lanes, Wrexham, LL13 0UL**
Reference number	**9486267**
Shire Reference	**SS-25-14187/G1-2**

General Conditions

The site work and report has been carried out in accordance with BS 5930: 2015 "Code of practice for ground investigations."

Any soil samples taken are either retained or dispatched to a UKAS accredited laboratory for testing. The tests are carried out in accordance with the methods outlined in BS 1377: 1990 "Methods of test for soils for civil engineering purposes."

If required, any root samples taken are sent to the European Plant Science Laboratory for identification.

Drainage investigations are carried out in accordance with WRc publication 'Manual of Sewer Condition Classification – 5th Edition', and BS EN 13508-2003.

[redacted]

Report prepared by: Rob Ray BSc(Hons) Env Eng



ORIGINAL DRAWING SIZE A4

Claim Number
9486267

Customer Name
JONES

Date	Scale	Job No	
29/08/25	NTS	SS-25-14187	
Drawn	Checked	Drawing No	Issue
JS	RR	LP1	A

Address
PICKHILL FARM
PICKHILL
CROSS LANES
WREXHAM LL13 0UL

Drawing Title
LOCATION PLAN No.1

Shire structures
The Chapel, Barnsley Hall Road
Bromsgrove, Worcestershire, B61 0SZ
Tel: (01527) 579933
Fax: (01527) 559700
Web: www.shire-uk.com

Borehole Log

BH1

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
BH	339171.00	347803.00	32.73	1:50

Project Name	Project No.	Start Date	End Date
Pickhill Farm	SS-25-14187	2025-10-11	2025-10-11

Client Sedgwick

Consultant Rob Ray

Contractor Shire Structures

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Type/ Ref	Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Description
					32.43	(0.30) 0.30		MADE GROUND: Disturbed brown gravelly CLAY. Gravel is sandstone/limestone.
		1.00	HV	N/A (kPa)				Stiff becoming very stiff reddish brown silty CLAY with occasional fine sub-rounded gravel, grey veining and decayed roots.
		2.00	HV	110 (kPa)		(2.70)		
		3.00	HV	150+ (kPa)	29.73	3.00		Very stiff becoming hard reddish brown silty CLAY with rare gravel and grey grey veining.
		4.00	HV	150+ (kPa)				
		5.00	HV	150+ (kPa)		(4.70)		
		6.00	HV	150+ (kPa)				
		7.00	HV	150+ (kPa)				
		7.70	HV	150+ (kPa)	25.03	7.70		*End of Borehole at 7.70m*

Remarks
Borehole terminated at 7.7m, refusal achieved.

Method, Plant, Stability, Dimensions
0.00 - 7.70m BH Competitor 130

Logger GW

Checked By: JS **Approved By:** RR

Created using Pebble Geo

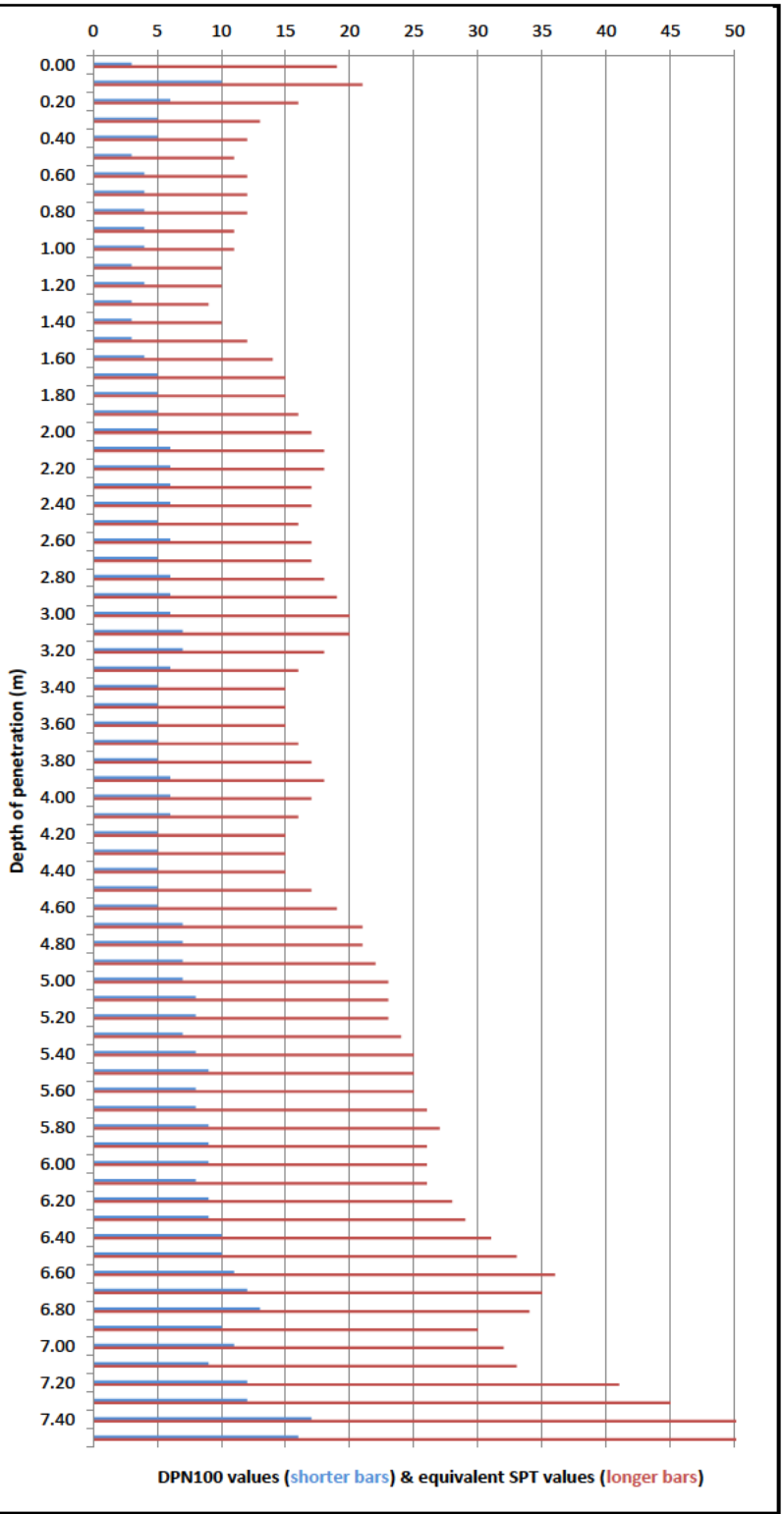
Dynamic Probe Test Results Sheet

Site:	**PICKHILL FARM**	DP No:	**DP1**
Job Number:	**SS-25-14187**	Date:	29-Aug-25
Client:	Sedgwick	Test Type:	DPSH
Rig Type:	Competitor 130	Final Depth:	7.90
		Sheet 1 of 2	

Penetration Test Results			
Depth (m)	DPN_{100}	DPN_{300}	SPT N *
0.00	3	19	19
0.10	10	21	21
0.20	6	16	16
0.30	5	13	13
0.40	5	12	12
0.50	3	11	11
0.60	4	12	12
0.70	4	12	12
0.80	4	12	12
0.90	4	11	11
1.00	4	11	11
1.10	3	10	10
1.20	4	10	10
1.30	3	9	9
1.40	3	10	10
1.50	3	12	12
1.60	4	14	14
1.70	5	15	15
1.80	5	15	15
1.90	5	16	16
2.00	5	17	17
2.10	6	18	18
2.20	6	18	18
2.30	6	17	17
2.40	6	17	17
2.50	5	16	16
2.60	6	17	17
2.70	5	17	17
2.80	6	18	18
2.90	6	19	19
3.00	6	20	20
3.10	7	20	20
3.20	7	18	18
3.30	6	16	16
3.40	5	15	15
3.50	5	15	15
3.60	5	15	15
3.70	5	16	16
3.80	5	17	17
3.90	6	18	18
4.00	6	17	17
4.10	6	16	16
4.20	5	15	15
4.30	5	15	15
4.40	5	15	15
4.50	5	17	17
4.60	5	19	19
4.70	7	21	21
4.80	7	21	21
4.90	7	22	22
5.00	7	23	23
5.10	8	23	23
5.20	8	23	23
5.30	7	24	24
5.40	8	25	25
5.50	9	25	25
5.60	8	25	25
5.70	8	26	26
5.80	9	27	27
5.90	9	26	26
6.00	9	26	26
6.10	8	26	26
6.20	9	28	28
6.30	9	29	29
6.40	10	31	31
6.50	10	33	33
6.60	11	36	36
6.70	12	35	35
6.80	13	34	34
6.90	10	30	30
7.00	11	32	32
7.10	9	33	33
7.20	12	41	41
7.30	12	45	45
7.40	17	51	51
7.50	16	52	52

Hammer Mass: 63.5kg Cone Dia: 50.5mm

Drop Height: 750mm Test by: GW



General Remarks:

DPN_{100} = Dynamic penetration resistance for 100mm penetration.

DPN_{300} = Dynamic penetration resistance for 300mm penetration (ie: sum of 3 consecutive DPN_{100} values), starting at the depth given.

* Equivalent SPT N-values (for 300mm penetration) assumed to approximate the DPN_{300} values for dynamic probe "super-heavy" test (DPSH).

For dynamic probe "heavy" test (DPH), equivalent SPT N-values estimated using the theoretical relationship DPN_{300} = 1.5 SPT-N. [see Card,G.B., Roche,D.P. & Herbert,S.M., in Geol. Soc. Special Publication No 6, *Field Testing in Engineering Geology* (1990)]. SPT values are estimated and are for general guidance only.

Pre augered to 1.00m

Dynamic Probe Test Results Sheet

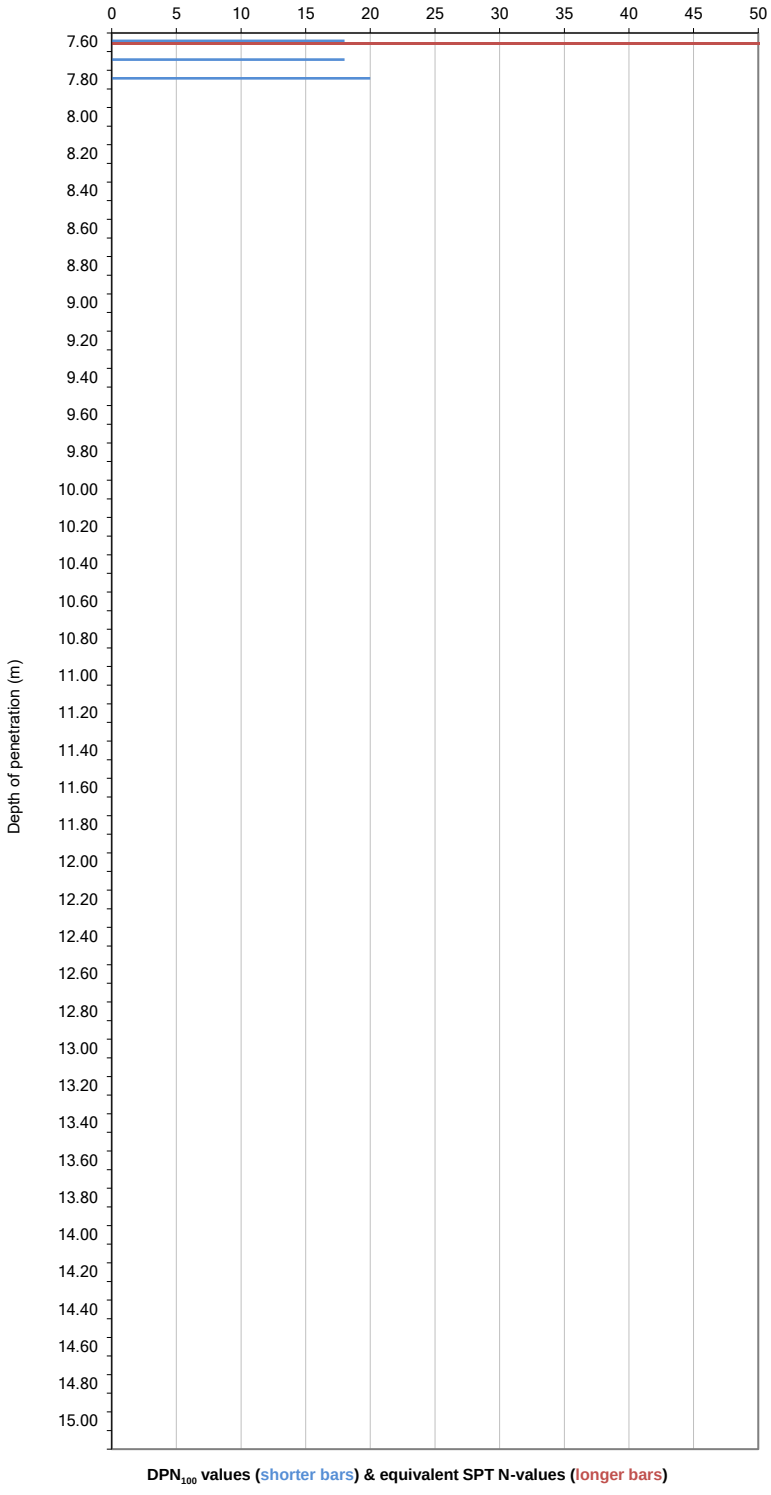
Site:	**PICKHILL FARM**	DP No:	**DP1**
Job Number:	**SS-25-14187**	Date:	29-Aug-25
Client:	Sedgwick	Test Type:	DPSH
Rig Type:	Competitor 130	Final Depth:	7.90
		Sheet 2 of 2	

Penetration Test Results

Depth (m)	DPN_{100}	DPN_{300}	SPT N *
7.60	18	56	56
7.70	18		
7.80	20		
7.90			
8.00			
8.10			
8.20			
8.30			
8.40			
8.50			
8.60			
8.70			
8.80			
8.90			
9.00			
9.10			
9.20			
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13.40			
13.50			
13.60			
13.70			
13.80			
13.90			
14.00			
14.10			
14.20			
14.30			
14.40			
14.50			
14.60			
14.70			
14.80			
14.90			
15.00			

Hammer Mass: 63.5kg Cone Dia: 50.5mm

Drop Height: 750mm Test by: GW



DPN_{100} values (shorter bars) & equivalent SPT N-values (longer bars)

General Remarks:

DPN_{100} = Dynamic penetration resistance for 100mm penetration.

DPN_{300} = Dynamic penetration resistance for 300mm penetration (ie: sum of 3 consecutive DPN_{100} values), starting at the depth given.

* Equivalent SPT N-values (for 300mm penetration) assumed to approximate the DPN_{300} values for dynamic probe "super-heavy" test (DPSH).

For dynamic probe "heavy" test (DPH), equivalent SPT N-values estimated using the theoretical relationship DPN_{300} = 1.5 SPT-N. [see Card,G.B., Roche,D.P. & Herbert,S.M., in Geol. Soc. Special Publication No 6, Field Testing in Engineering Geology (1990)]. SPT values are estimated and are for general guidance only.

Borehole Log

BH2

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
BH	339186.00	347798.00	32.32	1:50

Project Name	Project No.	Start Date	End Date
Pickhill Farm	SS-25-14187	2025-10-11	2025-10-11

Client Sedgwick

Consultant Rob Ray

Contractor Shire Structures

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Type/ Ref	Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Description
					32.12	(0.20) 0.20		MADE GROUND: Disturbed brown gravelly CLAY. Gravel is sandstone/limestone.
								Firm becoming very stiff reddish brown silty CLAY with rare gravel and grey grey veining.
		1.00	HV	N/A (kPa)				
		2.00	HV	150+ (kPa)		(4.80)		
		3.00	HV	150+ (kPa)				
		4.00	HV	150+ (kPa)				
		5.00	HV	150+ (kPa)	27.32	5.00		*End of Borehole at 5.00m*

Remarks
Borehole terminated at 5.0m, refusal achieved.

Method, Plant, Stability, Dimensions
0.00 - 5.00m BH Competitor 130

Logger
GW

Checked By: JS **Approved By:** RR

Created using Pebble Geo

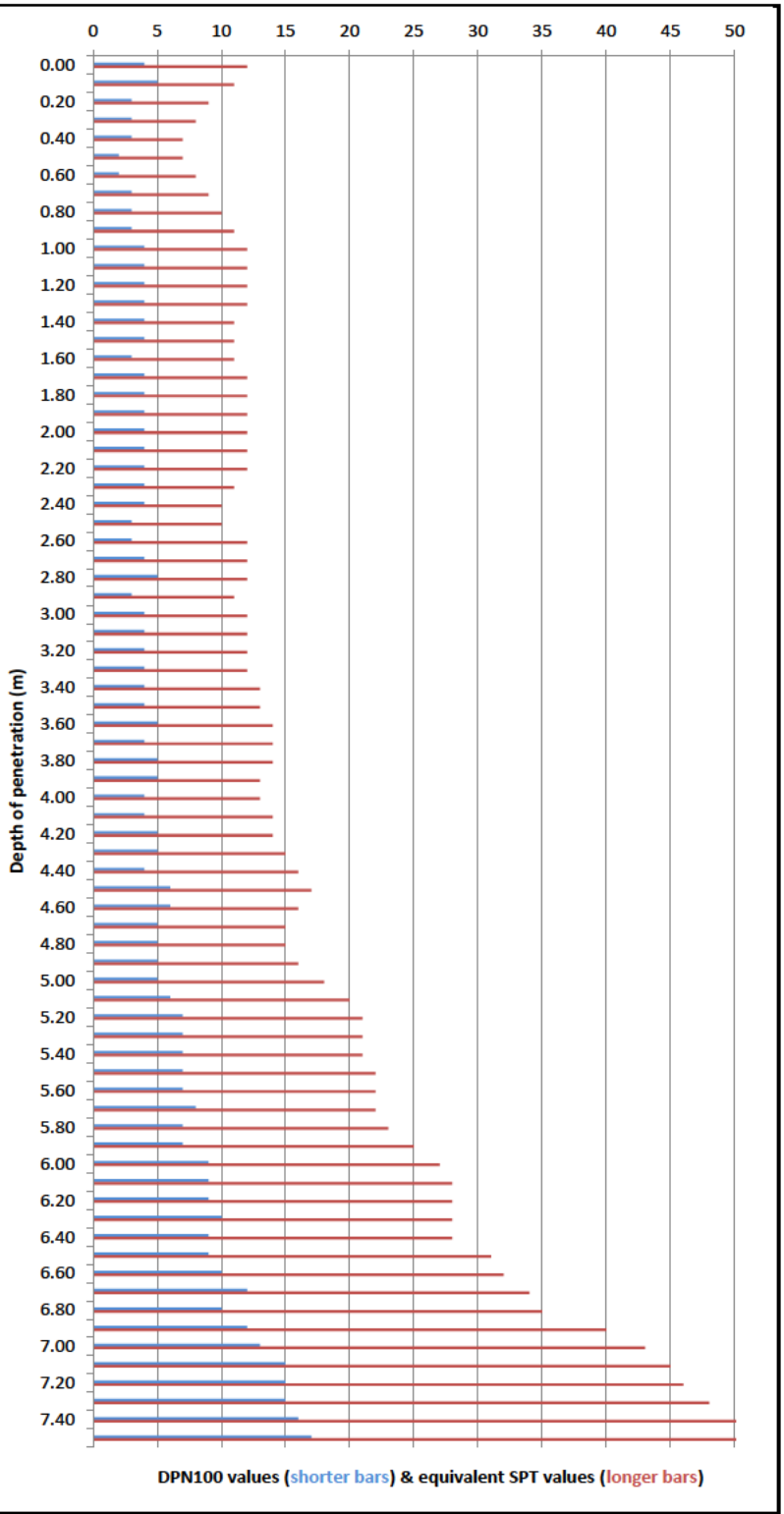
Dynamic Probe Test Results Sheet

Site:	**PICKHILL FARM**	DP No:	**DP2**
Job Number:	**SS-25-14187**	Date:	29-Aug-25
Client:	Sedgwick	Test Type:	DPSH
Rig Type:	Competitor 130	Final Depth:	7.80
		Sheet 1 of 2	

Penetration Test Results			
Depth (m)	DPN_{100}	DPN_{300}	SPT N *
0.00	4	12	12
0.10	5	11	11
0.20	3	9	9
0.30	3	8	8
0.40	3	7	7
0.50	2	7	7
0.60	2	8	8
0.70	3	9	9
0.80	3	10	10
0.90	3	11	11
1.00	4	12	12
1.10	4	12	12
1.20	4	12	12
1.30	4	12	12
1.40	4	11	11
1.50	4	11	11
1.60	3	11	11
1.70	4	12	12
1.80	4	12	12
1.90	4	12	12
2.00	4	12	12
2.10	4	12	12
2.20	4	12	12
2.30	4	11	11
2.40	4	10	10
2.50	3	10	10
2.60	3	12	12
2.70	4	12	12
2.80	5	12	12
2.90	3	11	11
3.00	4	12	12
3.10	4	12	12
3.20	4	12	12
3.30	4	12	12
3.40	4	13	13
3.50	4	13	13
3.60	5	14	14
3.70	4	14	14
3.80	5	14	14
3.90	5	13	13
4.00	4	13	13
4.10	4	14	14
4.20	5	14	14
4.30	5	15	15
4.40	4	16	16
4.50	6	17	17
4.60	6	16	16
4.70	5	15	15
4.80	5	15	15
4.90	5	16	16
5.00	5	18	18
5.10	6	20	20
5.20	7	21	21
5.30	7	21	21
5.40	7	21	21
5.50	7	22	22
5.60	7	22	22
5.70	8	22	22
5.80	7	23	23
5.90	7	25	25
6.00	9	27	27
6.10	9	28	28
6.20	9	28	28
6.30	10	28	28
6.40	9	28	28
6.50	9	31	31
6.60	10	32	32
6.70	12	34	34
6.80	10	35	35
6.90	12	40	40
7.00	13	43	43
7.10	15	45	45
7.20	15	46	46
7.30	15	48	48
7.40	16	51	51
7.50	17	58	58

Hammer Mass: 63.5kg Cone Dia: 50.5mm

Drop Height: 750mm Test by: GW



General Remarks:

DPN_{100} = Dynamic penetration resistance for 100mm penetration.

DPN_{300} = Dynamic penetration resistance for 300mm penetration (ie: sum of 3 consecutive DPN_{100} values), starting at the depth given.

* Equivalent SPT N-values (for 300mm penetration) assumed to approximate the DPN_{300} values for dynamic probe "super-heavy" test (DPSH).

For dynamic probe "heavy" test (DPH), equivalent SPT N-values estimated using the theoretical relationship DPN_{300} = 1.5 SPT-N. [see Card,G.B., Roche,D.P. & Herbert,S.M., in Geol. Soc. Special Publication No 6, *Field Testing in Engineering Geology* (1990)]. SPT values are estimated and are for general guidance only.

Pre augered to 1.00m

Dynamic Probe Test Results Sheet

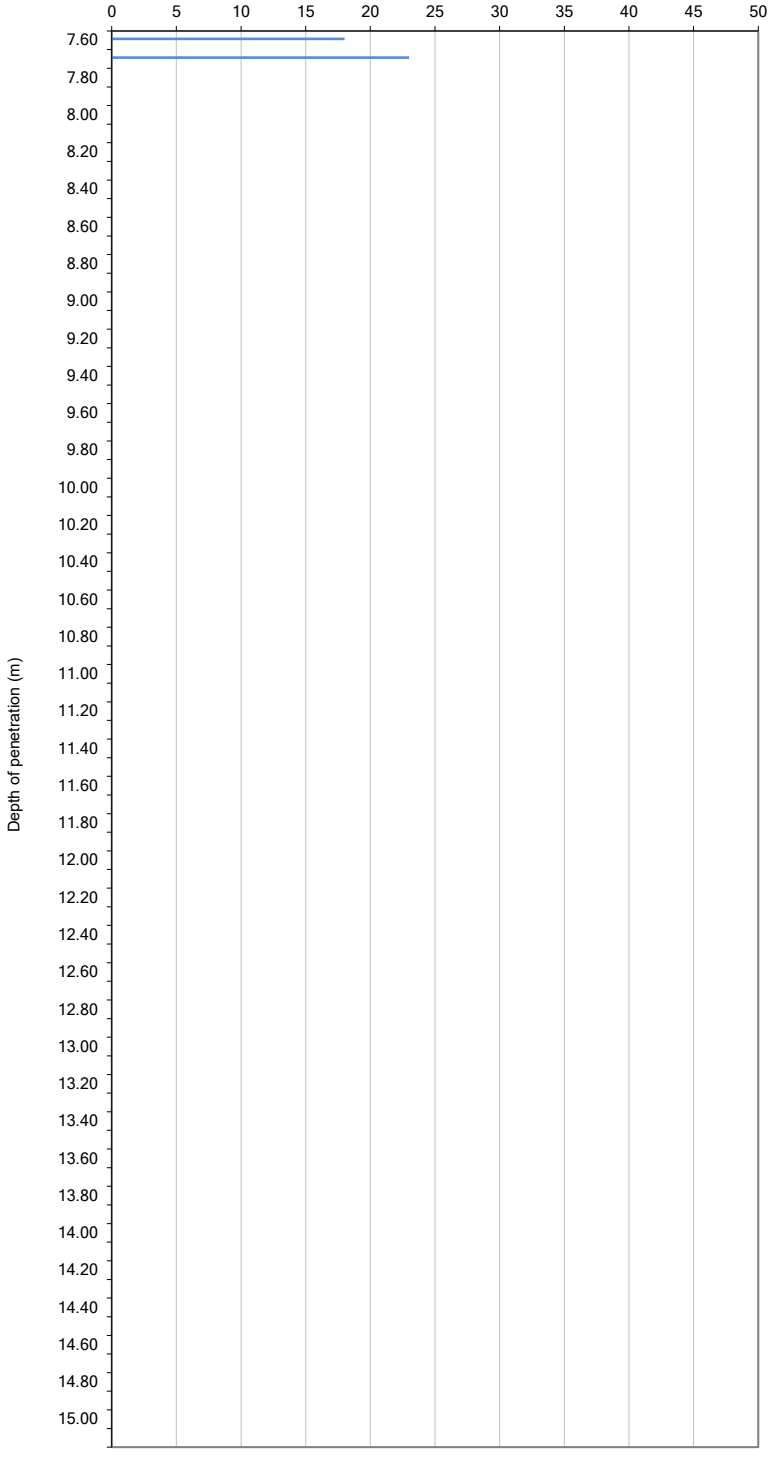
Site:	**PICKHILL FARM**	DP No:	**DP2**
Job Number:	**SS-25-14187**	Date:	29-Aug-25
Client:	Sedgwick	Test Type:	DPSH
Rig Type:	Competitor 130	Final Depth:	7.80
		Sheet 2 of 2	

Penetration Test Results

Depth (m)	DPN_{100}	DPN_{300}	SPT N *
7.60	18		
7.70	23		
7.80			
7.90			
8.00			
8.10			
8.20			
8.30			
8.40			
8.50			
8.60			
8.70			
8.80			
8.90			
9.00			
9.10			
9.20			
9.30			
9.40			
9.50			
9.60			
9.70			
9.80			
9.90			
10.00			
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10.50			
10.60			
10.70			
10.80			
10.90			
11.00			
11.10			
11.20			
11.30			
11.40			
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13.60			
13.70			
13.80			
13.90			
14.00			
14.10			
14.20			
14.30			
14.40			
14.50			
14.60			
14.70			
14.80			
14.90			
15.00			

Hammer Mass: 63.5kg Cone Dia: 50.5mm

Drop Height: 750mm Test by: GW



DPN_{100} values (shorter bars) & equivalent SPT N-values (longer bars)

General Remarks:

DPN_{100} = Dynamic penetration resistance for 100mm penetration.

DPN_{300} = Dynamic penetration resistance for 300mm penetration (ie: sum of 3 consecutive DPN_{100} values), starting at the depth given.

* Equivalent SPT N-values (for 300mm penetration) assumed to approximate the DPN_{300} values for dynamic probe "super-heavy" test (DPSH).

For dynamic probe "heavy" test (DPH), equivalent SPT N-values estimated using the theoretical relationship DPN_{300} = 1.5 SPT-N. [see Card,G.B., Roche,D.P. & Herbert,S.M., in Geol. Soc. Special Publication No 6, Field Testing in Engineering Geology (1990)]. SPT values are estimated and are for general guidance only.

Borehole Log

BH3

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
BH	339169.00	347796.00	32.73	1:50

Project Name	Project No.	Start Date	End Date
Pickhill Farm	SS-25-14187	2025-10-11	2025-10-11

Client Sedgwick

Consultant Rob Ray

Contractor Shire Structures

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Type/ Ref	Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Description
								Soft becoming very stiff reddish brown silty CLAY with rare fine sub-rounded gravel, grey veining and decayed roots.
		1.00	HV	150+ (kPa)				
		2.00	HV	150+ (kPa)		(4.50)		
		3.00	HV	150+ (kPa)				
		4.00	HV	150+ (kPa)				
		4.50	HV	150+ (kPa)	28.23	4.50		*End of Borehole at 4.50m*

Remarks
Borehole terminated at 4.5m, refusal achieved.

Method, Plant, Stability, Dimensions
0.00 - 4.50m BH Competitor 130

Logger GW

Checked By: JS **Approved By:** RR

Created using Pebble Geo

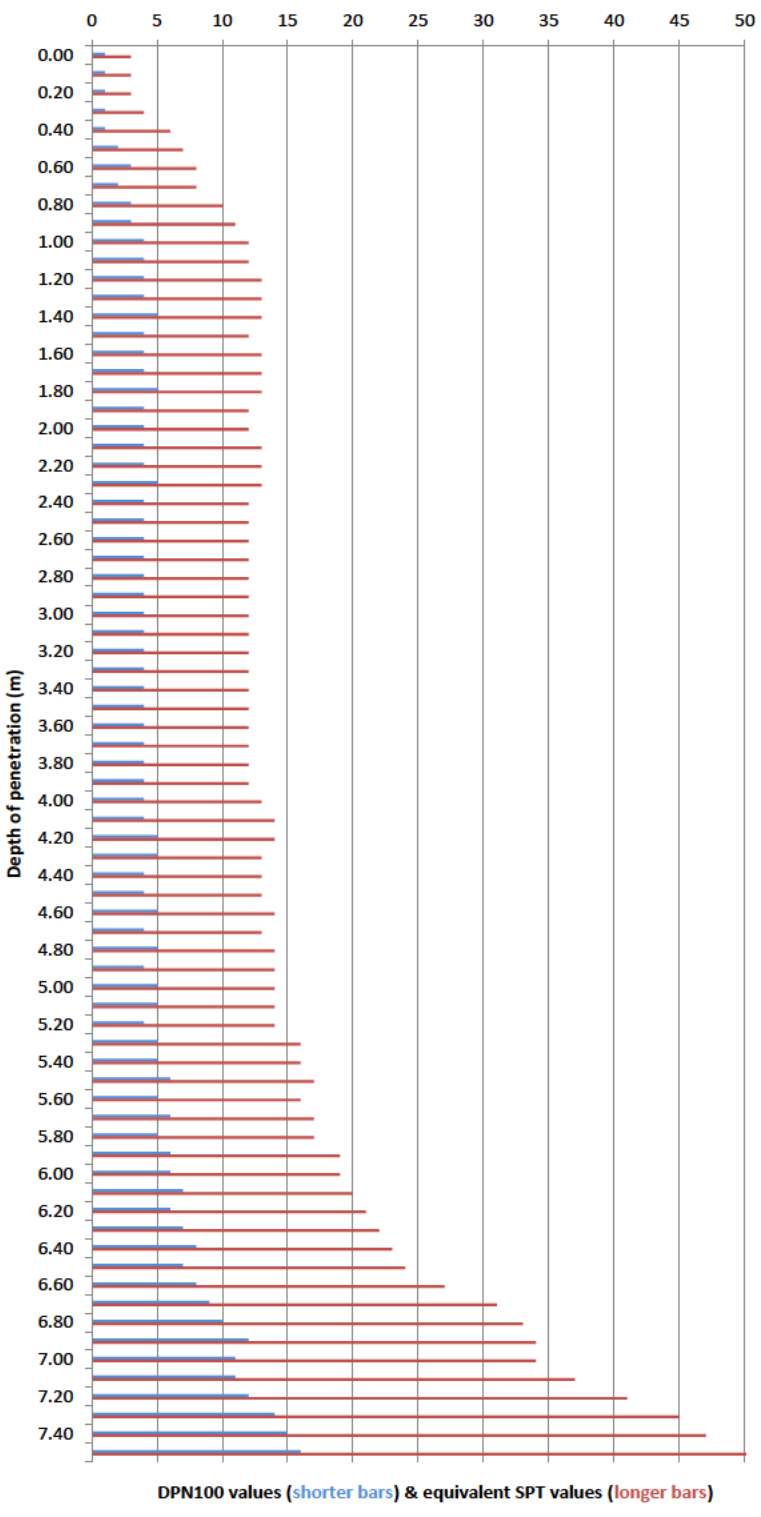
Dynamic Probe Test Results Sheet

Site:	**PICKHILL FARM**	DP No:	**DP3**
Job Number:	**SS-25-14187**	Date:	29-Aug-25
Client:	Sedgwick	Test Type:	DPSH
Rig Type:	Competitor 130	Final Depth:	8.00
		Sheet 1 of 2	

Penetration Test Results			
Depth (m)	DPN_{100}	DPN_{300}	SPT N *
0.00	1	3	3
0.10	1	3	3
0.20	1	3	3
0.30	1	4	4
0.40	1	6	6
0.50	2	7	7
0.60	3	8	8
0.70	2	8	8
0.80	3	10	10
0.90	3	11	11
1.00	4	12	12
1.10	4	12	12
1.20	4	13	13
1.30	4	13	13
1.40	5	13	13
1.50	4	12	12
1.60	4	13	13
1.70	4	13	13
1.80	5	13	13
1.90	4	12	12
2.00	4	12	12
2.10	4	13	13
2.20	4	13	13
2.30	5	13	13
2.40	4	12	12
2.50	4	12	12
2.60	4	12	12
2.70	4	12	12
2.80	4	12	12
2.90	4	12	12
3.00	4	12	12
3.10	4	12	12
3.20	4	12	12
3.30	4	12	12
3.40	4	12	12
3.50	4	12	12
3.60	4	12	12
3.70	4	12	12
3.80	4	12	12
3.90	4	12	12
4.00	4	13	13
4.10	4	14	14
4.20	5	14	14
4.30	5	13	13
4.40	4	13	13
4.50	4	13	13
4.60	5	14	14
4.70	4	13	13
4.80	5	14	14
4.90	4	14	14
5.00	5	14	14
5.10	5	14	14
5.20	4	14	14
5.30	5	16	16
5.40	5	16	16
5.50	6	17	17
5.60	5	16	16
5.70	6	17	17
5.80	5	17	17
5.90	6	19	19
6.00	6	19	19
6.10	7	20	20
6.20	6	21	21
6.30	7	22	22
6.40	8	23	23
6.50	7	24	24
6.60	8	27	27
6.70	9	31	31
6.80	10	33	33
6.90	12	34	34
7.00	11	34	34
7.10	11	37	37
7.20	12	41	41
7.30	14	45	45
7.40	15	47	47
7.50	16	51	51

Hammer Mass: 63.5kg Cone Dia: 50.5mm

Drop Height: 750mm Test by: GW



General Remarks:

DPN_{100} = Dynamic penetration resistance for 100mm penetration.

DPN_{300} = Dynamic penetration resistance for 300mm penetration (ie: sum of 3 consecutive DPN_{100} values), starting at the depth given.

* Equivalent SPT N-values (for 300mm penetration) assumed to approximate the DPN_{300} values for dynamic probe "super-heavy" test (DPSH).

For dynamic probe "heavy" test (DPH), equivalent SPT N-values estimated using the theoretical relationship DPN_{300} = 1.5 SPT-N. [see Card,G.B., Roche,D.P. & Herbert,S.M., in Geol. Soc. Special Publication No 6, *Field Testing in Engineering Geology* (1990)]. SPT values are estimated and are for general guidance only.

Pre augered to 1.00m

Dynamic Probe Test Results Sheet

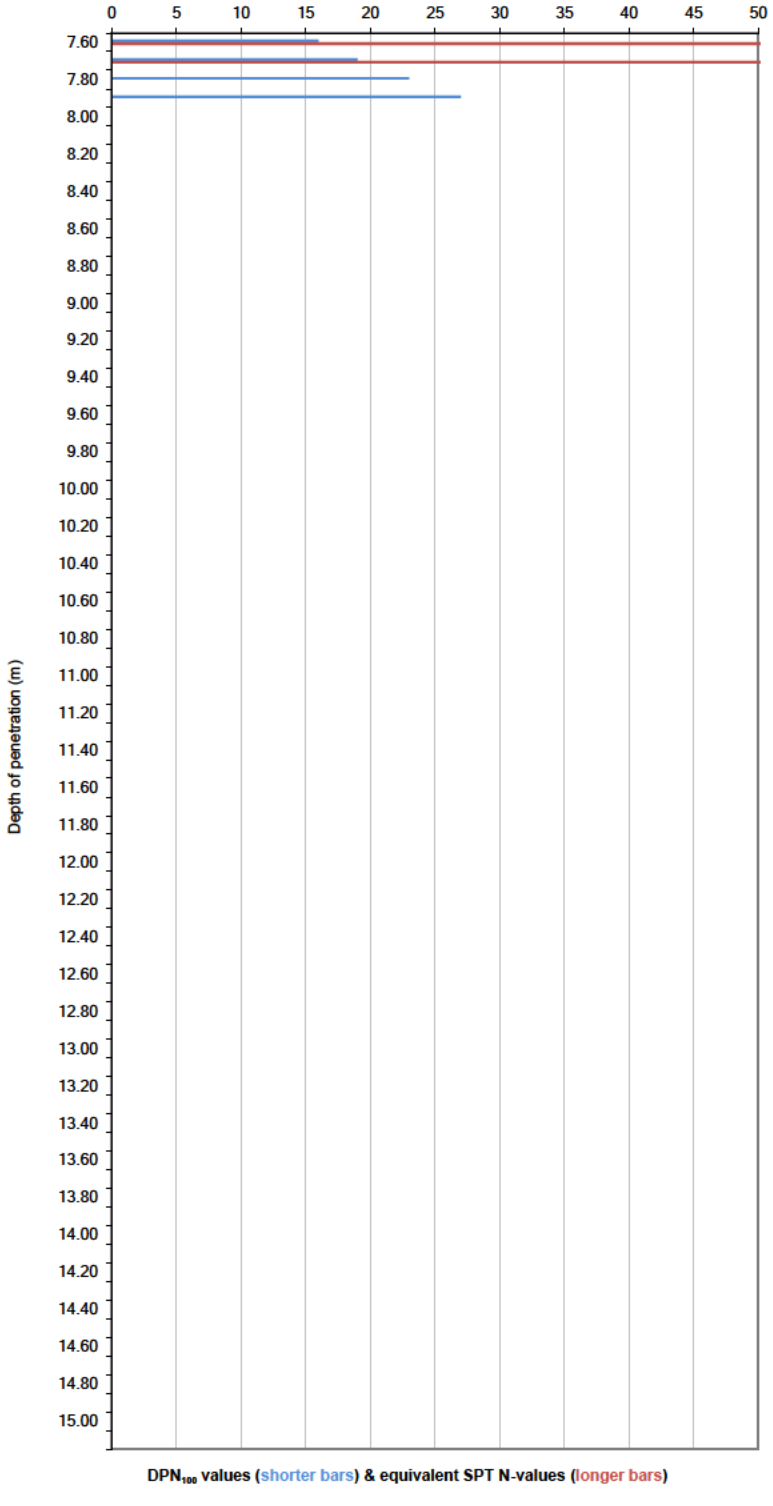
Site:	**PICKHILL FARM**	DP No:	**DP3**
Job Number:	**SS-25-14187**	Date:	29-Aug-25
Client:	Sedgwick	Test Type:	DPSH
Rig Type:	Competitor 130	Final Depth:	8.00
		Sheet 2 of 2	

Penetration Test Results

Depth (m)	DPN_{100}	DPN_{300}	SPT N *
7.60	16	58	58
7.70	19	69	69
7.80	23		
7.90	27		
8.00			
8.10			
8.20			
8.30			
8.40			
8.50			
8.60			
8.70			
8.80			
8.90			
9.00			
9.10			
9.20			
9.30			
9.40			
9.50			
9.60			
9.70			
9.80			
9.90			
10.00			
10.10			
10.20			
10.30			
10.40			
10.50			
10.60			
10.70			
10.80			
10.90			
11.00			
11.10			
11.20			
11.30			
11.40			
11.50			
11.60			
11.70			
11.80			
11.90			
12.00			
12.10			
12.20			
12.30			
12.40			
12.50			
12.60			
12.70			
12.80			
12.90			
13.00			
13.10			
13.20			
13.30			
13.40			
13.50			
13.60			
13.70			
13.80			
13.90			
14.00			
14.10			
14.20			
14.30			
14.40			
14.50			
14.60			
14.70			
14.80			
14.90			
15.00			

Hammer Mass: 63.5kg Cone Dia: 50.5mm

Drop Height: 750mm Test by: GW



DPN_{100} values (shorter bars) & equivalent SPT N-values (longer bars)

General Remarks:

DPN_{100} = Dynamic penetration resistance for 100mm penetration.

DPN_{300} = Dynamic penetration resistance for 300mm penetration (ie: sum of 3 consecutive DPN_{100} values), starting at the depth given.

* Equivalent SPT N-values (for 300mm penetration) assumed to approximate the DPN_{300} values for dynamic probe "super-heavy" test (DPSH).

For dynamic probe "heavy" test (DPH), equivalent SPT N-values estimated using the theoretical relationship DPN_{300} = 1.5 SPT-N. [see Card,G.B., Roche,D.P. & Herbert,S.M., in Geol. Soc. Special Publication No 6, Field Testing in Engineering Geology (1990)]. SPT values are estimated and are for general guidance only.

Borehole Log

BH4

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
BH	339182.00	347789.00	32.03	1:50

Project Name	Project No.	Start Date	End Date
Pickhill Farm	SS-25-14187	2025-10-11	2025-10-11

Client Sedgwick

Consultant Rob Ray

Contractor Shire Structures

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Type/ Ref	Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Description
		1.00	HV	150+ (kPa)				Firm becoming very stiff reddish brown silty CLAY with rare fine sub-rounded gravel, grey veining and decayed roots.
		2.00	HV	150+ (kPa)		(5.00)		
		3.00	HV	150+ (kPa)				
		4.00	HV	150+ (kPa)				
		5.00	HV	150+ (kPa)	27.03	5.00		*End of Borehole at 5.00m*

Remarks
Borehole terminated at 5.0m, refusal achieved.

Method, Plant, Stability, Dimensions
0.00 - 5.00m BH Competitor 130

Logger GW

Checked By: JS **Approved By:** RR

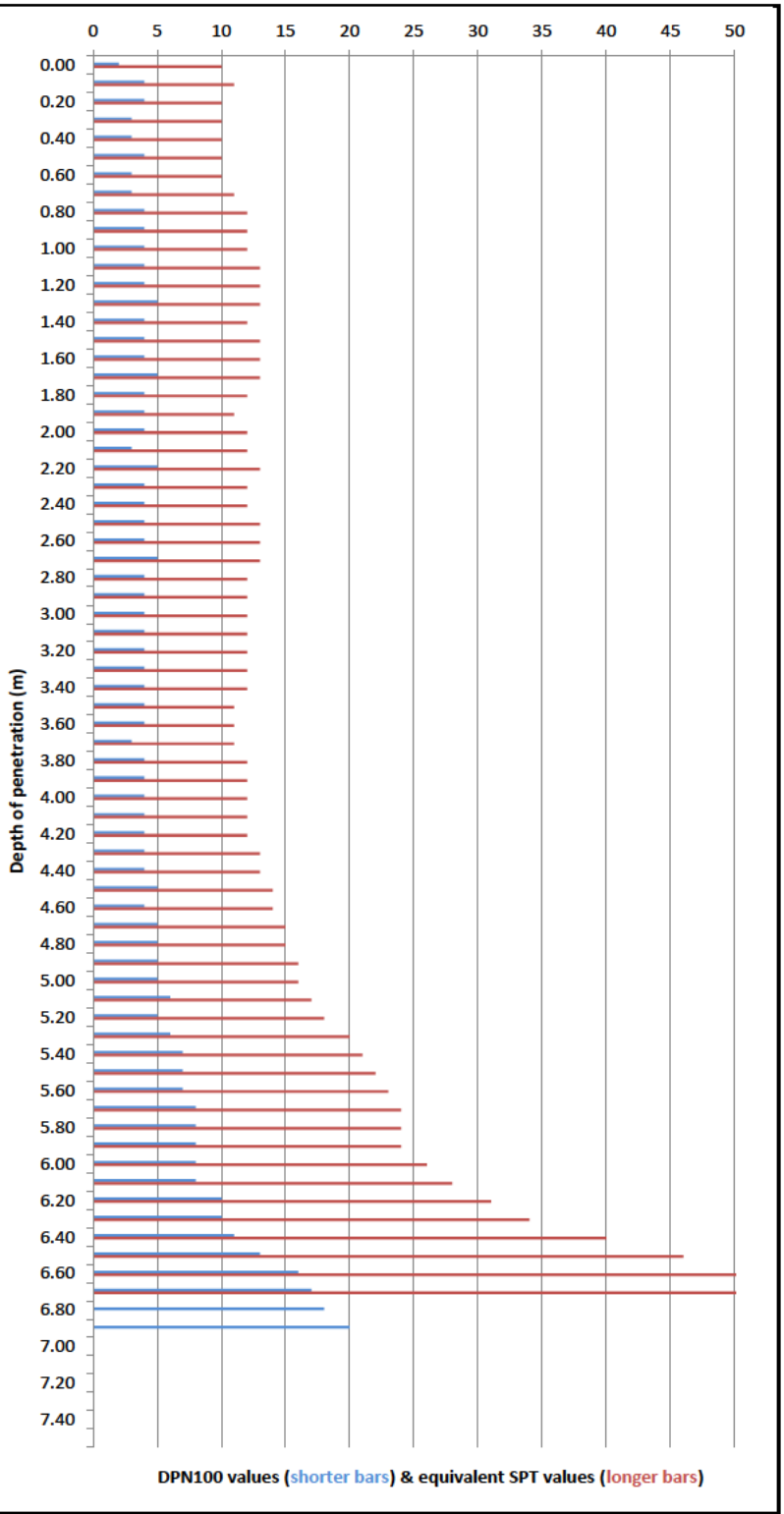
Dynamic Probe Test Results Sheet

Site:	**PICKHILL FARM**	DP No:	**DP4**
Job Number:	**SS-25-14187**	Date:	29-Aug-25
Client:	Sedgwick	Test Type:	DPSH
Rig Type:	Competitor 130	Final Depth:	7.00
		Sheet 1 of 1	

Penetration Test Results			
Depth (m)	DPN_{100}	DPN_{300}	SPT N *
0.00	2	10	10
0.10	4	11	11
0.20	4	10	10
0.30	3	10	10
0.40	3	10	10
0.50	4	10	10
0.60	3	10	10
0.70	3	11	11
0.80	4	12	12
0.90	4	12	12
1.00	4	12	12
1.10	4	13	13
1.20	4	13	13
1.30	5	13	13
1.40	4	12	12
1.50	4	13	13
1.60	4	13	13
1.70	5	13	13
1.80	4	12	12
1.90	4	11	11
2.00	4	12	12
2.10	3	12	12
2.20	5	13	13
2.30	4	12	12
2.40	4	12	12
2.50	4	13	13
2.60	4	13	13
2.70	5	13	13
2.80	4	12	12
2.90	4	12	12
3.00	4	12	12
3.10	4	12	12
3.20	4	12	12
3.30	4	12	12
3.40	4	12	12
3.50	4	11	11
3.60	4	11	11
3.70	3	11	11
3.80	4	12	12
3.90	4	12	12
4.00	4	12	12
4.10	4	12	12
4.20	4	12	12
4.30	4	13	13
4.40	4	13	13
4.50	5	14	14
4.60	4	14	14
4.70	5	15	15
4.80	5	15	15
4.90	5	16	16
5.00	5	16	16
5.10	6	17	17
5.20	5	18	18
5.30	6	20	20
5.40	7	21	21
5.50	7	22	22
5.60	7	23	23
5.70	8	24	24
5.80	8	24	24
5.90	8	24	24
6.00	8	26	26
6.10	8	28	28
6.20	10	31	31
6.30	10	34	34
6.40	11	40	40
6.50	13	46	46
6.60	16	51	51
6.70	17	55	55
6.80	18		
6.90	20		
7.00			
7.10			
7.20			
7.30			
7.40			
7.50			

Hammer Mass: 63.5kg Cone Dia: 50.5mm

Drop Height: 750mm Test by: GW



General Remarks:

DPN_{100} = Dynamic penetration resistance for 100mm penetration.

DPN_{300} = Dynamic penetration resistance for 300mm penetration (ie: sum of 3 consecutive DPN_{100} values), starting at the depth given.

* Equivalent SPT N-values (for 300mm penetration) assumed to approximate the DPN_{300} values for dynamic probe "super-heavy" test (DPSH).

For dynamic probe "heavy" test (DPH), equivalent SPT N-values estimated using the theoretical relationship DPN_{300} = 1.5 SPT-N. [see Card,G.B., Roche,D.P. & Herbert,S.M., in Geol. Soc. Special Publication No 6, *Field Testing in Engineering Geology* (1990)]. SPT values are estimated and are for general guidance only.

Pre augered to 1.00m

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022, cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,cl 5.2 and 6

4041

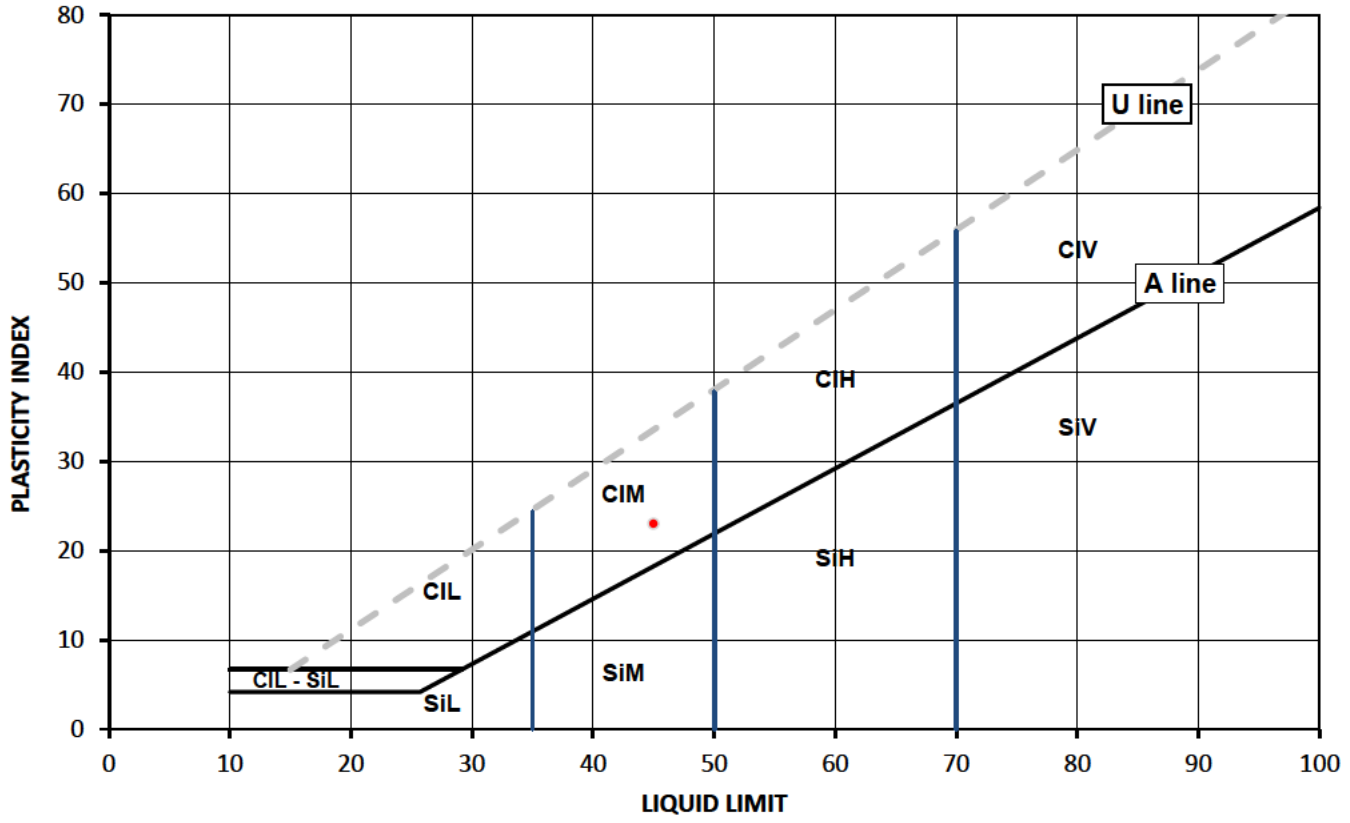
Client:	Shire Structures	Client Reference:	SS-25-14187
Client Address:	The Chapel, Barnsley Hall Road, Bromsgrove, B61 0SZ	Job Number:	25-050335-1
		Date Sampled:	29/08/2025
		Date Received:	19/09/2025
Contact:	Jack Stokes	Date Tested:	26/09/2025
Site Address:	Pickhill Farm	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	686120	Depth Top [m]:	1.00
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly sandy CLAY		
Sample Preparation:	Tested in natural condition; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
18.5	45	22	23	-0.13	1.13	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 10/10/2025

GF 337.16

i2 Analytical Ltd, Unit 8, Harrowden Road, Brackmills Industrial Estate, Northampton, NN4 7EB

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022, cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,cl 5.2 and 6

4041

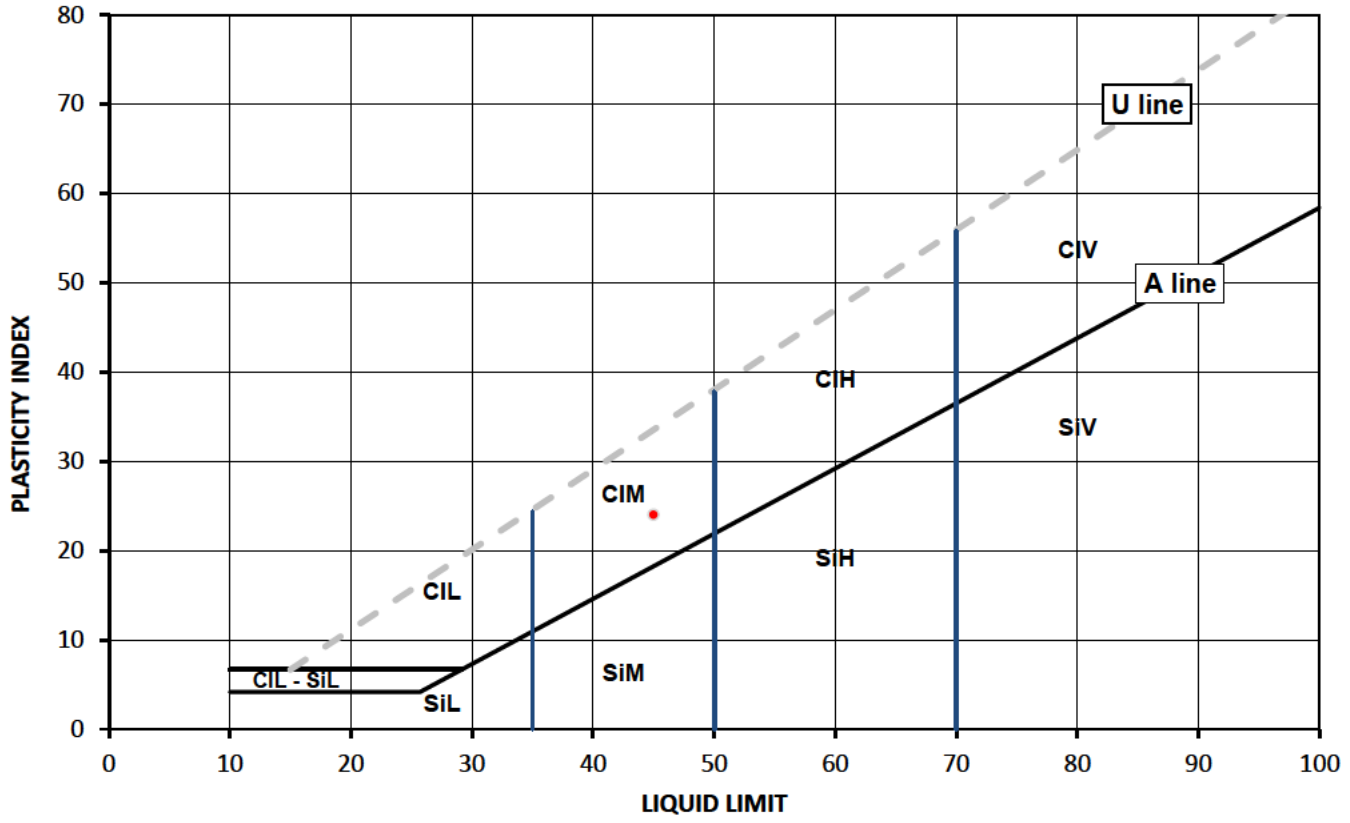
Client:	Shire Structures	Client Reference:	SS-25-14187
Client Address:	The Chapel, Barnsley Hall Road, Bromsgrove, B61 0SZ	Job Number:	25-050335-1
		Date Sampled:	29/08/2025
		Date Received:	19/09/2025
Contact:	Jack Stokes	Date Tested:	26/09/2025
Site Address:	Pickhill Farm	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	686124	Depth Top [m]:	3.00
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly slightly sandy CLAY		
Sample Preparation:	Tested after >0.425mm removed by hand; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
19.3	45	21	24	-0.08	1.08	99



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

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Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 10/10/2025

GF 337.16

i2 Analytical Ltd, Unit 8, Harrowden Road, Brackmills Industrial Estate, Northampton, NN4 7EB

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022, cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,cl 5.2 and 6

4041

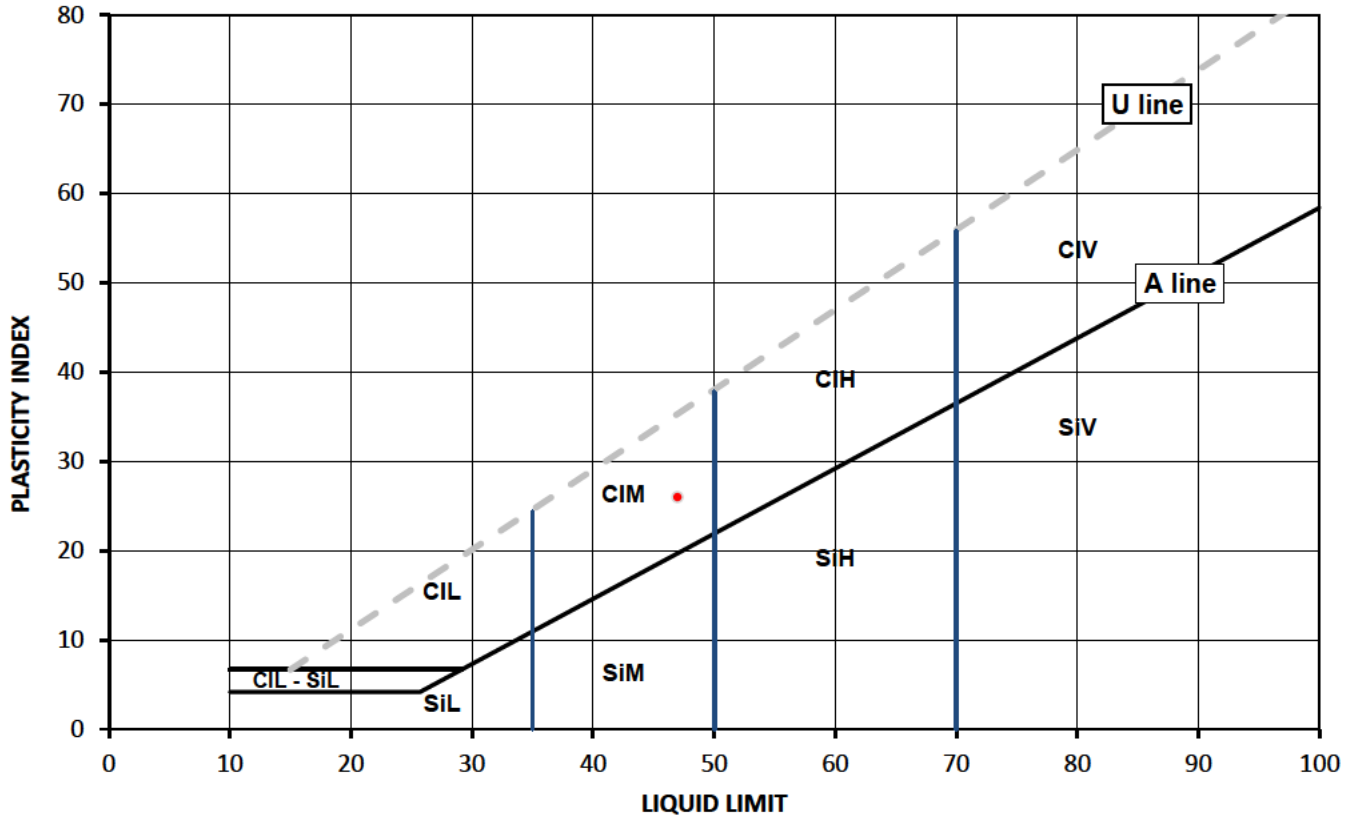
Client:	Shire Structures	Client Reference:	SS-25-14187
Client Address:	The Chapel, Barnsley Hall Road, Bromsgrove, B61 0SZ	Job Number:	25-050335-1
		Date Sampled:	29/08/2025
		Date Received:	19/09/2025
Contact:	Jack Stokes	Date Tested:	26/09/2025
Site Address:	Pickhill Farm	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	686128	Depth Top [m]:	5.00
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brownish grey slightly sandy CLAY		
Sample Preparation:	Tested in natural condition; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
16.8	47	21	26	-0.15	1.15	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

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Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 10/10/2025

GF 337.16

i2 Analytical Ltd, Unit 8, Harrowden Road, Brackmills Industrial Estate, Northampton, NN4 7EB

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

BS EN ISO 17892-12:2018+A2:2022 cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022, cl 5.2 and 6. W by BS EN ISO 17892-1:2014+A1:2022.

Normec i2 Analytical

4041

Client: Shire Structures

Client Address: The Chapel, Barnsley Hall Road, Bromsgrove, B61 0SZ

Contact: Jack Stokes

Site Address: Pickhill Farm

Client Reference: SS-25-14187
Job Number: 25-050335-1
Date Sampled: 29/08/2025
Date Received: 19/09/2025
Date Tested: 26/09/2025
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	W	Liquid & Plastic Limit							Density		
		Reference	Depth Top m	Depth Base m	Type			%	% Passing 425um %	WL* %	Correlation Factor	Wp %	Ip %	Cone type	Sample Preparation	bulk Mg/m3	dry Mg/m3	PD Mg/m3
686120	BH1	Not Given	1.00	Not Given	D	Brown slightly sandy CLAY	Atterberg 4 Point	18.5	100	45	-	22	23	80g/30 deg	N / I			
686121	BH1	Not Given	1.50	Not Given	D	Brown slightly sandy CLAY		19.9										
686122	BH1	Not Given	2.00	Not Given	D	Brownish grey CLAY		20.4										
686123	BH1	Not Given	2.50	Not Given	D	Brown CLAY		17.6										
686124	BH1	Not Given	3.00	Not Given	D	Brown slightly gravelly slightly sandy CLAY	Atterberg 4 Point	19.3	99	45	-	21	24	80g/30 deg	R / I			
686125	BH1	Not Given	3.50	Not Given	D	Brown CLAY		20.6										
686126	BH1	Not Given	4.00	Not Given	D	Brown CLAY		19.6										
686127	BH1	Not Given	4.50	Not Given	D	Brown CLAY		19.2										
686128	BH1	Not Given	5.00	Not Given	D	Brownish grey slightly sandy CLAY	Atterberg 4 Point	16.8	100	47	-	21	26	80g/30 deg	N / I			
686129	BH1	Not Given	5.50	Not Given	D	Brown CLAY		20.2										

Note: # Non accredited; NP - Non plastic; N - Tested in natural condition, R - Tested after >0,425mm removed by hand, WR - Tested after washing to remove >425mm; I - The water content in the sample was increased , D - The water content in the sample was decreased; * - One point liquid limit corrected as per the report Correlation Factor by Clayton C.R.I and Jukes A.W (1978)

Comments:

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[redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 10/10/2025 **GF 362.17**

i2 Analytical Ltd, Unit 8, Harrowden Road, Brackmills Industrial Estate, Northampton, NN4 7EB

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

W by BS EN ISO 17892-1:2014+A1:2022.

4041

Client: Shire Structures

Client Address: The Chapel, Barnsley Hall Road, Bromsgrove, B61 0SZ

Contact: Jack Stokes

Site Address: Pickhill Farm

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: SS-25-14187
Job Number: 25-050335-1
Date Sampled: 29/08/2025
Date Received: 19/09/2025
Date Tested: 26/09/2025
Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	W	Liquid & Plastic Limit							Density		
		Reference	Depth Top m	Depth Base m	Type			%	% Passing 425um %	WL* %	Correlation Factor	Wp %	Ip %	Cone type	Sample Preparation	bulk Mg/m3	dry Mg/m3	PD Mg/m3
686130	BH1	Not Given	6.00	Not Given	D	Brown slightly gravelly slightly sandy CLAY		20.7										

Note: # Non accredited; NP - Non plastic; N - Tested in natural condition, R - Tested after >0,425mm removed by hand, WR - Tested after washing to remove >425mm; I - The water content in the sample was increased , D - The water content in the sample was decreased; * - One point liquid limit corrected as per the report Correlation Factor by Clayton C.R.I and Jukes A.W (1978)

Comments:

Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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Date Reported: 10/10/2025 **GF 362.17**

SUMMARY REPORT

DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS EN ISO 17892-1:2014+A1:2022, BS 1377-2: 2022, clause 4.1

4041

Client: Shire Structures

Client Address: The Chapel, Barnsley Hall Road,
Bromsgrove, B61 0SZ

Contact: Jack Stokes

Site Address: Pickhill Farm

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: SS-25-14187
Job Number: 25-050335-1
Date Sampled: 29/08/2025
Date Received: 19/09/2025
Date Tested: 26/09/2025
Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC											
		Reference	Depth Top m	Depth Base m	Type			%											
686120	BH1	Not Given	1.00	Not Given	D	Brown slightly sandy CLAY		18.5											
686121	BH1	Not Given	1.50	Not Given	D	Brown slightly sandy CLAY		19.9											
686122	BH1	Not Given	2.00	Not Given	D	Brownish grey CLAY		20.4											
686123	BH1	Not Given	2.50	Not Given	D	Brown CLAY		17.6											
686124	BH1	Not Given	3.00	Not Given	D	Brown slightly gravelly slightly sandy CLAY		19.3											
686125	BH1	Not Given	3.50	Not Given	D	Brown CLAY		20.6											
686126	BH1	Not Given	4.00	Not Given	D	Brown CLAY		19.6											
686127	BH1	Not Given	4.50	Not Given	D	Brown CLAY		19.2											
686128	BH1	Not Given	5.00	Not Given	D	Brownish grey slightly sandy CLAY		16.8											
686129	BH1	Not Given	5.50	Not Given	D	Brown CLAY		20.2											

Comments:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 10/10/2025

GF 126.20

SUMMARY REPORT

DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS EN ISO 17892-1:2014+A1:2022, BS 1377-2: 2022, clause 4.1

4041

Client: Shire Structures

Client Address: The Chapel, Barnsley Hall Road,
Bromsgrove, B61 0SZ

Contact: Jack Stokes

Site Address: Pickhill Farm

Client Reference: SS-25-14187
Job Number: 25-050335-1
Date Sampled: 29/08/2025
Date Received: 19/09/2025
Date Tested: 26/09/2025
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC											
		Reference	Depth Top m	Depth Base m	Type			%											
686130	BH1	Not Given	6.00	Not Given	D	Brown slightly gravelly slightly sandy CLAY		20.7											

Comments:

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Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 10/10/2025

GF 126.20

i2 Analytical Ltd, Unit 8, Harrowden Road, Brackmills Industrial Estate, Northampton, NN4 7EB

SUMMARY REPORT

DETERMINATION OF MATRIX SUCTION - FILTER PAPER METHOD

Tested in Accordance with: BRE Information Paper IP4/93

Normec i2 Analytical

Client: Shire Structures
Client Address: The Chapel, Barnsley Hall Road, Bromsgrove, B61 0SZ
Contact: Jack Stokes
Site Address: Pickhill Farm

Client Reference: SS-25-14187
Job Number: 25-050335-1
Date Sampled: 29/08/2025
Date Received: 19/09/2025
Date Tested: 01/10/2025
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Sample				Filter Paper			Avg. Soil Matrix Suction
		Reference	Depth Top m	Depth Base m	Type			U or R	Bulk density Mg/m3	WC %	Time under seal days	Reference	Water Content %	Matrix Suction kPa	kPa
686121	BH1	Not Given	1.50	Not Given	D	Brown slightly sandy CLAY		U	1.94	19.0	6	TOP MIDDLE BASE	35.47 / 34.75 / 35.77	430 / 477 / 412	440
686125	BH1	Not Given	3.50	Not Given	D	Brown CLAY		U	2.51	19.6	6	TOP MIDDLE BASE	29.40 / 27.16 / 27.90	1030 / 1410 / 1270	1240
686126	BH1	Not Given	4.00	Not Given	D	Brown CLAY		U	1.96	21.4	6	TOP MIDDLE BASE	32.46 / 32.19 / 32.46	662 / 688 / 662	671
686128	BH1	Not Given	5.00	Not Given	D	Brownish grey slightly sandy CLAY		U	1.90	22.1	6	TOP MIDDLE BASE	41.94 / 40.75 / 41.76	170 / 202 / 175	182
686129	BH1	Not Given	5.50	Not Given	D	Brown CLAY		U	2.03	20.9	6	TOP MIDDLE BASE	33.12 / 31.02 / 30.09	602 / 814 / 930	782
686130	BH1	Not Given	6.00	Not Given	D	Brown slightly gravelly slightly sandy CLAY		U	2.03	20.6	6	TOP MIDDLE BASE	41.14 / 41.59 / 40.27	191 / 179 / 216	196

Note: U - test from undisturbed sample, R - test on recompacted/remoulded sample; WC - Water Content (BS 1377-2:1990 clause 3.2)

Comments:

Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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Date Reported: 10/10/2025

GF 183.10

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022, cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,cl 5.2 and 6

4041

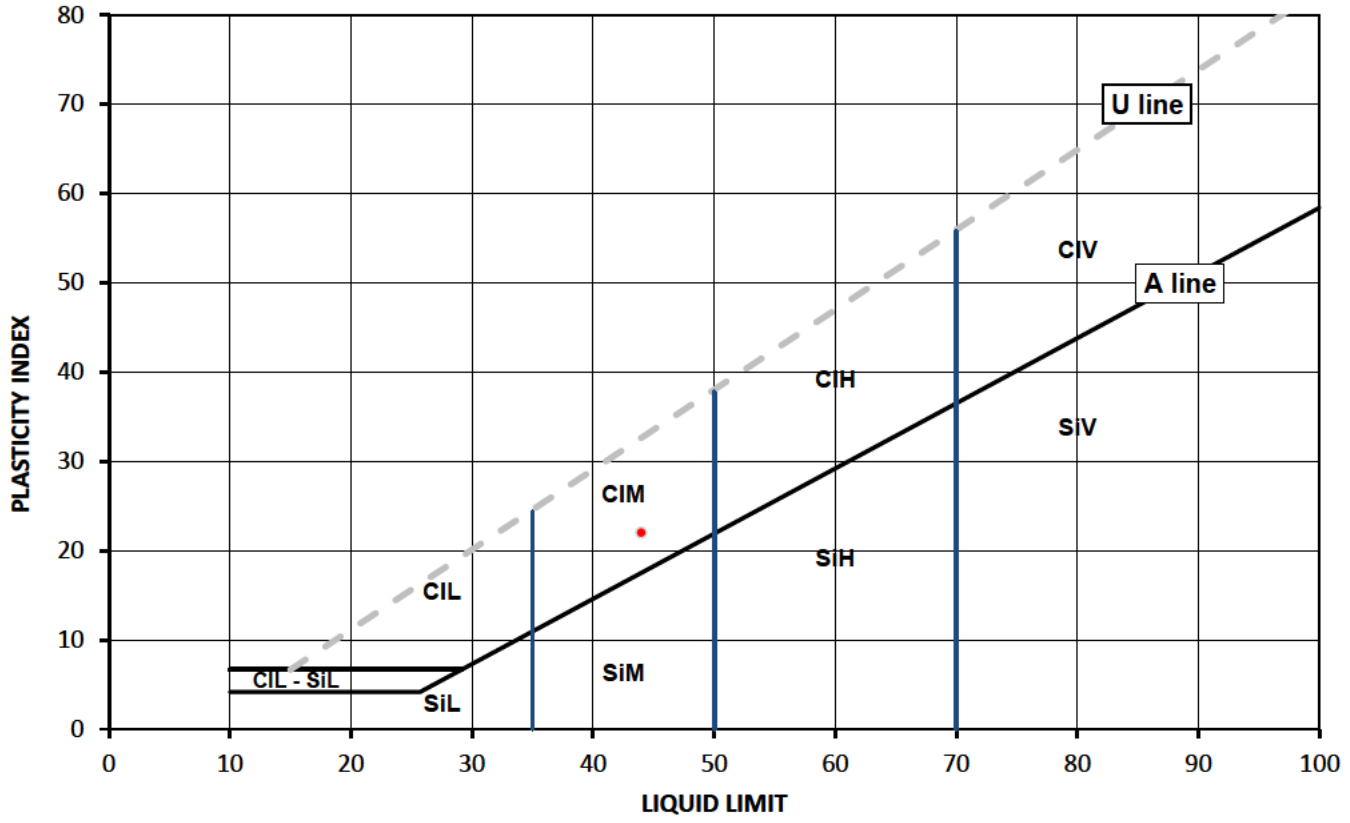
Client:	Shire Structures	Client Reference:	SS-25-14187
Client Address:	The Chapel, Barnsley Hall Road, Bromsgrove, B61 0SZ	Job Number:	25-050339-1
		Date Sampled:	29/08/2025
		Date Received:	19/09/2025
Contact:	Jack Stokes	Date Tested:	26/09/2025
Site Address:	Peckmill Farm	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	686147	Depth Top [m]:	1.00
Hole No.:	BH2	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly sandy CLAY		
Sample Preparation:	Tested after >0.425mm removed by hand; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
20.1	44	22	22	-0.09	1.09	99



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 13/10/2025

GF 337.16

i2 Analytical Ltd, Unit 8, Harrowden Road, Brackmills Industrial Estate, Northampton, NN4 7EB

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022, cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,cl 5.2 and 6

4041

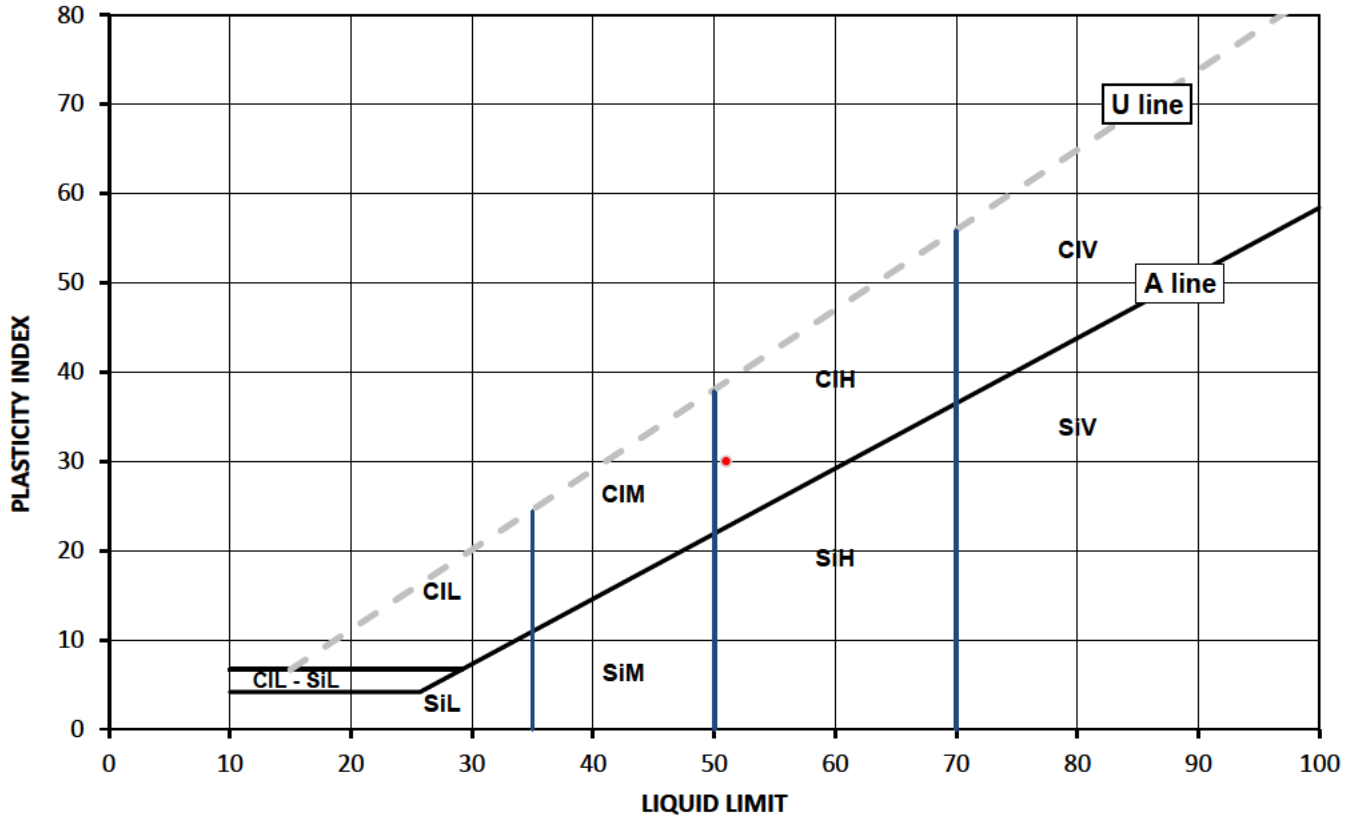
Client:	Shire Structures	Client Reference:	SS-25-14187
Client Address:	The Chapel, Barnsley Hall Road, Bromsgrove, B61 0SZ	Job Number:	25-050339-1
		Date Sampled:	29/08/2025
		Date Received:	19/09/2025
Contact:	Jack Stokes	Date Tested:	26/09/2025
Site Address:	Peckmill Farm	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	686151	Depth Top [m]:	3.00
Hole No.:	BH2	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly sandy CLAY		
Sample Preparation:	Tested in natural condition; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
20.7	51	21	30	0.00	1.00	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

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Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 13/10/2025

GF 337.16

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022, cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,cl 5.2 and 6

4041

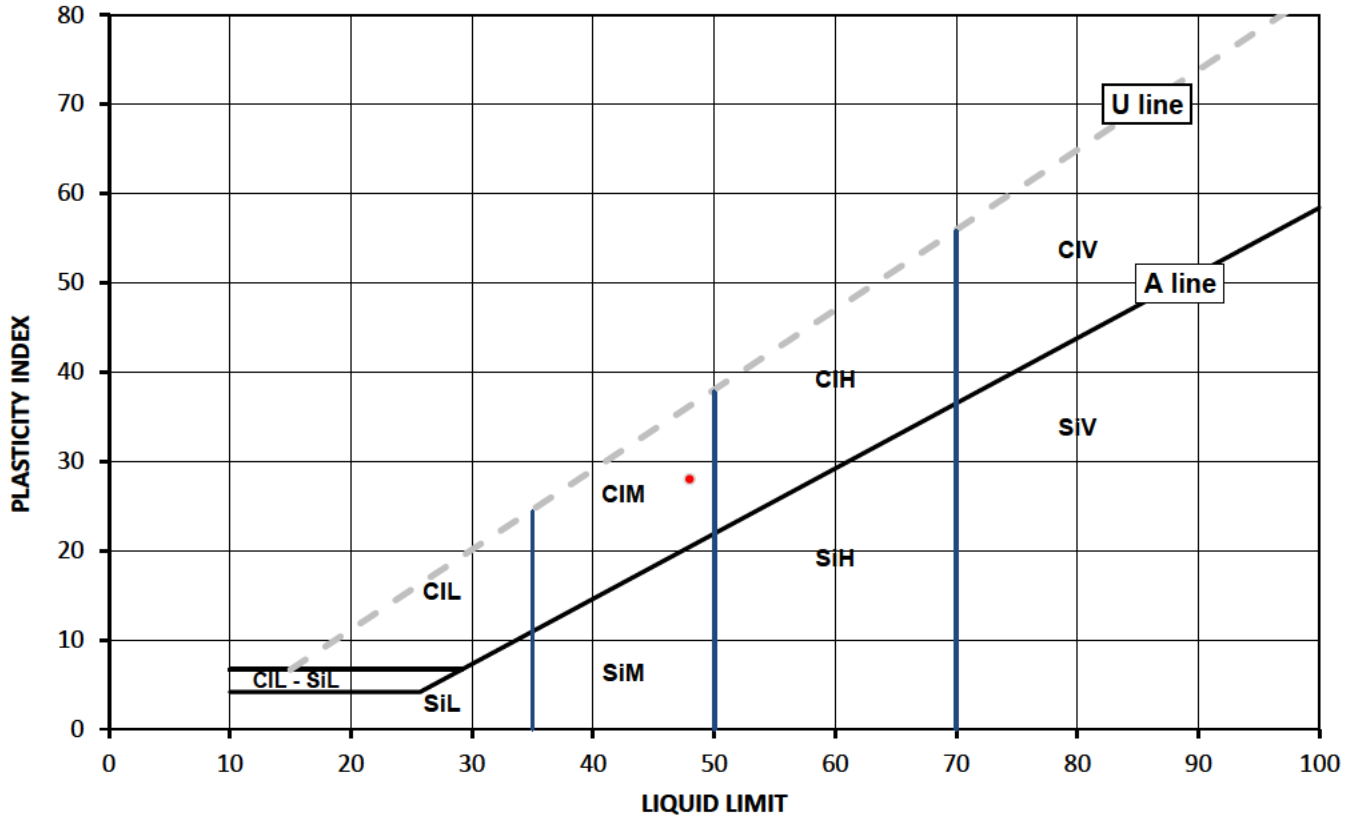
Client:	Shire Structures	Client Reference:	SS-25-14187
Client Address:	The Chapel, Barnsley Hall Road, Bromsgrove, B61 0SZ	Job Number:	25-050339-1
		Date Sampled:	29/08/2025
		Date Received:	19/09/2025
Contact:	Jack Stokes	Date Tested:	26/09/2025
Site Address:	Peckmill Farm	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	686155	Depth Top [m]:	5.00
Hole No.:	BH2	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly slightly sandy CLAY		
Sample Preparation:	Tested after >0.425mm removed by hand; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
22.0	48	20	28	0.07	0.93	99



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

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Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 13/10/2025

GF 337.16

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

BS EN ISO 17892-12:2018+A2:2022 cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022, cl 5.2 and 6. W by BS EN ISO 17892-1:2014+A1:2022.

Normec i2 Analytical

4041

Client: Shire Structures

Client Address: The Chapel, Barnsley Hall Road, Bromsgrove, B61 0SZ

Contact: Jack Stokes

Site Address: Peckmill Farm

Client Reference: SS-25-14187
Job Number: 25-050339-1
Date Sampled: 29/08/2025
Date Received: 19/09/2025
Date Tested: 26/09/2025
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	W	Liquid & Plastic Limit							Density		
		Reference	Depth Top m	Depth Base m	Type			%	% Passing 425um %	WL* %	Correlation Factor	Wp %	Ip %	Cone type	Sample Preparation	bulk Mg/m3	dry Mg/m3	PD Mg/m3
686147	BH2	Not Given	1.00	Not Given	D	Brown slightly gravelly sandy CLAY	Atterberg 4 Point	20.1	99	44	-	22	22	80g/30 deg	R / I			
686148	BH2	Not Given	1.50	Not Given	D	Brown CLAY		20.9										
686149	BH2	Not Given	2.00	Not Given	D	Brown CLAY		20.5										
686150	BH2	Not Given	2.50	Not Given	D	Brown CLAY		21.7										
686151	BH2	Not Given	3.00	Not Given	D	Brown slightly sandy CLAY	Atterberg 4 Point	20.7	100	51	-	21	30	80g/30 deg	N / I			
686152	BH2	Not Given	3.50	Not Given	D	Brown CLAY		22.0										
686153	BH2	Not Given	4.00	Not Given	D	Brown CLAY		21.0										
686154	BH2	Not Given	4.50	Not Given	D	Brown CLAY		21.7										
686155	BH2	Not Given	5.00	Not Given	D	Brown slightly gravelly slightly sandy CLAY	Atterberg 4 Point	22.0	99	48	-	20	28	80g/30 deg	R / I			

Note: # Non accredited; NP - Non plastic; N - Tested in natural condition, R - Tested after >0,425mm removed by hand, WR - Tested after washing to remove >425mm; I - The water content in the sample was increased , D - The water content in the sample was decreased; * - One point liquid limit corrected as per the report Correlation Factor by Clayton C.R.I and Jukes A.W (1978)

Comments:

Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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Date Reported: 13/10/2025 **GF 362.17**

SUMMARY REPORT

DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS EN ISO 17892-1:2014+A1:2022, BS 1377-2: 2022, clause 4.1

4041

Client: Shire Structures

Client Address: The Chapel, Barnsley Hall Road,
Bromsgrove, B61 0SZ

Contact: Jack Stokes

Site Address: Peckmill Farm

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: SS-25-14187
Job Number: 25-050339-1
Date Sampled: 29/08/2025
Date Received: 19/09/2025
Date Tested: 26/09/2025
Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC											
		Reference	Depth Top m	Depth Base m	Type			%											
686147	BH2	Not Given	1.00	Not Given	D	Brown slightly gravelly sandy CLAY		20.1											
686148	BH2	Not Given	1.50	Not Given	D	Brown CLAY		20.9											
686149	BH2	Not Given	2.00	Not Given	D	Brown CLAY		20.5											
686150	BH2	Not Given	2.50	Not Given	D	Brown CLAY		21.7											
686151	BH2	Not Given	3.00	Not Given	D	Brown slightly sandy CLAY		20.7											
686152	BH2	Not Given	3.50	Not Given	D	Brown CLAY		22.0											
686153	BH2	Not Given	4.00	Not Given	D	Brown CLAY		21.0											
686154	BH2	Not Given	4.50	Not Given	D	Brown CLAY		21.7											
686155	BH2	Not Given	5.00	Not Given	D	Brown slightly gravelly slightly sandy CLAY		22.0											

Comments:

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Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 13/10/2025

GF 126.20

i2 Analytical Ltd, Unit 8, Harrowden Road, Brackmills Industrial Estate, Northampton, NN4 7EB

SUMMARY REPORT

DETERMINATION OF MATRIX SUCTION - FILTER PAPER METHOD

Tested in Accordance with: BRE Information Paper IP4/93

Normec i2 Analytical

Client: Shire Structures
Client Address: The Chapel, Barnsley Hall Road, Bromsgrove, B61 0SZ
Contact: Jack Stokes
Site Address: Peckmill Farm

Client Reference: SS-25-14187
Job Number: 25-050339-1
Date Sampled: 29/08/2025
Date Received: 19/09/2025
Date Tested: 02/10/2025
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Sample				Filter Paper			Avg. Soil Matrix Suction
		Reference	Depth Top m	Depth Base m	Type			U or R	Bulk density Mg/m3	WC %	Time under seal days	Reference	Water Content %	Matrix Suction kPa	kPa
686151	BH2	Not Given	3.00	Not Given	D	Brown slightly sandy CLAY		U	2.00	21.6	6	TOP MIDDLE BASE	32.61 / 30.78 / 31.92	648 / 842 / 715	735
686152	BH2	Not Given	3.50	Not Given	D	Brown CLAY		U	1.90	22.5	6	TOP MIDDLE BASE	27.82 / 25.69 / 27.01	1290 / 1750 / 1450	1490
686153	BH2	Not Given	4.00	Not Given	D	Brown CLAY		U	2.06	21.4	6	TOP MIDDLE BASE	28.03 / 28.35 / 28.21	1250 / 1190 / 1220	1220

Note: U - test from undisturbed sample, R - test on recompacted/remoulded sample; WC - Water Content (BS 1377-2:1990 clause 3.2)

Comments:

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Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 13/10/2025

GF 183.10

i2 Analytical Ltd, Unit 8, Harrowden Road, Brackmills Industrial Estate, Northampton, NN4 7EB

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022, cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,cl 5.2 and 6

4041

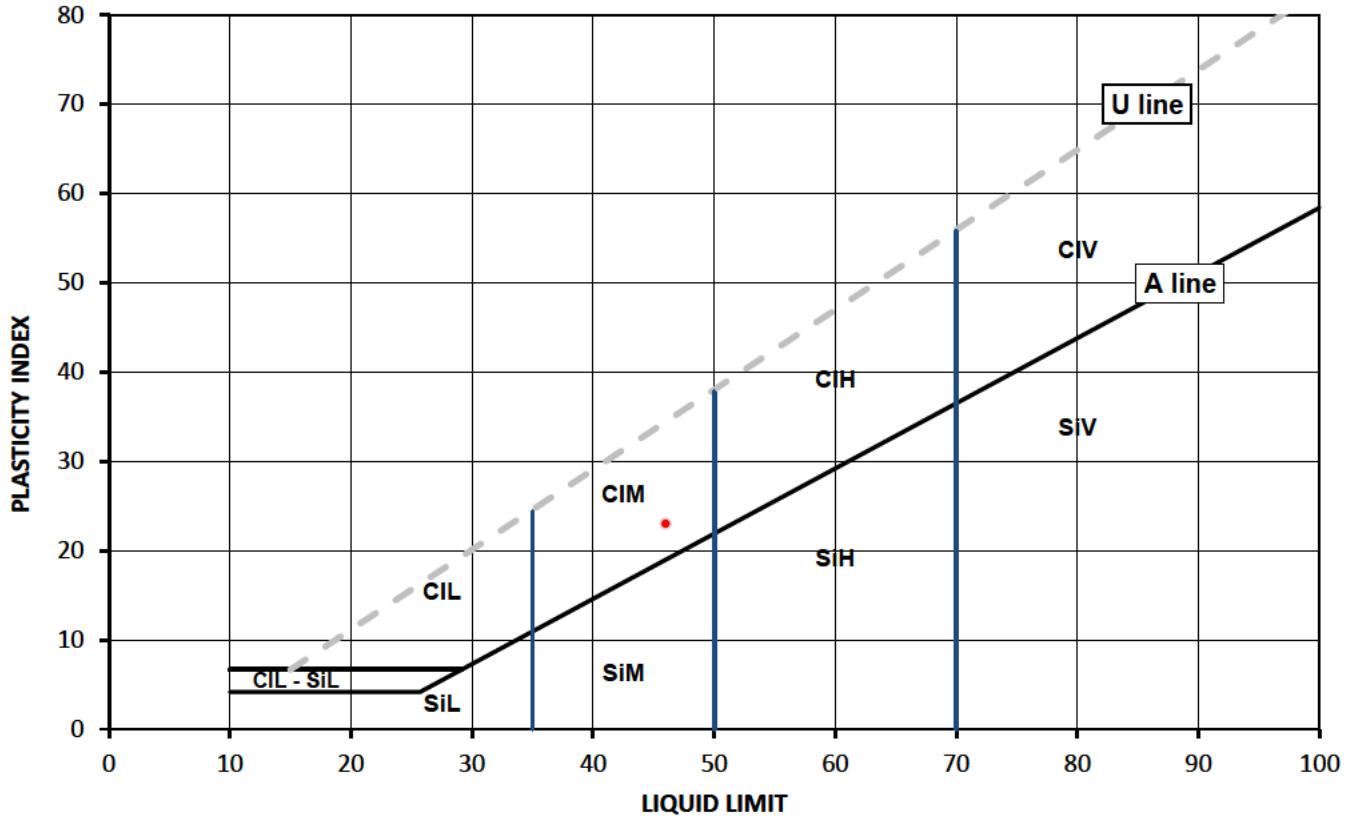
Client:	Shire Structures	Client Reference:	SS-25-14187
Client Address:	The Chapel, Barnsley Hall Road, Bromsgrove, B61 0SZ	Job Number:	25-050341-1
		Date Sampled:	11/09/2025
		Date Received:	19/09/2025
Contact:	Jack Stokes	Date Tested:	26/09/2025
Site Address:	Peckmill Farm	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	686161	Depth Top [m]:	1.50
Hole No.:	BH3	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly sandy CLAY		
Sample Preparation:	Tested in natural condition; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
18.7	46	23	23	-0.17	1.17	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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Date Reported: 13/10/2025

GF 337.16

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022, cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,cl 5.2 and 6

4041

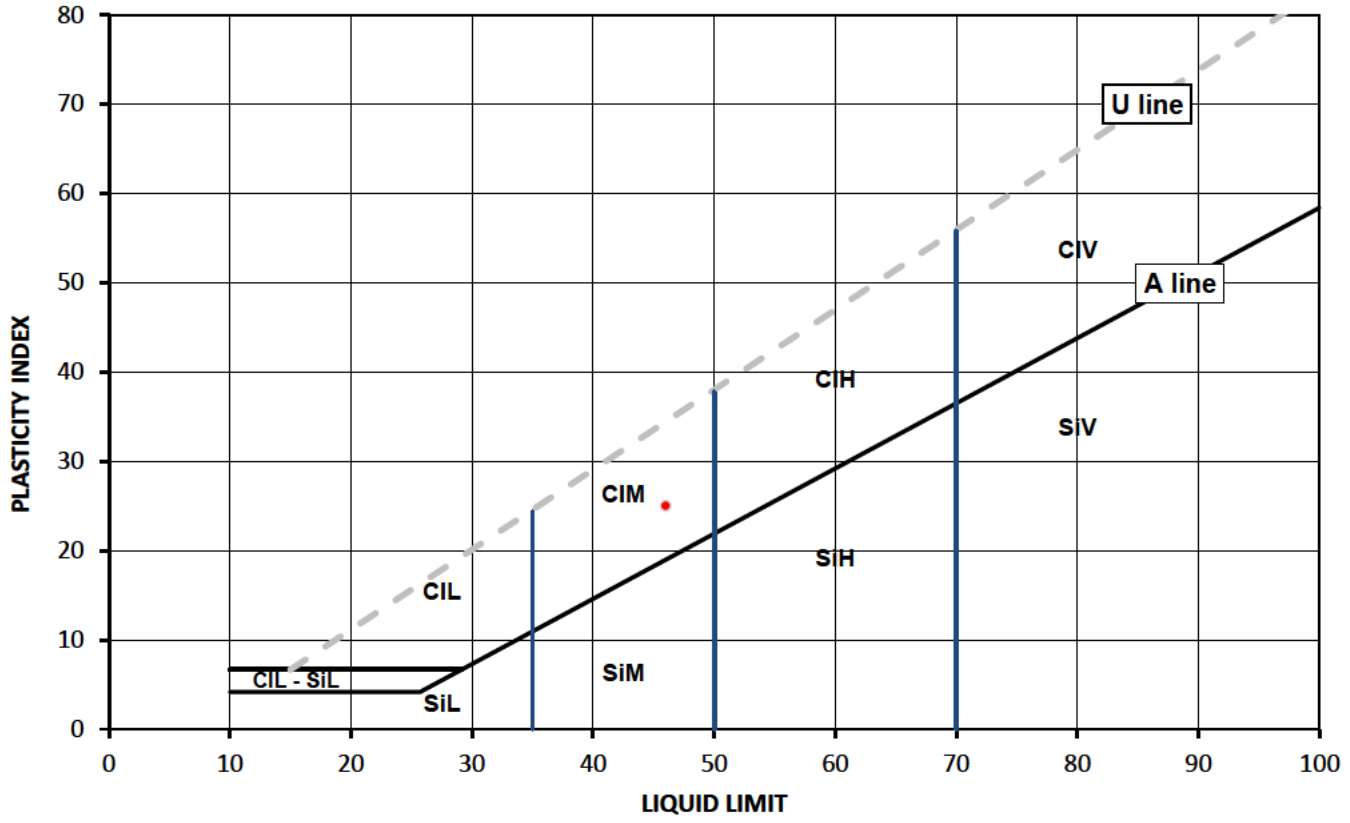
Client:	Shire Structures	Client Reference:	SS-25-14187
Client Address:	The Chapel, Barnsley Hall Road, Bromsgrove, B61 0SZ	Job Number:	25-050341-1
		Date Sampled:	11/09/2025
		Date Received:	19/09/2025
Contact:	Jack Stokes	Date Tested:	26/09/2025
Site Address:	Peckmill Farm	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	686163	Depth Top [m]:	2.50
Hole No.:	BH3	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly slightly sandy CLAY		
Sample Preparation:	Tested after >0.425mm removed by hand; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
19.7	46	21	25	-0.04	1.04	99



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

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Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 13/10/2025

GF 337.16

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022, cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,cl 5.2 and 6

4041

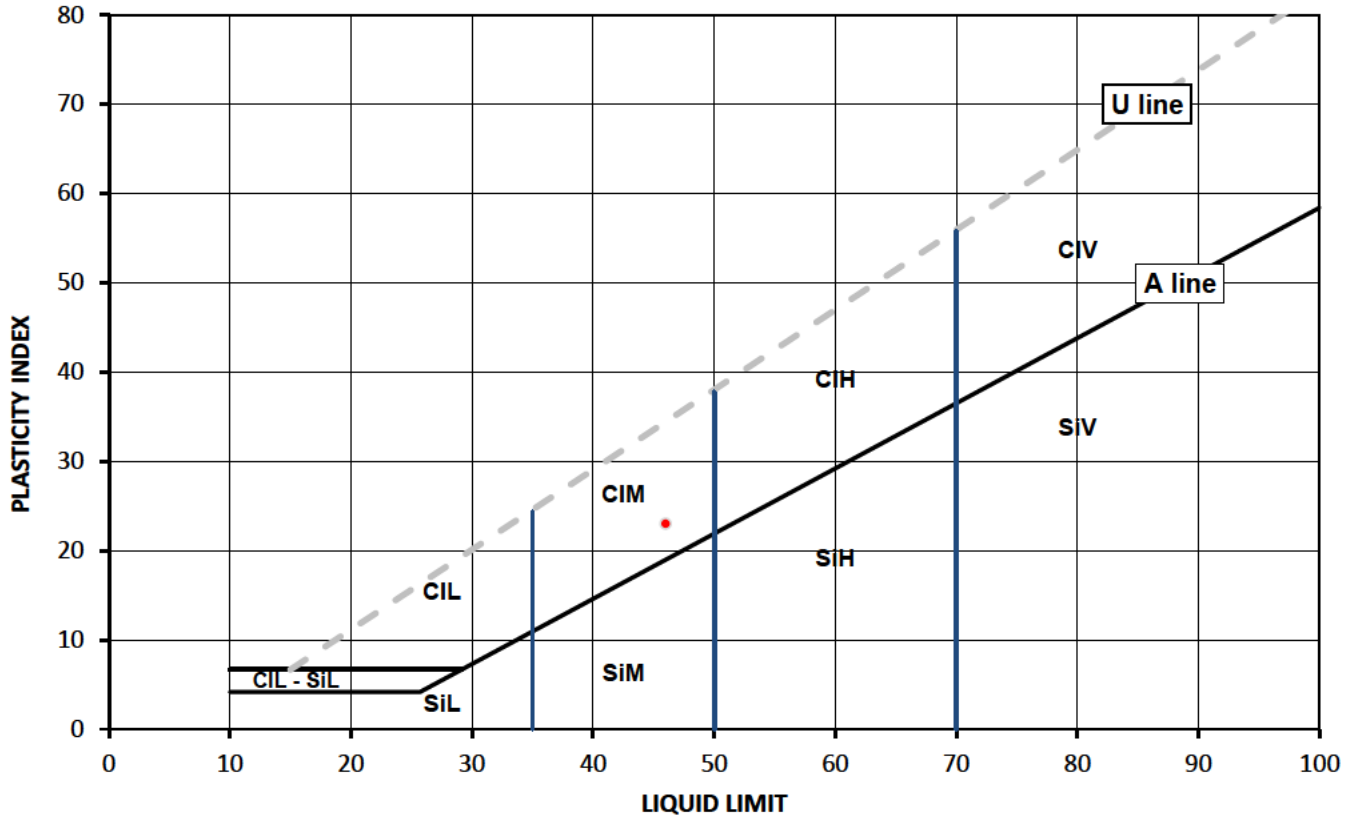
Client:	Shire Structures	Client Reference:	SS-25-14187
Client Address:	The Chapel, Barnsley Hall Road, Bromsgrove, B61 0SZ	Job Number:	25-050341-1
		Date Sampled:	11/09/2025
		Date Received:	19/09/2025
Contact:	Jack Stokes	Date Tested:	26/09/2025
Site Address:	Peckmill Farm	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	686165	Depth Top [m]:	3.50
Hole No.:	BH3	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly sandy CLAY		
Sample Preparation:	Tested in natural condition; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
19.8	46	23	23	-0.13	1.13	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 13/10/2025

GF 337.16

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

BS EN ISO 17892-12:2018+A2:2022 cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022, cl 5.2 and 6. W by BS EN ISO 17892-1:2014+A1:2022.

Normec i2 Analytical

4041

Client: Shire Structures

Client Address: The Chapel, Barnsley Hall Road, Bromsgrove, B61 0SZ

Contact: Jack Stokes

Site Address: Peckmill Farm

Client Reference: SS-25-14187
Job Number: 25-050341-1
Date Sampled: 11/09/2025
Date Received: 19/09/2025
Date Tested: 26/09/2025
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	W	Liquid & Plastic Limit							Density		
		Reference	Depth Top m	Depth Base m	Type			%	% Passing 425um %	WL* %	Correlation Factor	Wp %	Ip %	Cone type	Sample Preparation	bulk Mg/m3	dry Mg/m3	PD Mg/m3
686160	BH3	Not Given	1.00	Not Given	D	Brown CLAY		19.3										
686161	BH3	Not Given	1.50	Not Given	D	Brown slightly sandy CLAY	Atterberg 4 Point	18.7	100	46	-	23	23	80g/30 deg	N / I			
686162	BH3	Not Given	2.00	Not Given	D	Brown CLAY		20.8										
686163	BH3	Not Given	2.50	Not Given	D	Brown slightly gravelly slightly sandy CLAY	Atterberg 4 Point	19.7	99	46	-	21	25	80g/30 deg	R / I			
686164	BH3	Not Given	3.00	Not Given	D	Brown CLAY		20.8										
686165	BH3	Not Given	3.50	Not Given	D	Brown slightly sandy CLAY	Atterberg 4 Point	19.8	100	46	-	23	23	80g/30 deg	N / I			
686166	BH3	Not Given	4.00	Not Given	D	Brown CLAY		21.4										
686167	BH3	Not Given	4.50	Not Given	D	Brown CLAY		18.4										

Note: # Non accredited; NP - Non plastic; N - Tested in natural condition, R - Tested after >0,425mm removed by hand, WR - Tested after washing to remove >425mm; I - The water content in the sample was increased , D - The water content in the sample was decreased; * - One point liquid limit corrected as per the report Correlation Factor by Clayton C.R.I and Jukes A.W (1978)

Comments:

Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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Date Reported: 13/10/2025 **GF 362.17**

SUMMARY REPORT

DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS EN ISO 17892-1:2014+A1:2022, BS 1377-2: 2022, clause 4.1

4041

Client: Shire Structures

Client Address: The Chapel, Barnsley Hall Road,
Bromsgrove, B61 0SZ

Contact: Jack Stokes

Site Address: Peckmill Farm

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: SS-25-14187
Job Number: 25-050341-1
Date Sampled: 11/09/2025
Date Received: 19/09/2025
Date Tested: 26/09/2025
Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC											
		Reference	Depth Top m	Depth Base m	Type			%											
686160	BH3	Not Given	1.00	Not Given	D	Brown CLAY		19.3											
686161	BH3	Not Given	1.50	Not Given	D	Brown slightly sandy CLAY		18.7											
686162	BH3	Not Given	2.00	Not Given	D	Brown CLAY		20.8											
686163	BH3	Not Given	2.50	Not Given	D	Brown slightly gravelly slightly sandy CLAY		19.7											
686164	BH3	Not Given	3.00	Not Given	D	Brown CLAY		20.8											
686165	BH3	Not Given	3.50	Not Given	D	Brown slightly sandy CLAY		19.8											
686166	BH3	Not Given	4.00	Not Given	D	Brown CLAY		21.4											
686167	BH3	Not Given	4.50	Not Given	D	Brown CLAY		18.4											

Comments:

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Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 13/10/2025

GF 126.20

i2 Analytical Ltd, Unit 8, Harrowden Road, Brackmills Industrial Estate, Northampton, NN4 7EB

SUMMARY REPORT

DETERMINATION OF MATRIX SUCTION - FILTER PAPER METHOD

Tested in Accordance with: BRE Information Paper IP4/93

Normec i2 Analytical

Client: Shire Structures
Client Address: The Chapel, Barnsley Hall Road, Bromsgrove, B61 0SZ
Contact: Jack Stokes
Site Address: Peckmill Farm

Client Reference: SS-25-14187
Job Number: 25-050341-1
Date Sampled: 11/09/2025
Date Received: 19/09/2025
Date Tested: 02/10/2025
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Sample				Filter Paper			Avg. Soil Matrix Suction
		Reference	Depth Top m	Depth Base m	Type			U or R	Bulk density Mg/m3	WC %	Time under seal days	Reference	Water Content %	Matrix Suction kPa	kPa
686160	BH3	Not Given	1.00	Not Given	D	Brown CLAY		U	2.05	19.0	6	TOP MIDDLE BASE	30.28 / 30.64 / 31.91	905 / 859 / 716	827
686161	BH3	Not Given	1.50	Not Given	D	Brown slightly sandy CLAY		U	2.11	20.3	6	TOP MIDDLE BASE	32.54 / 33.67 / 33.01	655 / 557 / 612	608
686162	BH3	Not Given	2.00	Not Given	D	Brown CLAY		U	2.08	21.0	6	TOP MIDDLE BASE	29.90 / 30.35 / 28.58	955 / 896 / 1150	1000
686163	BH3	Not Given	2.50	Not Given	D	Brown slightly gravelly slightly sandy CLAY		U	2.00	20.9	6	TOP MIDDLE BASE	31.13 / 30.01 / 31.33	801 / 941 / 779	840
686165	BH3	Not Given	3.50	Not Given	D	Brown slightly sandy CLAY		U	1.99	21.0	6	TOP MIDDLE BASE	32.06 / 32.71 / 33.03	701 / 639 / 610	650

Note: U - test from undisturbed sample, R - test on recompacted/remoulded sample; WC - Water Content (BS 1377-2:1990 clause 3.2)

Comments:

Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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Date Reported: 13/10/2025

GF 183.10

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022, cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,cl 5.2 and 6

4041

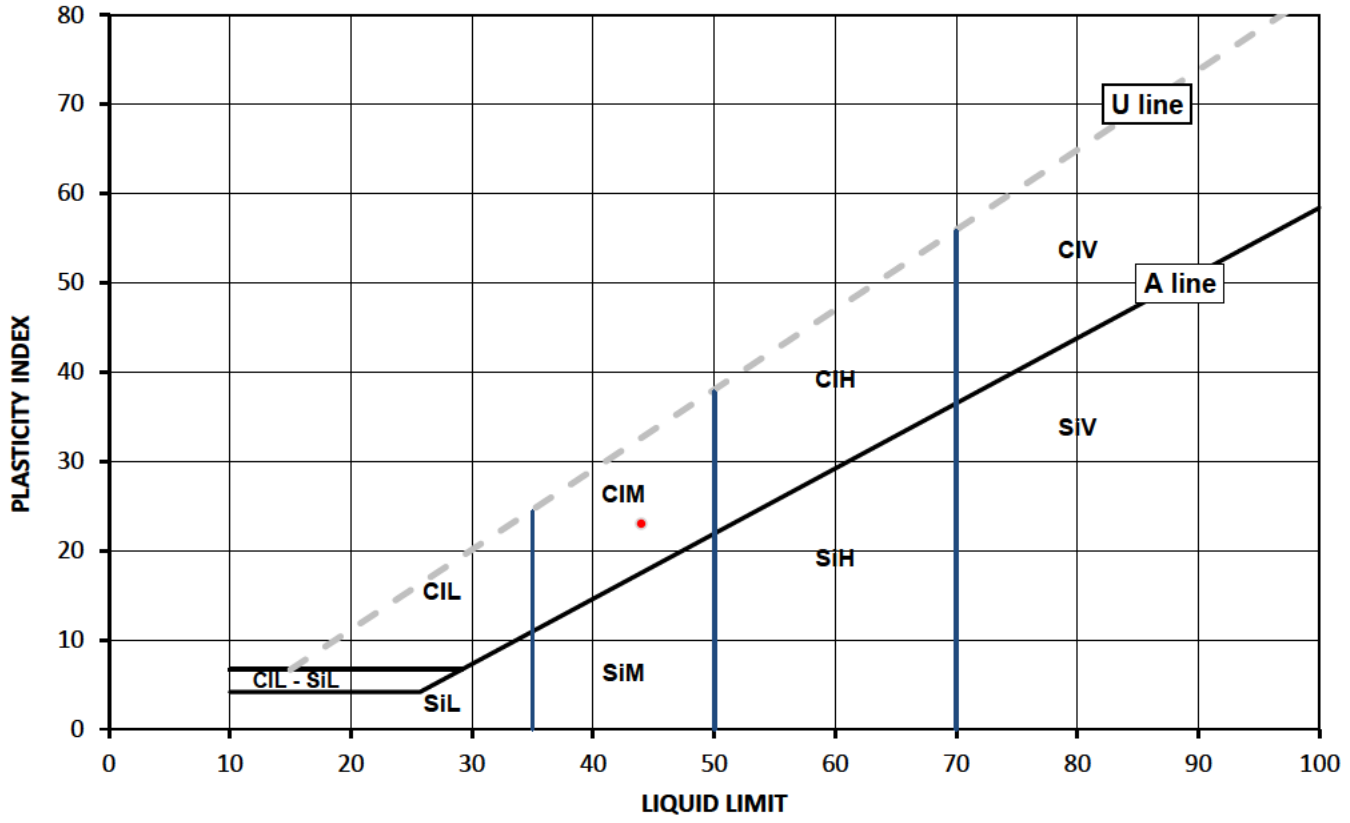
Client:	Shire Structures	Client Reference:	SS-25-14187
Client Address:	The Chapel, Barnsley Hall Road, Bromsgrove, B61 0SZ	Job Number:	25-050338-1
		Date Sampled:	11/09/2025
		Date Received:	19/09/2025
Contact:	Jack Stokes	Date Tested:	26/09/2025
Site Address:	Peckmill Farm	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	686138	Depth Top [m]:	1.00
Hole No.:	BH4	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly sandy CLAY		
Sample Preparation:	Tested after >0.425mm removed by hand; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
16.1	44	21	23	N/A	N/A	85



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

			Plasticity	Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 10/10/2025

GF 337.16

i2 Analytical Ltd, Unit 8, Harrowden Road, Brackmills Industrial Estate, Northampton, NN4 7EB

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022, cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,cl 5.2 and 6

4041

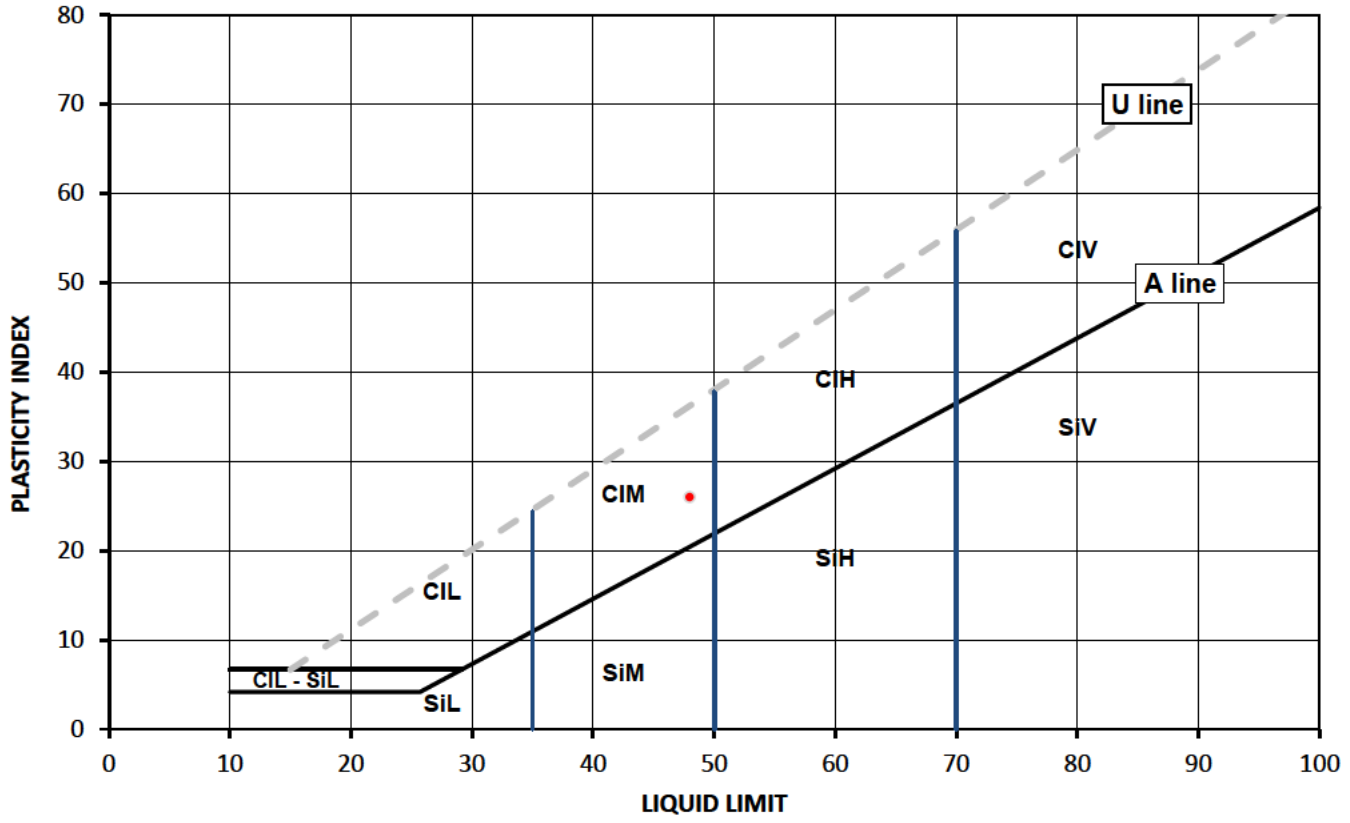
Client:	Shire Structures	Client Reference:	SS-25-14187
Client Address:	The Chapel, Barnsley Hall Road, Bromsgrove, B61 0SZ	Job Number:	25-050338-1
		Date Sampled:	11/09/2025
		Date Received:	19/09/2025
Contact:	Jack Stokes	Date Tested:	26/09/2025
Site Address:	Peckmill Farm	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	686142	Depth Top [m]:	3.00
Hole No.:	BH4	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly sandy CLAY		
Sample Preparation:	Tested in natural condition; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
22.1	48	22	26	N/A	N/A	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

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Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 10/10/2025

GF 337.16

i2 Analytical Ltd, Unit 8, Harrowden Road, Brackmills Industrial Estate, Northampton, NN4 7EB

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022, cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,cl 5.2 and 6

4041

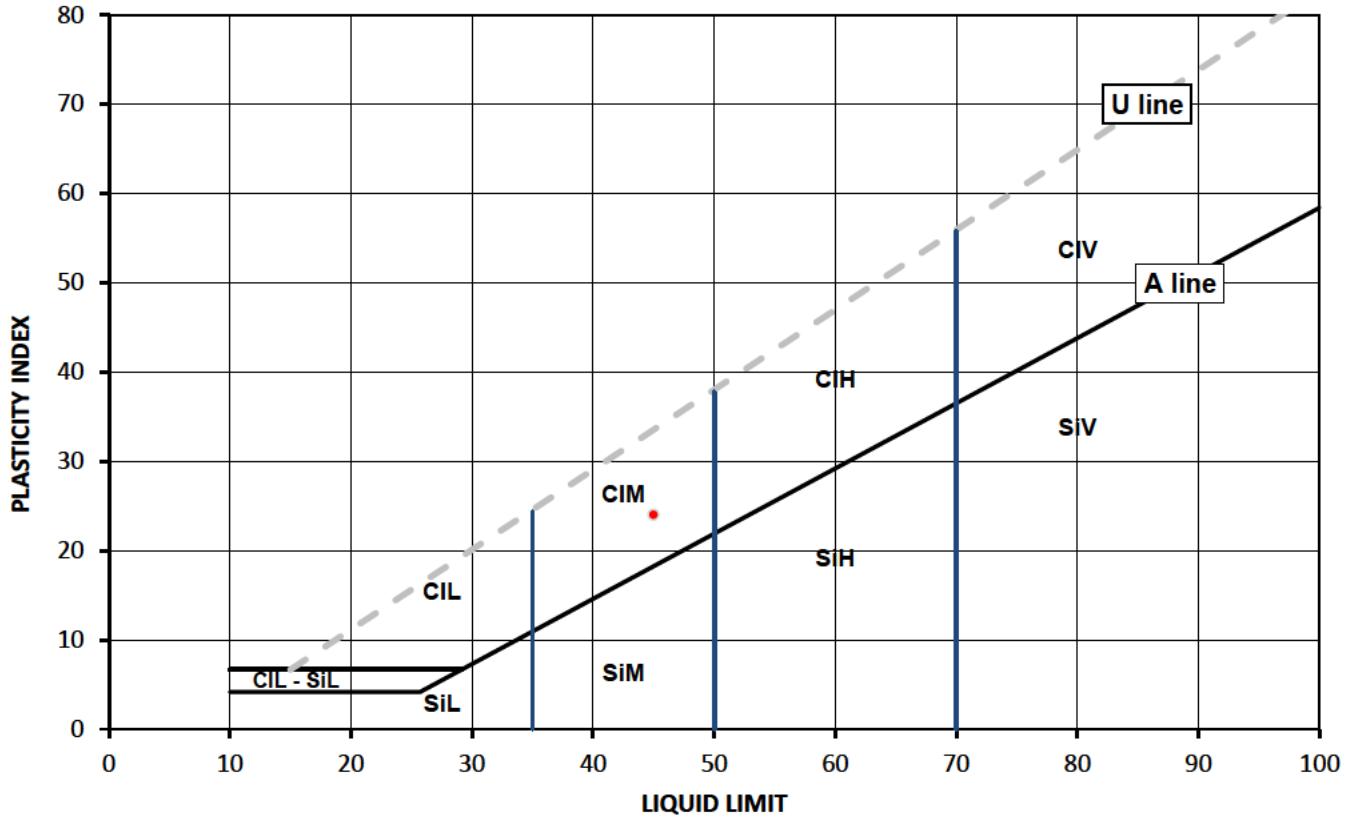
Client:	Shire Structures	Client Reference:	SS-25-14187
Client Address:	The Chapel, Barnsley Hall Road, Bromsgrove, B61 0SZ	Job Number:	25-050338-1
		Date Sampled:	11/09/2025
		Date Received:	19/09/2025
Contact:	Jack Stokes	Date Tested:	26/09/2025
Site Address:	Peckmill Farm	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	686146	Depth Top [m]:	5.00
Hole No.:	BH4	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brownish grey slightly gravelly slightlly sandy CLAY		
Sample Preparation:	Tested after >0.425mm removed by hand; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
18.0	45	21	24	-0.13	1.13	98



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

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Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 10/10/2025

GF 337.16

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

BS EN ISO 17892-12:2018+A2:2022 cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022, cl 5.2 and 6. W by BS EN ISO 17892-1:2014+A1:2022.

Normec i2 Analytical

4041

Client: Shire Structures

Client Address: The Chapel, Barnsley Hall Road, Bromsgrove, B61 0SZ

Contact: Jack Stokes

Site Address: Peckmill Farm

Client Reference: SS-25-14187
Job Number: 25-050338-1
Date Sampled: 11/09/2025
Date Received: 19/09/2025
Date Tested: 26/09/2025
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	W	Liquid & Plastic Limit							Density		
		Reference	Depth Top m	Depth Base m	Type			%	% Passing 425um %	WL* %	Correlation Factor	Wp %	Ip %	Cone type	Sample Preparation	bulk Mg/m3	dry Mg/m3	PD Mg/m3
686138	BH4	Not Given	1.00	Not Given	D	Brown slightly gravelly sandy CLAY	Atterberg 4 Point	16.1	85	44	-	21	23	80g/30 deg	R / I			
686139	BH4	Not Given	1.50	Not Given	D	Brown CLAY		19.8										
686140	BH4	Not Given	2.00	Not Given	D	Brown slightly sandy CLAY		17.9										
686141	BH4	Not Given	2.50	Not Given	D	Brown slightly gravelly CLAY		21.2										
686142	BH4	Not Given	3.00	Not Given	D	Brown slightly sandy CLAY	Atterberg 4 Point	22.1	100	48	-	22	26	80g/30 deg	N / I			
686143	BH4	Not Given	3.50	Not Given	D	Brown CLAY		19.7										
686144	BH4	Not Given	4.00	Not Given	D	Brown CLAY		21.8										
686145	BH4	Not Given	4.50	Not Given	D	Brownish grey CLAY		20.1										
686146	BH4	Not Given	5.00	Not Given	D	Brownish grey slightly gravelly slightlly sandy CLAY	Atterberg 4 Point	18.0	98	45	-	21	24	80g/30 deg	R / I			

Note: # Non accredited; NP - Non plastic; N - Tested in natural condition, R - Tested after >0,425mm removed by hand, WR - Tested after washing to remove >425mm; I - The water content in the sample was increased , D - The water content in the sample was decreased; * - One point liquid limit corrected as per the report Correlation Factor by Clayton C.R.I and Jukes A.W (1978)

Comments:

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[redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 10/10/2025 **GF 362.17**

SUMMARY REPORT

DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS EN ISO 17892-1:2014+A1:2022, BS 1377-2: 2022, clause 4.1

4041

Client: Shire Structures

Client Address: The Chapel, Barnsley Hall Road,
Bromsgrove, B61 0SZ

Contact: Jack Stokes

Site Address: Peckmill Farm

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: SS-25-14187
Job Number: 25-050338-1
Date Sampled: 11/09/2025
Date Received: 19/09/2025
Date Tested: 26/09/2025
Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC											
		Reference	Depth Top m	Depth Base m	Type			%											
686138	BH4	Not Given	1.00	Not Given	D	Brown slightly gravelly sandy CLAY		16.1											
686139	BH4	Not Given	1.50	Not Given	D	Brown CLAY		19.8											
686140	BH4	Not Given	2.00	Not Given	D	Brown slightly sandy CLAY		17.9											
686141	BH4	Not Given	2.50	Not Given	D	Brown slightly gravelly CLAY		21.2											
686142	BH4	Not Given	3.00	Not Given	D	Brown slightly sandy CLAY		22.1											
686143	BH4	Not Given	3.50	Not Given	D	Brown CLAY		19.7											
686144	BH4	Not Given	4.00	Not Given	D	Brown CLAY		21.8											
686145	BH4	Not Given	4.50	Not Given	D	Brownish grey CLAY		20.1											
686146	BH4	Not Given	5.00	Not Given	D	Brownish grey slightly gravelly slightlly sandy CLAY		18.0											

Comments:

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Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 10/10/2025

GF 126.20

SUMMARY REPORT

DETERMINATION OF MATRIX SUCTION - FILTER PAPER METHOD

Tested in Accordance with: BRE Information Paper IP4/93

Normec i2 Analytical

Client: Shire Structures
Client Address: The Chapel, Barnsley Hall Road, Bromsgrove, B61 0SZ
Contact: Jack Stokes
Site Address: Peckmill Farm

Client Reference: SS-25-14187
Job Number: 25-050338-1
Date Sampled: 11/09/2025
Date Received: 19/09/2025
Date Tested: 01/10/2025
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Sample				Filter Paper			Avg. Soil Matrix Suction
		Reference	Depth Top m	Depth Base m	Type			U or R	Bulk density Mg/m3	WC %	Time under seal days	Reference	Water Content %	Matrix Suction kPa	kPa
686140	BH4	Not Given	2.00	Not Given	D	Brown slightly sandy CLAY		U	2.01	17.5	6	TOP MIDDLE BASE	28.64 / 29.14 / 29.32	1140 / 1070 / 1040	1080
686141	BH4	Not Given	2.50	Not Given	D	Brown slightly gravelly CLAY		U	1.86	20.6	6	TOP MIDDLE BASE	30.41 / 29.59 / 30.22	888 / 999 / 913	933
686143	BH4	Not Given	3.50	Not Given	D	Brown CLAY		U	2.06	21.1	6	TOP MIDDLE BASE	31.79 / 31.33 / 31.48	729 / 779 / 762	756
686145	BH4	Not Given	4.50	Not Given	D	Brownish grey CLAY		U	2.05	21.7	6	TOP MIDDLE BASE	33.47 / 31.97 / 32.32	573 / 710 / 676	653
686146	BH4	Not Given	5.00	Not Given	D	Brownish grey slightly gravelly slightlly sandy CLAY		U	2.05	20.3	6	TOP MIDDLE BASE	31.83 / 32.02 / 31.52	725 / 705 / 758	729

Note: U - test from undisturbed sample, R - test on recompacted/remoulded sample; WC - Water Content (BS 1377-2:1990 clause 3.2)

Comments:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed: [redacted]

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 10/10/2025

GF 183.10