Hutton + Rostron
Environmental Investigations Limited

The Pest House: Penetrating damp and retained moisture investigation

Site note 1 for 27 November 2018, job no. 148.73

CONTENTS

Attachments

Distribution:

Ray Pearson – Dandara Ltd

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1 INTRODUCTION

1.1 AUTHORITY AND REFERENCE

Hutton + Rostron Environmental Investigations Limited carried out a site visit to The Pest House on 27 November 2018 in accordance with instructions from Ray Pearson of Dandara by email, on 25 June 2018 (08:04). Drawings provided by Dandara, ref 150.01 – 150.06 were used for the identification of structures. For the purpose of orientation in this report, the building was taken as facing north

1.2 AIM

The aim of this site visit was to assess the distribution of residual moisture in load bearing masonry structures and make recommendations for cost effective remedial works, to prevent problems of damp and decay on occupancy

1.3 LIMITATIONS

Structures were not examined in detail except as described in this report, and no liability can be accepted for defects that may exist in other parts of the building. We have not inspected woodwork or other parts of the structure which are covered, unexposed or inaccessible and we are therefore unable to report that any such part of the property is free from defect or in the event that such part of the property is not free from defect it will not contaminate and/or affect any other part of the property. Any design work carried out in conjunction with this report has taken account of available pre-construction or construction phase information to assist in the management of health and safety risks. The sample remedial details and other recommendations in this report are included to advise and inform the design team appointed by the client. The contents of this report do not imply the adoption of the role of Principal Designer by H+R for the purposes of the Construction Design and Management (CDM) Regulations 2015

2 STAFF ON SITE AND CONTACTS

2.1 H+R STAFF ON SITE

Andy Wade
Andrew Ellis
Isabel Mar
Joe Lovelock

2.2 PERSONNEL CONTACTED

Ray Pearson – Dandara Ltd
Eleanor Lakew –Principal Conservation Officer, Maidstone Borough Council

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3 OBSERVATIONS AND RECOMMENDATIONS

These observations and recommendations are in addition to those made in other H+R site notes. Where commented upon in detail in other site notes, similar features or defects will not be referred to in this site note

Note 1: Observations were made from ground level, with no special provisions for access provided

Note 2: Locations and pictorial views of observations made are shown in the Photographs at Attachment A and Plans at Attachment B

Note 3: Recommendations are in addition to the General Recommendation shown in section 4

Note 4: It was understood by H+R that parts of the structure were due for demolition and were therefore not included in the scope of this survey

3.1 EXTERIORS

3.1.1 Roof coverings and chimney

Detailed access was not available at the time of the survey. Observations were made from ground level or through windows from the interior. Both the main and catslide roof coverings appeared to be of fired clay tile construction with lead flashing. Their condition could not be assessed in detail from ground level but showed little evidence of localised failure due to slipped, defective or missing slates and/or defective flashing. Thick moss growth was identified to the north pitch. However, this would unlikely to be causing damp problems to the interior but may block roof drainage systems in the future if moss becomes detached from the roof and collects within the gutters. The eaves at the east corner of the south pitch and all along the base of the catslide roof showed a number of defective tiles which may be allowing water ingress

The roof structure to the ground floor extension at the south showed evidence of greater failure which had led to more significant water ingress to the interior. It was understood that this ground floor extension was due to be demolished as part of the current refurbishment programme, however damp penetration that has already occurred to masonry may still affect parts of the structure that a due to be retained

Masonry to the chimney at the west side of the structure showed evidence of chronically damp-affected brickwork. Mortar fillets at the joints of the chimney and roof appeared to be defective and may be allowing water ingress into the building

Allowance should be made for detailed inspection of all roof coverings by H+R when access becomes available. During any roofing works, the building should be kept weathertight as a matter of priority to prevent damp penetration to the structure below. Allowance should be made for the repair of slipped or missing tiles, and for new flashings, where necessary. Consideration should be given to cleaning any moss and plant growth from the slates to reduce the risk of blockage to gutters on future occupancy

Allowance should also be made for detailed inspection of any chimneystacks, haunchings and flues on provision of access

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3.1.2 Roof drainage systems

Detailed access was not available at the time of the survey. Where visible, the majority of all gutters and downpipes appeared to be of plastic construction and were generally blocked or were vulnerable to blockage throughout due to poor maintenance in the past. There were no provisions at all for rain water goods at the eaves of the catslide roof. This had led to many areas of significantly damp areas of masonry, as detailed on the Elevations at Attachment B

Allowance should be made for the extensive refurbishment or replacement of all gutters and downpipes. An adjustment may be required to the gutter falls to ensure that roof drainage water is discharged clear of the structure. Upon completion of refurbishment works, allowance should be made for routine cleaning and regular maintenance of the rainwater system to ensure that surface water is drained clear of the structure. Consideration should be given to replacing the provision for roof drainage based on up-to-date rainfall data and roof drainage calculations. H+R can provide further advice if required

3.1.3 Façade masonry

Facades were constructed from contemporary fair-faced brickwork at ground floor level and vertical clay tiles at first floor level. Behind the tiles and brickwork was an older, timber-framed structure. Pointing appeared to be of a cementitious material which may cause the premature spalling of the brickwork due to its relatively low permeability. However, at the time of the survey the brickwork and bedding mortar appeared to be in good condition, with the exception of light salt- and damp- affected masonry beneath defective downpipes/gutters. The floor/wall junction in a number of locations had deteriorated over time and left the areas vulnerable to water ingress through any gaps into the base of the wall and foundations. Extensive plant growth to large areas of all elevations was identified. This was caused by chronically damp conditions at the base of the walls due to defective roof drainage systems above. Some of the larger shrubs may be affecting the integrity of the foundations due to the expanse of their root systems

Facades to the ground floor extension at the south were not investigated as the structure was due for demolition

Future allowance should be made for localised re-pointing using remedial lime mortars to match existing. Loose, defective or cementitious pointing within, say, 1m of ground level should also be raked out and replaced in a suitable lime mortar mix, taking care to effectively weather the shoulder of the skirting at the base of the façade. In conjunction with the design specification for future landscaping of the ground around the base of the walls, the floor/wall junction should be detailed so as to prevent run-off surface water entering through open joints and draining to the foundations beneath. Consideration may be also be given to the cleaning/removal of salt efflorescence to the brickwork, if desired for aesthetic reasons. All unwanted plant and algal growth should be removed and any damage revealed repaired as described above

3.1.4 External ground levels and drainage

It should be assumed that all surface drainage systems are blocked or vulnerable to blockage. External ground levels were generally close to that of the internal ground floor, leaving them vulnerable to damp penetration. The external ground was a mixture of unmade ground and hardstanding materials. Hardstanding showed evidence of extensive failure to the surface of the materials, as well as defects to the floor/wall junctions to the main structure which would be allowing water ingress into the base of the walls and foundations. It was not possible to determine the fall of the ground around the exterior of the elevations due to overgrown plants and unmade ground

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Allowance should be made for reducing existing elevated ground levels to at least 150mm below any physical damp-proof course or internal floor levels, whichever is the lower, at an early stage during enabling works in consultation with the Structural Engineer. Consideration may be given to the installation of a French/air drain system as an alternative where appropriate. Perforated drainage pipes at the bases of the drainage trenches should be detailed to discharge to suitable soakaways or water courses, generally to comply with current Building Regulations and local bylaws. Alternatively, an 'ACO'-type drain may also be installed. Allowance should also be made for detailed inspection of all ground and surface drainage gulleys and pipe-work to be retained on refurbishment, using CCTV equipment as required, followed by cleaning and repair. Drainage systems should be subject to frequent routine inspection and certified as clear and operating effectively on completion of refurbishment works. Any external paving installed should be detailed to effectively drain surface water to below ground drainage systems, directing water away from the masonry and foundations of the structure

3.1.5 Damp-proof course

A mixture of slate and what appeared to a bituminous physical horizontal DPC was identified along all elevations. Generally, where visible, the DPC was approximately 1no. brick course above the level of the external ground. However, due to rising external ground levels, the DPC had become bridged in a number of locations

No immediate action required at this stage. Provisional allowance may need to be made for the installation of vertical damp-proof membranes behind dry linings on the interior to the ground floor and to provision of additional surface drains (see 3.1.4 and 3.2 for details)

No wall irrigations or chemical injected damp-proof courses are required or recommended

3.2 INTERIORS

Note: The condition of the floor structures are described in HR's site note 3 and will not be repeated here

Interior decorative finishes were a mixture of painted hard plaster and plaster infill panels. Generally, the interiors on both floors were free from evidence of significant damp problems, with the exception the north-west corner of the master bedroom. Any signs of damp were likely to be caused by a combination of water ingress from defective roof coverings and roof drainage systems, as well as condensation from previous inoccupancy. Damp and cyclical salt efflorescence had caused decorative finishes to become detached from the surface of the wall in localised areas. Mould growth was identified in a small number of locations

It was understood that the solid floor to the ground floor extension at the south was due to be retained. Where accessible, the floor structure appeared to be of laid concrete to a depth of at least 150mm. The surface saw a screed to a depth of approximately 20-25mm. No physical damp-proof membrane was identified on inspection. However, there may have been one present but not visible at the time of the survey

The location and details of damp are shown in the photographs at Attachment A and plans at Attachment B

1 General: Allowance should be made for removal of any defective existing decorative finishes and for repair of wall surfaces beneath, subject to the general specification for refurbishment and permission from the Conservation Officer

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2 *Ground and upper floor walls: Allowance should be made for the installation of a ventilated dry-lining system, based on studded plastic vertical damp-proof membranes to all areas with masonry shown to be damp and/or masonry with raised hygroscopic salt contents (see 3.3 below). Membranes should extend to at least 1.0 m above external ground level. Any skirting, dado rails and covings at the perimeters of the vertical separating membranes behind the dry linings should be detailed to provide continuous ventilation to the interface between the wall masonry and the vertical membrane, to allow residual moisture to disperse on occupancy. If floor structures are to be replaced, the vertical damp-proof membranes included behind the dry linings should be extended downwards as far as possible over the footings. Any horizontal damp-proof membrane included in the refurbishment of floor structures should be lapped a minimum of 500mm up the inside faces of the wall membranes at the wall/floor junctions. H+R can provide further advice on remedial detailing if required. Suitable membrane products are available John Newton & Co Ltd (tel: 0207 237 1217, www.newton-and-co.co.uk) or similar products from Delta Membrane Systems Ltd (tel: 01992 523811, www.deltamembranes.co.uk), Triton Chemicals Ltd (tel: 0208 310 3929, www.triton-chemicals.com) and others*

Note that only those structures identified as containing raised levels of residual moisture or hygroscopic salts on plans at Attachment B need be detailed with ventilated dry linings. Extension of the dry lining to other structures may be considered for consistency of appearance and finish and to provide additional protection against ground moisture penetration or hygroscopic salt migration should sub-soil conditions change or localised external flooding occur on occupancy

It is important to note that any internal lining system will not by itself damage or compromise any original timber frame elements at ground floor level. H+R can provide detailing advice based on conservation principles

3 *Timber: Allowance should be made for removing and reinstating timber door frames, skirting and other structural or decorative timber elements in contact with damp affected masonry and for reinstatement with timber isolated from masonry by a through ventilated air gap and plastic packing wedges or a continuous damp-proof material. This may include the vertical membrane included in any proposed dry lining (see above). Consideration should also be given to adhesive fixing of decorative timbers over dry linings, to prevent unnecessary damage to the wall membranes. Door frames should be cut back around 10mm from ground bearing solid floor structures where the presence of an effective horizontal damp-proof membrane has not been confirmed, with the gap filled with a suitable adhesive waterproof sealant. This detail is superfluous where floor structures are to be replaced over new damp-proof membranes*

4 *Floor finishes: Any future vulnerable finishes, such as laminate or solid timber flooring, to be laid on retained ground bearing solid floors, should be isolated from floor structures by a low profile studded plastic membrane or a proprietary damp-resistant underlay. Any horizontal damp-proof membranes included in proposed floor structures should be lapped up the inside face of the membrane behind the skirting boards. This is intended to create a drying and efflorescence zone behind the studded membrane, to reduce the risk of upward moisture and salt migration from wall/floor junctions. If existing solid floors are to be replaced, allowance will need to be made incorporating H+R's remedial detailing advice for damp-proofing*

5 *Chimneys: All redundant flues should be opened and cleared as soon as possible during enabling and refurbishment works so as to allow through ventilation and drying. All redundant flues should be capped with cowls so as to minimise water penetration but provided with permanent through ventilation during and after refurbishment, to prevent moisture accumulation in the chimney structures. H+R can advise further on detailing if required*

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6 *Background ventilation: Adequate provision for background ventilation to all areas should be made to meet the requirements of current Building Regulations. Consideration should be given to making provision for 'trickle ventilation' through refurbished windows and/or providing catches to allow them to be securely locked in a partially open position so as to allow through and cross ventilation even during periods of reduced occupancy. H+R can advise further on remedial detailing when required*

7 *Mechanical ventilation: Extractor fans and ducts should be installed so as to discharge moisture laden air directly to the exterior from all bathrooms, showers, laundries, kitchens, WCs and utility rooms, fully in accordance with the requirements of current Building Regulations. These should be tested and certified as operating in accordance of the requirements of current Building Regulations by the project manager on completion. Particular care should be taken to provide adequate background ventilation to provide 'make-up' air to allow the efficient operation of extractor fans in bathrooms, showers and laundries. This may be done by forming a vent gap of at least 10mm wide beneath internal door openings after laying of floor surfaces and finishes*

8 *Mould growth: Any surface mould deposits should be cleaned using a 10 per cent solution of sodium hypochlorite or household bleach in cold water. Personnel carrying out cleaning work should be provided with suitable protective clothing and gloves. If a significant delay is anticipated prior to refurbishment, allowance should be made for provision of temporary background heating to be run at a constant low level, to discourage intermittent condensation and mould growth caused by natural changes in relative humidity*

3.3 MASONRY MOISTURE ANALYSIS

3.3.1 Sampling

Note 1: External walls that had plaster infill panels could not be sampled

A total of 14no. masonry samples were taken from representative internal load bearing structures and external walls of the ground floor, as well as the concrete slabs in bedroom 2 and the ground floor extension at the south. Samples were double bagged and returned to H+R's laboratory for gravimetric analysis of available and hygroscopic moisture content, following procedures set out in BRE Digest 245. Results are shown on plans at Attachment B and in a table at Attachment C

3.3.2 Results

1 Available moisture contents: All samples extracted were found to have available moisture contents of less than 2 per cent, classified by H+R as 'dry'

2 Hygroscopic moisture: 6no. samples on the ground floor and concrete floors were found to have hygroscopic salt contents above 2 per cent. Isolated concentrations of hygroscopic salt would have tended to draw airborne moisture into the wall surface intermittently, supporting the cyclical salt efflorescence and damaging surface finishes. Locations are shown on the Plans at Attachment B

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4 GENERAL RECOMMENDATIONS

All new and refurbishment detailing should be assessed for its effect on environmental and structural health. General principles are set out below. Special care is required when introducing new materials, moisture sources or heating and ventilation systems, for example air conditioning

4.1 ROOF AND SURFACE DRAINAGE

4.1.1 Maintenance

All guttering, hopper heads and outlets should be regularly checked and cleared to keep them free of debris, especially during the autumn months

4.1.2 Protection

Hopper heads, gutter outlets and ground gullies should be protected with metal mesh cages so as to prevent blockage and overflow. These should extend higher than the expected water level to reduce the tendency to block and should be easily removable to allow cleaning and maintenance

4.1.3 Overflows

Hopper heads, parapet gutter outlets and valley gutter outlets should be fitted with overflow pipes to drain water clear of the structure in case of blockage. These should be at a level below that at which water would overflow the roof flashings

4.1.4 Roof drainage calculations

Roof drainage calculations should be made to check the adequacy of gutters, drains and downpipes so that their capacities may be increased if necessary during refurbishment. H+R can carry out these calculations if required

4.2 VENTILATION

4.2.1 Structural voids

All structural voids within the building should be provided with adequate through ventilation so as to prevent moisture build-up. This must be done with regard to the applicable fire regulations

4.2.2 Chimneys

All chimneys not in use should be capped so as to minimise water ingress but so as to allow maximum ventilation of the flues. Flues should be cleared and cleaned to remove blockages. Fireplaces and chimney breasts should be opened or vented to allow through-ventilation of the flues. This prevents moisture build-up in the flues and helps interior ventilation by the stack effect

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4.2.3 Bathrooms and kitchens

All bathrooms and kitchens should be fitted with adequate extractor fan systems. These should run for at least fifteen minutes after occupancy to prevent condensation. The installation of floor drains should be considered in these rooms in case of overflow

4.2.4 Roof spaces

All roof spaces, including flat roof areas and gutter soles, should be provided with adequate through-ventilation. This may occur via the gaps between slates in unsarked pitched roofs. However, flat roofs and pitched roofs with sarking or insulation will require the installation of vents through the roof surfaces or at the eaves and ridges. Insulation material in roof spaces should be kept clear of external walls, gutter soles or timbers in contact with damp or potentially damp masonry

4.2.5 Windows

Windows should be refurbished so as to allow easy and convenient opening and closing by occupants in order to encourage proper ventilation of the building. This is important both for environmental and structural health. Windows should be fitted with security locks so as to allow secure locking in a partially opened position

4.3 STRUCTURAL DETAILING

4.3.1 New timbers

New timbers should be isolated from any damp or potentially damp masonry with a damp proof material or ventilated air gap

4.3.2 Timber repairs

Structurally decayed timbers should be removed or cut back to sound timber unless required for aesthetic reasons. Timbers should then be partnered or spliced and isolated as recommended in section 4.3.1 above. If steel plates or hangers are used, they should be detailed so as to allow sufficient ventilated air gaps and drainage to prevent moisture build-up due to condensation. No timber preservation or remedial treatments should be required

4.3.3 Paint finishes

Moisture vapour permeable or 'microporous' paint finishes should be preferred for internal and external surfaces and woodwork. This is especially important on window timbers. To take advantage of the properties of such paints, the complete removal of old alkyd paint systems is recommended. Health and Safety: Special precautions should be taken during surface preparation of pre-1960s' paint surfaces as they may contain harmful lead. (Permoglaze MVP System, produced by Akzo Nobel Decorative Coatings Ltd, is one example of a suitable opaque high build water-borne moisture vapour permeable paint system, consisting of an MVP primer undercoat and MVP acrylic gloss. There may be other similar products available)

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5 H+R WORK ON SITE

5.1 H+R inspected the structure visually for defects associated with damp and decay or liable to allow water penetration before and after refurbishment

5.2 H+R took samples from representative masonry masses, so as to determine their gravimetric and hygroscopic moisture content

6 PROPOSED ACTION BY H+R

6.1 H+R will advise on remedial detailing, so as to minimise the risk of damp and decay problems after refurbishment, if instructed

6.2 H+R will advise on conservation of original fabric with regard to damp, decay and salt damage, as necessary, if instructed

6.3 H+R will review proposed remedial details as these become available, if instructed

6.4 H+R will return to site to inspect sample remedial details, if instructed

6.5 H+R will liaise with conservation and historic building authorities, if instructed, so as to ensure the cost-effective conservation of original fabric, if instructed

7 INFORMATION REQUIRED BY H+R

7.1 H+R require copies of up-to-date copies of project programmes, as these become available

7.2 H+R require copies of up-to-date lists of project personnel and contact lists as these become available

7.3 H+R require copies of proposed remedial details for comment as these become available

7.4 H+R should be informed as a matter of urgency if further significant water penetration occurs onto site; so that advice can be given on cost-effective remedial measures, to minimise the risk of cost or programme overruns and so as to minimise the risk of damp or decay problems during the latent defect period

8 ADMINISTRATION REQUIREMENTS

8.1 H+R require formal instructions for further investigations and consultancy on this project

8.2 H+R require confirmation of distribution of digital and printed copies of reports and site notes

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Attachment A

Fig 1 :

Exterior, north elevation; showing a general view of the elevation

Fig 2 :

Exterior, north elevation; showing a general view of the roof coverings to the north pitch. These appeared to be of fired clay construction and were in good condition with no identified slipped, missing or broken tiles. However, the roof was covered with significant moss growth which in itself was not a source of damp but, when moss growth becomes dislodged it can block the roof drainage system causing damp penetration beneath

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Fig 3 :

Exterior, north elevation; showing a view of the chimneystack at the west end. The brickwork at the head of the chimney appeared to be pointed with a cementitious material and the base of the mortar joints had been washed out. This may be source of damp penetration into the interior. It was not clear if there were any cowls to the chimneystack preventing damp penetration into the interior

Fig 4 :

Exterior, north elevation; showing a view of extensive plant growth emanating from defective roof drainage systems above. The guttering appeared to be deformed and the downpipe appeared to be undersized for purpose, and was vulnerable to blockage due to blockage due to plant growth and moss growth above

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Fig 5 :

Exterior, north elevation; showing a view of defective guttering which had become deformed and was allowing water to cascade onto the base of the ground

Fig 6 :

Exterior, north elevation; showing a view of plant growth around the entrance porch. This was caused by defective roof drainage systems above encouraging water to drain onto the unmade ground beneath

H+R

Pest House
Photographs
27 November 2018
Not to scale

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Fig 7 :

Exterior, north elevation; showing a view of plant and ivy growth around defective roof drainage systems

Fig 8 :

Exterior, north elevation; showing a view of the wall construction to the north elevation. The ground floor level appeared to be of modern brickwork with the first-floor level being covered in clay tiles. A number of these tiles were loose which may be allowing wind driven rain into the structure

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Fig 9 :

Exterior, north elevation; showing a view of a slate dpc which was seen to run along the north elevation. This was approximately 2 no. brick courses above the level of the external ground. However, rising ground levels towards the east left it vulnerable to being bridged if ground levels were not reduced

Fig 10 :

Exterior, north elevation; showing a view of significant moss growth cleared at the time of the survey to reveal hardstanding coverings at the base of the wall. These appeared to fall towards the north, encouraging water to drain away from the structure. However, the floor/wall junction appeared to be defective and may be allowing water to drain into the foundations

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Fig 11 :

Exterior, north elevation; showing a view of roof coverings to the porch. The porch appeared to be deformed indicating movement to its structural elements. This was unsurprising due to heavy plant growth which indicated damp conditions and also additional weight for the porch to support. Note also gaps between the vertical tiles and porch tiles which may be allowing wind driven rain to penetrate into the structure

Fig 12 :

Exterior, north elevation; showing a view of a bitumen felt dpc which was serving the west end of the north elevation. This was approximately 2 no. brick course above the level of the external ground

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Fig 13 :

Exterior, north elevation; showing a view of a blocked surface drain serving a downpipe

Fig 14 :

Exterior, north elevation; showing a general view along the front of the north elevation showing heavy plant growth indicating chronically damp conditions

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Fig 15 :

Exterior, east elevation; showing a general view of the elevation

Fig 16 :

Exterior, east elevation; showing a view of vertical tiles to the first-floor level. These appeared to be in fair condition. However, detailing around the edges of the gable had not been weatherproofed, which may be allowing wind driven rain into the structure

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Fig 17 :

Exterior, east elevation; showing a view along the ground floor level of the east elevation. This was constructed in a similar way to the north elevation with modern brickwork. The damp-proof course also extended along this elevation, although rising ground levels had left the dpc bridged in some areas

Fig 18 :

Exterior, east elevation; showing a view of the elevation from the south. note the presence of significant plant growth which may be affecting the foundations due to the root systems

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Fig 19 :

Exterior, east elevation; showing a view of very heavy plant growth to the entire ground floor extension at the south. This structure was due for demolition as part of the ongoing refurbishment programme. However, root systems and damp already in the structure may affect the masonry that is to be retained

Fig 20 :

Exterior, south elevation; showing a general view of the east end of the elevation

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Fig 21 :

Exterior, south elevation; showing a view of the roof coverings to the south pitch. These were similar construction to that of the north pitch and the condition was also similar but with less moss growth to the surface of the tile

Fig 22 :

Exterior, south elevation; showing a view of defective roof tiles at the bottom east corner of the pitch. This would be providing a path for wind driven rain into the structure. Note also that there were no roof drainage systems in this area meaning any rainwater from the roof was being directed onto the ground beneath

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Fig 23 :

Exterior, south elevation; showing a view of windows at first floor level. Flashing and tiles in this area were poorly detailed and would likely be allowing water into the structure

Fig 24 :

Exterior, south elevation; showing a view of the dpc which had extended around to the south elevation. This was approximately 1 no. brick course above the level of the ground, although ground levels appeared to be rising and they may be bridged in places

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Fig 25 :

Exterior, south elevation; showing a view along the ground floor extension at the south. The wall appeared to be in poor condition showing evidence of damp penetration. However, it was understood by H+R that this entire ground floor extension was due for demolition

Fig 26 :

Exterior, south elevation; showing a view of the join between the original structure and more modern extension to the west. The join to the roofs was in poor condition with open joints to the mortar, likely to be allowing damp penetration into the structure

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Fig 27 :

Exterior, south elevation; showing a close up view of defects described previously. Note also the defects to the mortar around the base of the chimneystack which would also be allowing damp penetration into the structure

Fig 28 :

Exterior, south elevation; showing a view along the eaves of the main structure. There was no guttering system to this roof which drained water directly onto the flat roof structure of the ground floor extension

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Fig 29 :

Exterior, west elevation; showing a general view of the west elevation to the main structure

Fig 30 :

Exterior, west elevation; showing a general view of the west elevation to the ground floor extension

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Fig 31 :

Exterior, west elevation; showing a view along the base of the catslide roof. There was no guttering to this area meaning water was cascading onto the ground beneath. Note also the presence of holes between the wall and the roof coverings allowing wind driven rain to enter the structure. There appeared to be movement in this area with cracks forming in some of the brickwork

Fig 32 :

Exterior, west elevation; showing a view of plant and algae growth along the base of the wall indicating chronically damp conditions. This was unsurprising due to the lack of roof drainage systems above

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Fig 33 :

Exterior, west elevation; showing a view along the base of the wall of the extension. The masonry here was significantly damp which had led to timber decay of the door. However, this structure was due for demolition as part of the refurbishment programme

Fig 34 :

Exterior, west elevation; showing a close-up view of the base of the wall. The dpc seen to the other 3 no. elevations was not visible to this elevation. However, there may be one installed but had been covered by ground levels at the exterior

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Fig 35 :

Interior, roof; showing a general view of the roof structure. The underside of the roof coverings appeared to be bitumen felt which was likely to be past its useful service life. However, generally there were no signs of significant damp penetration to the roof structure

Fig 36 :

Interior, roof; showing a view of a window service the roof structure. Glazing was broken in this area which would be allowing wind driven rain into the structure; although it would also be allowing ventilation which would encourage drying of any damp structures and reduce the risk of condensation during periods of inoccupancy

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Fig 37 :

Interior, first floor; showing a general view of the master bedroom. The walls were constructed from a timber frame with infill panels. The panels were not in contact with solid material and could therefore not be sampled for masonry sample analysis

Fig 38 :

Interior, first floor; showing a view of peeling wallpaper suggesting previous or currently damp conditions. However, generally the master bedroom was free from signs of significant damp penetration and damp in this area was likely to be caused by condensation due to inadequate ventilation on periods of inoccupancy

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Fig 39 :

Interior, first floor; showing a view of a fireplace at the west end of the bedroom. There was an accumulatio of debris around the hearth indicating blockages above

Fig 40 :

Interior, first floor; showing a view of the single window serving the bedroom. The view from the window was generally obscured by plant growth. This suggested damp conditions at the base of the walls encouraging plant growth to flourish

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Fig 41 :

Interior, first floor; showing a general view of bedroom no. 3. This was generally free from signs of damp penetration and was constructed in a similar way described previously

Fig 42 :

Interior, first floor; showing a general view of the landing area. This was free from signs of significant damp penetration. However, the window with broken glazing described previously was above this area which may have been allowing water ingress in the past, as well as ongoing

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Fig 43 :

Interior, ground floor; showing a general view of bedroom no. 2. The walls were generally dry lined on the north and south elevations; however, the wall at the end of the building was hard plaster. There was evidence of timber decay to the floor and timbers at the base of the wall indicating previous or current damp penetration

Fig 44 :

Interior, ground floor; showing a view of timber decay to the floor structure described previously

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Fig 45 :

Interior, ground floor; showing a view towards the north beneath the staircase. There was evidence of mould growth which indicated condensation which was unsurprising due to the periods of inoccupancy of the building

Fig 46 :

Interior, ground floor; showing a view of mould growth to the door of bedroom no 2

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Fig 47 :

Interior, ground floor; showing a general view of the lounge. The internal faces of the walls appeared to be faux timber framing with infill panels. Generally, the room was free from signs of significant damp penetration, although suffered from condensation and mould build-up due to reasons described previously

Fig 48 :

Interior, ground floor; showing a view of a fireplace serving the lounge. As with the fireplace described on the first floor, debris had fallen from within the flue indicating blockages above

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Fig 49 :

Interior, ground floor; showing a general view of the north end of the lounge. Generally, there was no signs of significant damp penetration around the edges of the door

Fig 50 :

Interior, ground floor; showing a view over the threshold of the front door. The external ground levels were close to that of the internal floor, leaving any timbers to the ground floor vulnerable to damp penetration and possible decay

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Fig 51 :

Interior, ground floor; showing a general view of the kitchen area. The walls were dry lined which prevented the extraction of masonry samples. However, generally the room appeared to be free from evidence of significant damp penetration at the time of the survey

Fig 52 :

Interior, ground floor; showing a view of the north wall to the kitchen. There was significant plant growth at the exterior of the property which can be seen growing through the window opening. This indicated moisture reservoirs at the exterior, which may be affecting the timber floor to the kitchen

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Fig 53 :

Interior, ground floor; showing a view of the south wall to the kitchen. Generally, this area was free from any signs of significant damp penetration

Fig 54 :

Interior, ground floor; showing a view of the ceiling of the kitchen. The presence of mould growth here indicated condensation due to inadequate heating and ventilation during periods of inoccupancy

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Fig 55 :

Interior, ground floor; showing a view within the area to the south which was due to be demolished as part of the ongoing refurbishment project. There was evidence of significant damp penetration in this area which may be affecting areas that are to be retained from the original building

Fig 56 :

Interior, ground floor; showing a view of significant damp penetration and mould growth to the base of the wall within the area to be demolished

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Fig 57 :

Interior, ground floor; showing a view of the solid floor structure to the structure due for demolition

Fig 58 :

Interior, ground floor; showing a view of the solid floor structure to the structure due for demolition

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Fig 59 :

Interior, ground floor; showing a close-up view of the solid floor structure to the structure due for demolition

Fig 60 :

Interior, ground floor; showing a close-up view of the solid floor structure to the structure due for demolition. The floor make-up appeared to be of at least three layers of concrete. However, access was limited so detailed inspection was not possible

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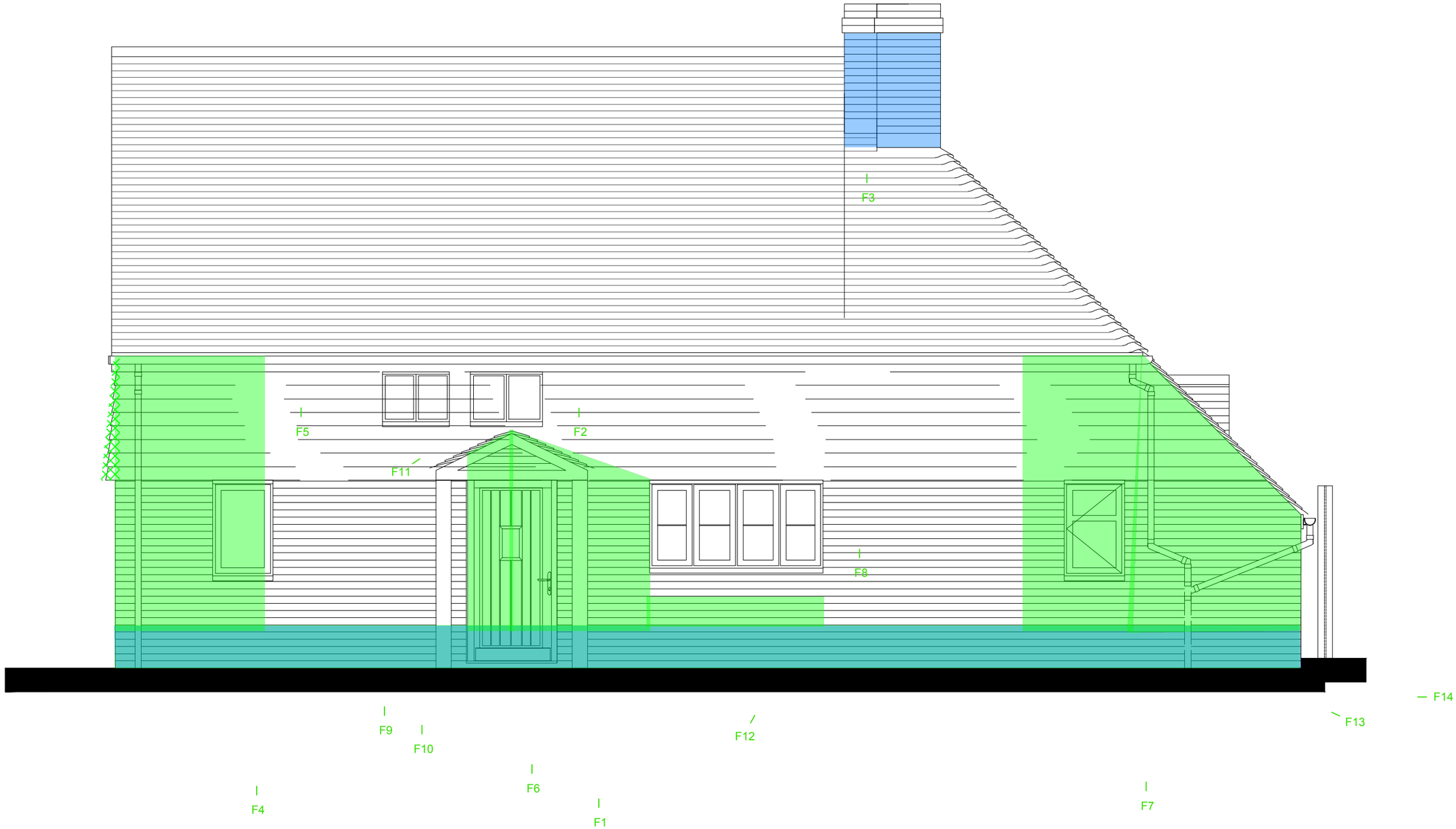
Attachment B



The Pest House, North Elevation
Damp investigation
27 November 2018

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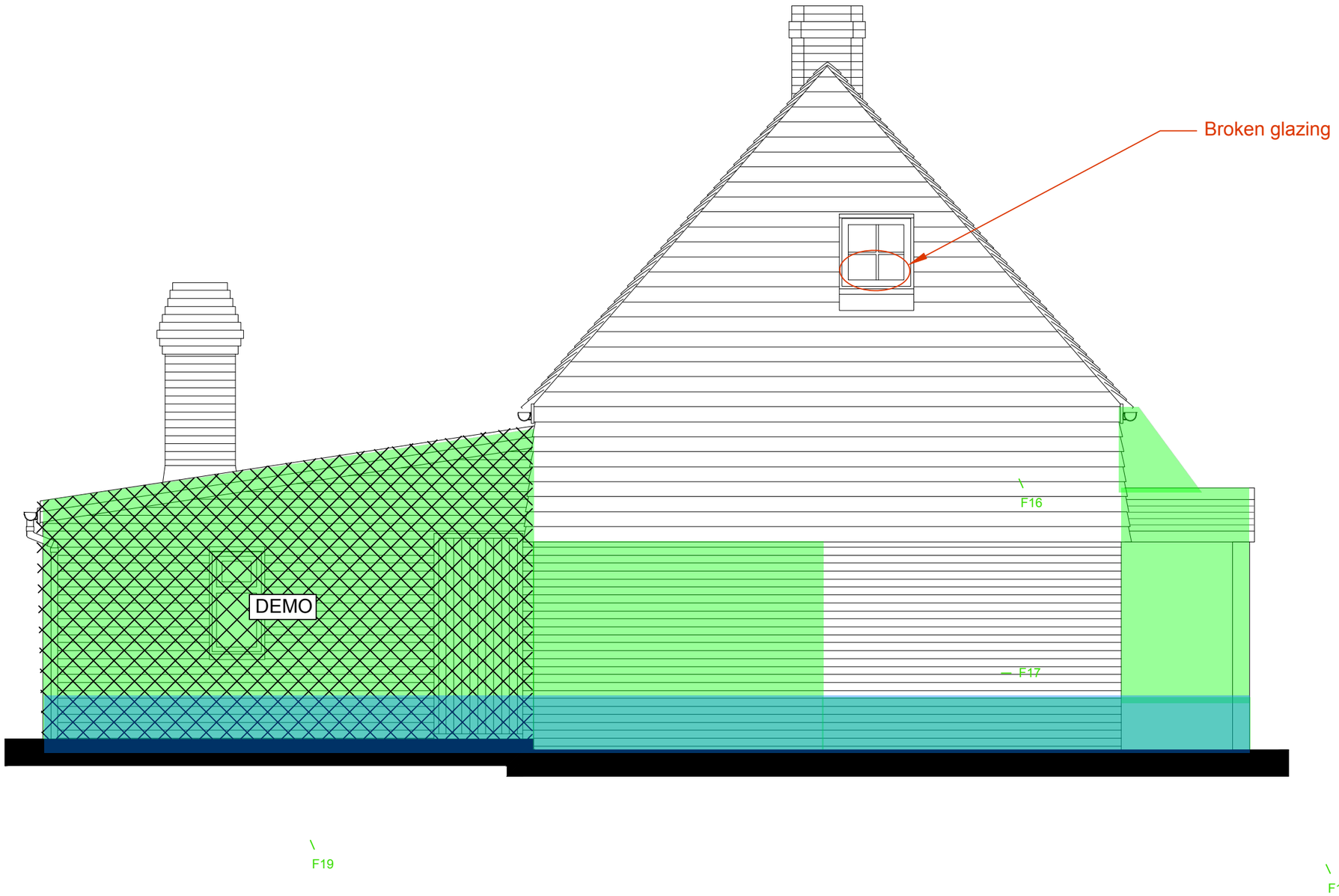
Area subject to water penetration providing the conditions for damp and decay
Plant growth
F Photograph location



The Pest House, East Elevation
Damp investigation
27 November 2018

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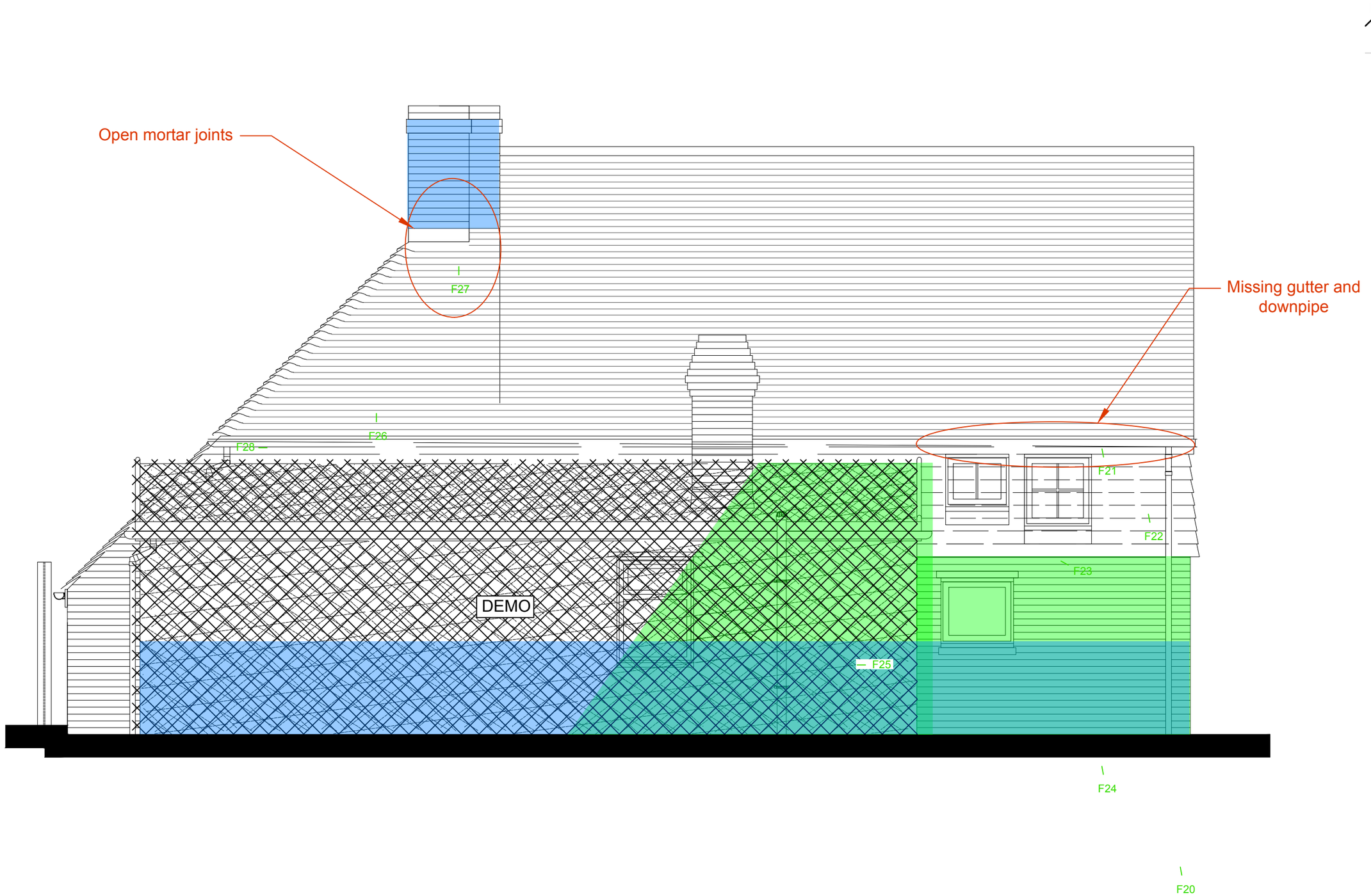
Area subject to water penetration providing the conditions for damp and decay
Plant growth
F Photograph location



The Pest House, South Elevation
Damp investigation
27 November 2018

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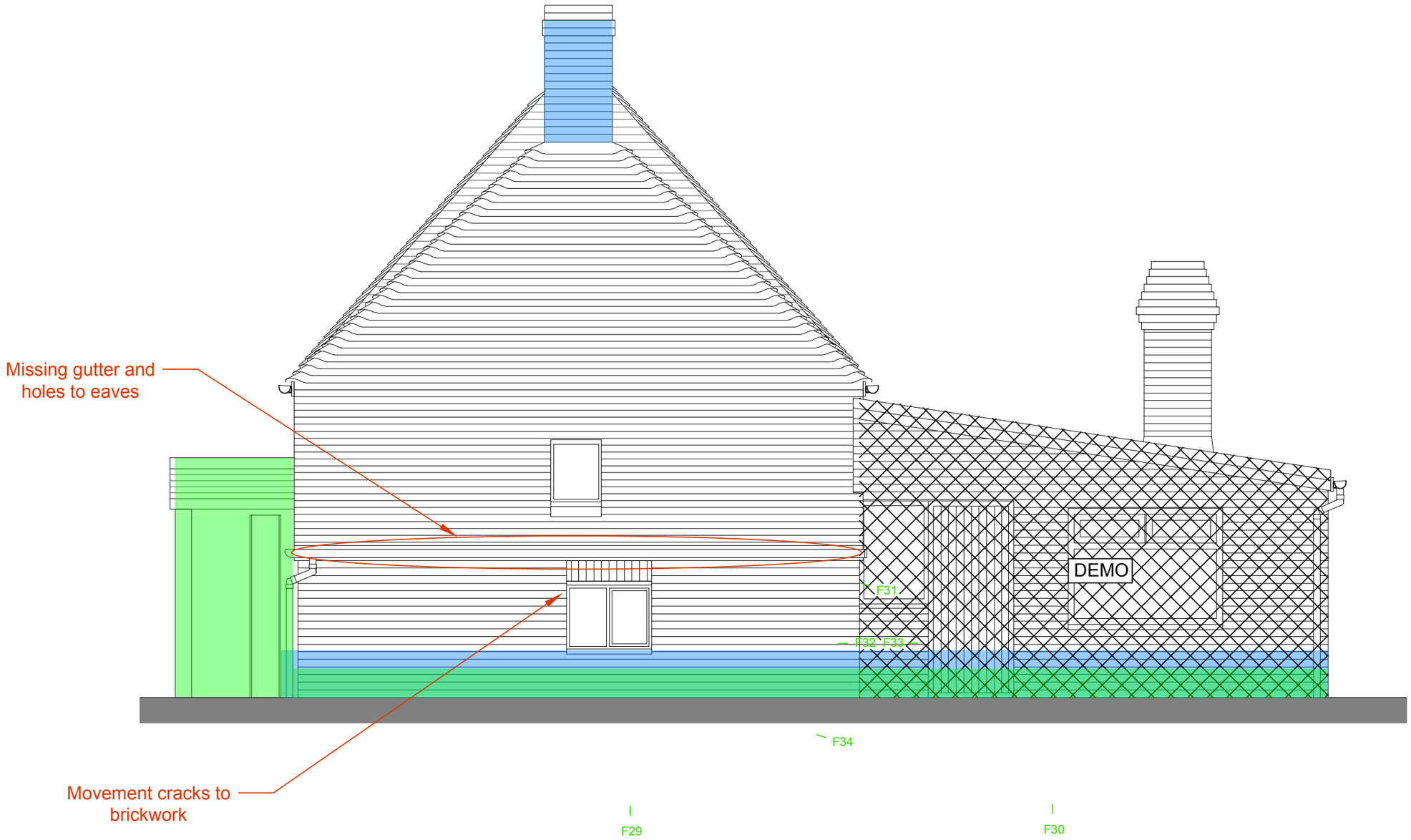
Area subject to water penetration providing the conditions for damp and decay
Plant growth
F Photograph location



The Pest House, West Elevation
Damp investigation
27 November 2018

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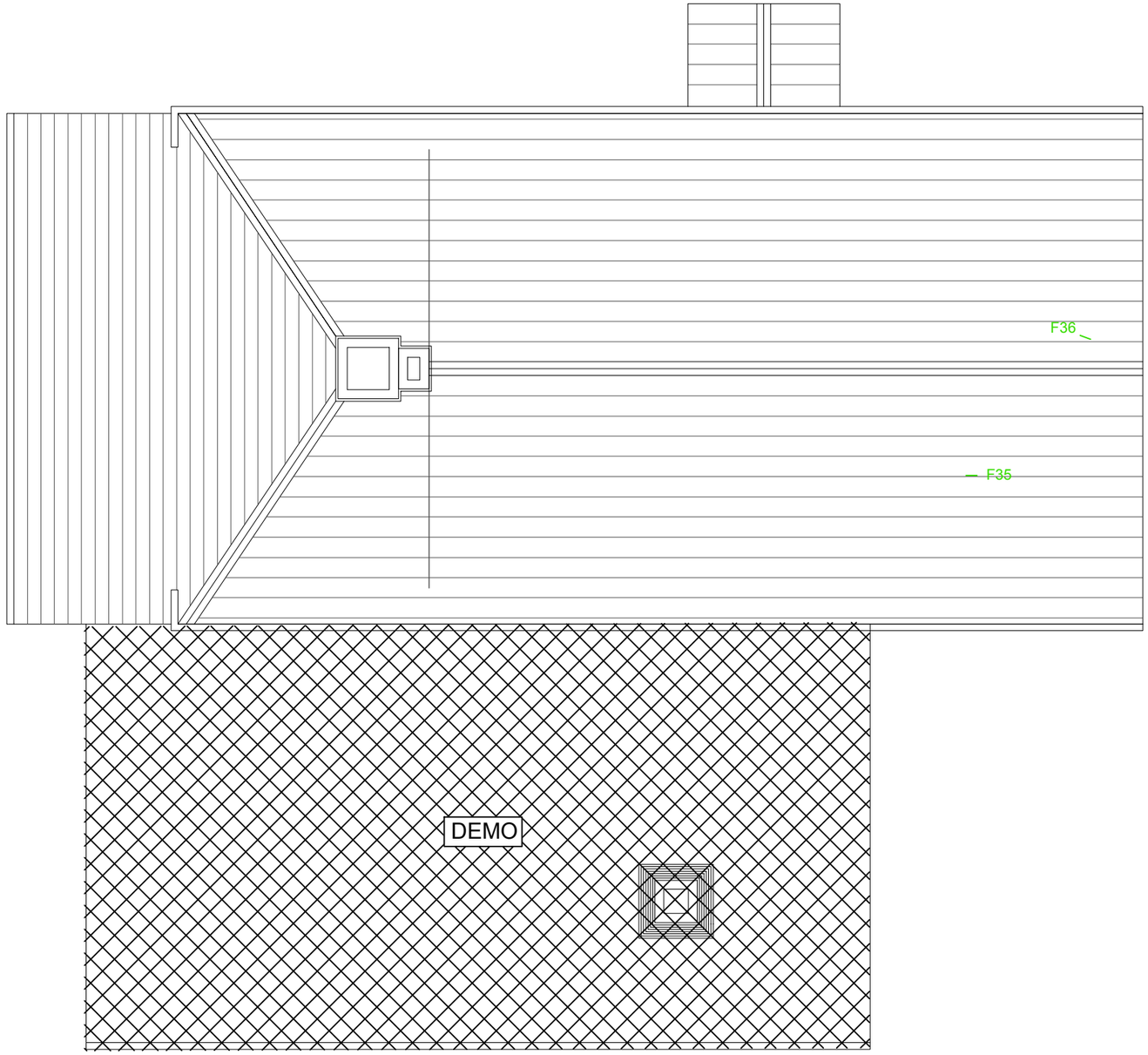
Area subject to water penetration providing the conditions for damp and decay
Plant growth
F Photograph location



The Pest House, Roof
Damp investigation
27 November 2018

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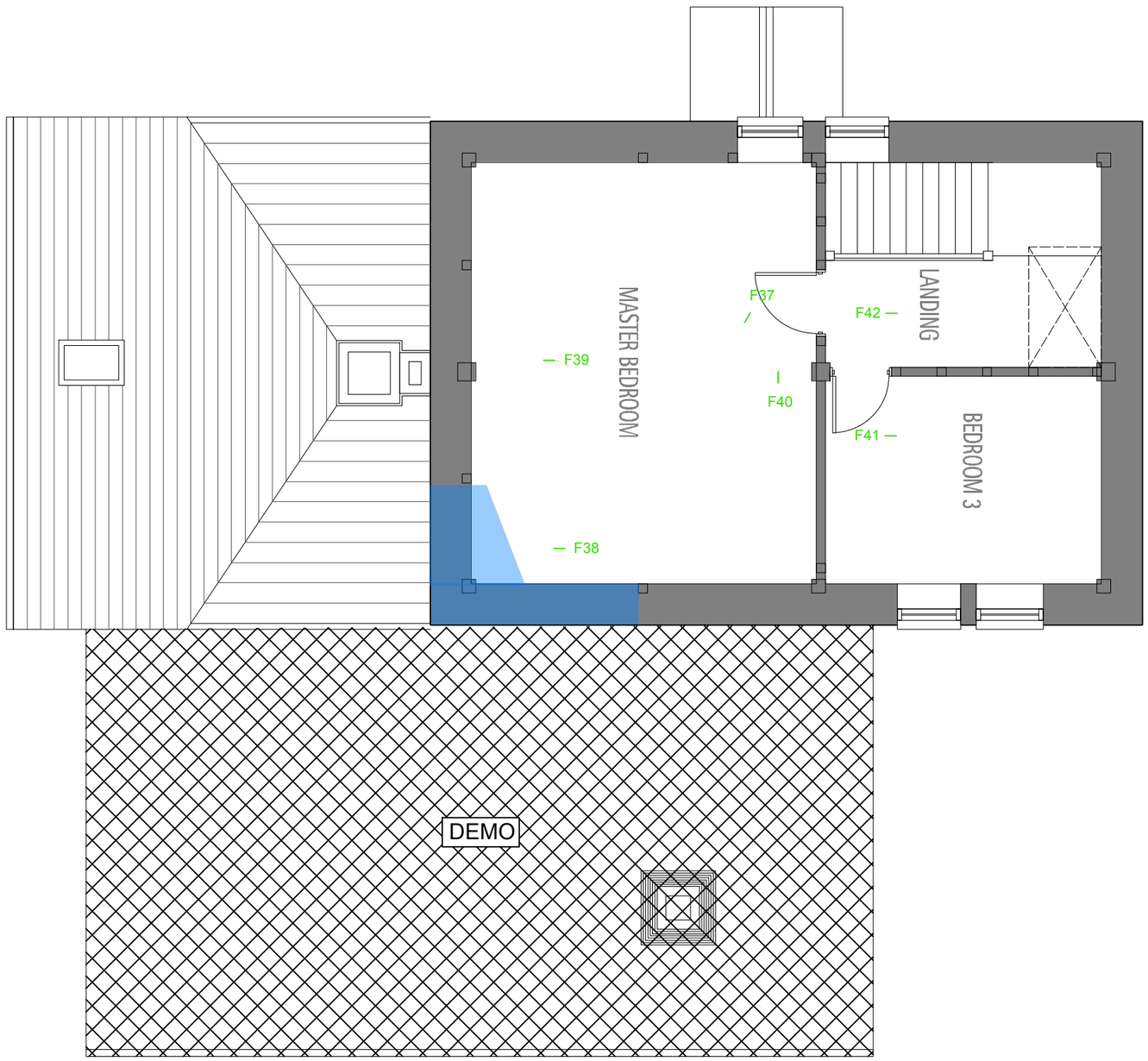
Area subject to water penetration providing the conditions for damp and decay
Plant growth
F Photograph location



The Pest House, 1st Floor
Damp investigation
27 November 2018

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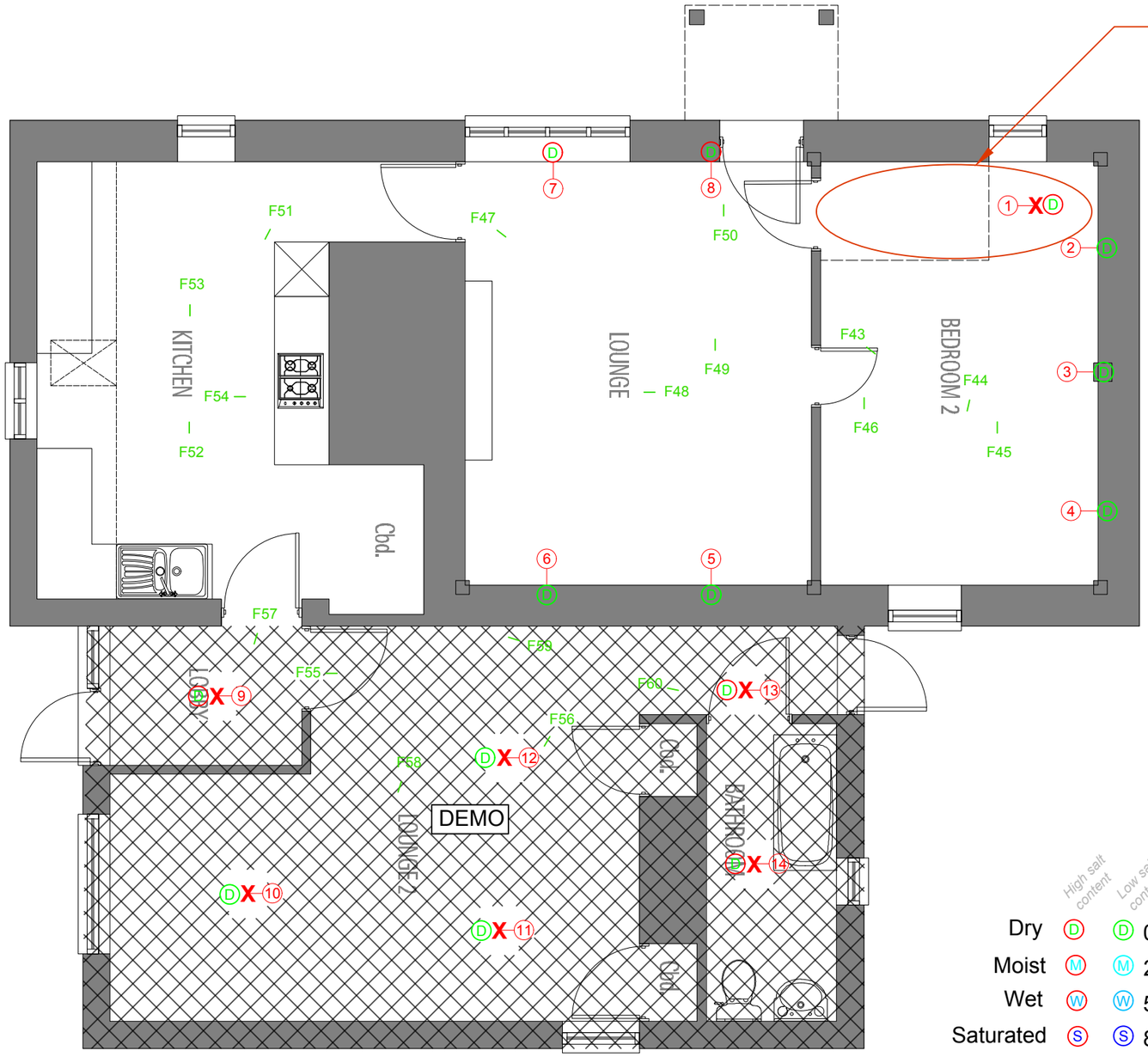
Area subject to water penetration providing the conditions for damp and decay
Plant growth
— F Photograph location



	High salt content	Low salt content
Dry	D	0-2% w/w available moisture content
Moist	M	2-5% w/w available moisture content
Wet	W	5-8% w/w available moisture content
Saturated	S	8+% w/w available moisture content
Super Saturated	SS	20+% w/w available moisture content

1 Masonry sample location

X 1 Masonry sample location taken from floor

The Pest House, Ground Floor
Damp investigation
27 November 2018

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Area subject to water penetration providing the conditions for damp and decay

Plant growth

F Photograph location

Attachment C

Table of material moisture contents **Attachment C**

Samples of masonry were drilled from walls and floor in areas vulnerable to damp penetration. The samples were placed in sealed containers and tested at the H+R laboratory in accordance with the procedure for gravimetric measurement of moisture content as described in the appendix to BRE Digest 245

Sample Number/Location	Moisture content % w/w			Hygroscopic moisture content % w/w	Available moisture content % w/w
1	7.26	D	H	6.06	1.20
2	2.09	D		1.88	0.20
3	1.95	D		1.58	0.37
4	1.56	D		1.47	0.10
5	2.30	D		1.99	0.31
6	2.18	D		1.88	0.30
7	3.75	D	H	2.92	0.83
8	3.76	D	H	2.35	1.41
9	3.39	D	H	3.44	-0.04
10	1.53	D		1.67	-0.14
11	1.43	D		1.31	0.11
12	1.19	D		0.98	0.21
13	2.68	D	H	2.45	0.22
14	4.87	D	H	4.01	0.86

Hygroscopic moisture is the ‘air dry’ moisture content of the sample at 75 per cent relative humidity. High levels above, say, 2 per cent are attributable to salt contamination. Hygroscopic salt commonly accumulates in old plaster and masonry that has been subject to dampness penetrating from the ground over many years. High levels above, say, 3 per cent of available moisture (liquid water) in the sample indicate continuing dampness due to liquid water in the sample usually resulting from faulty rainwater and plumbing goods

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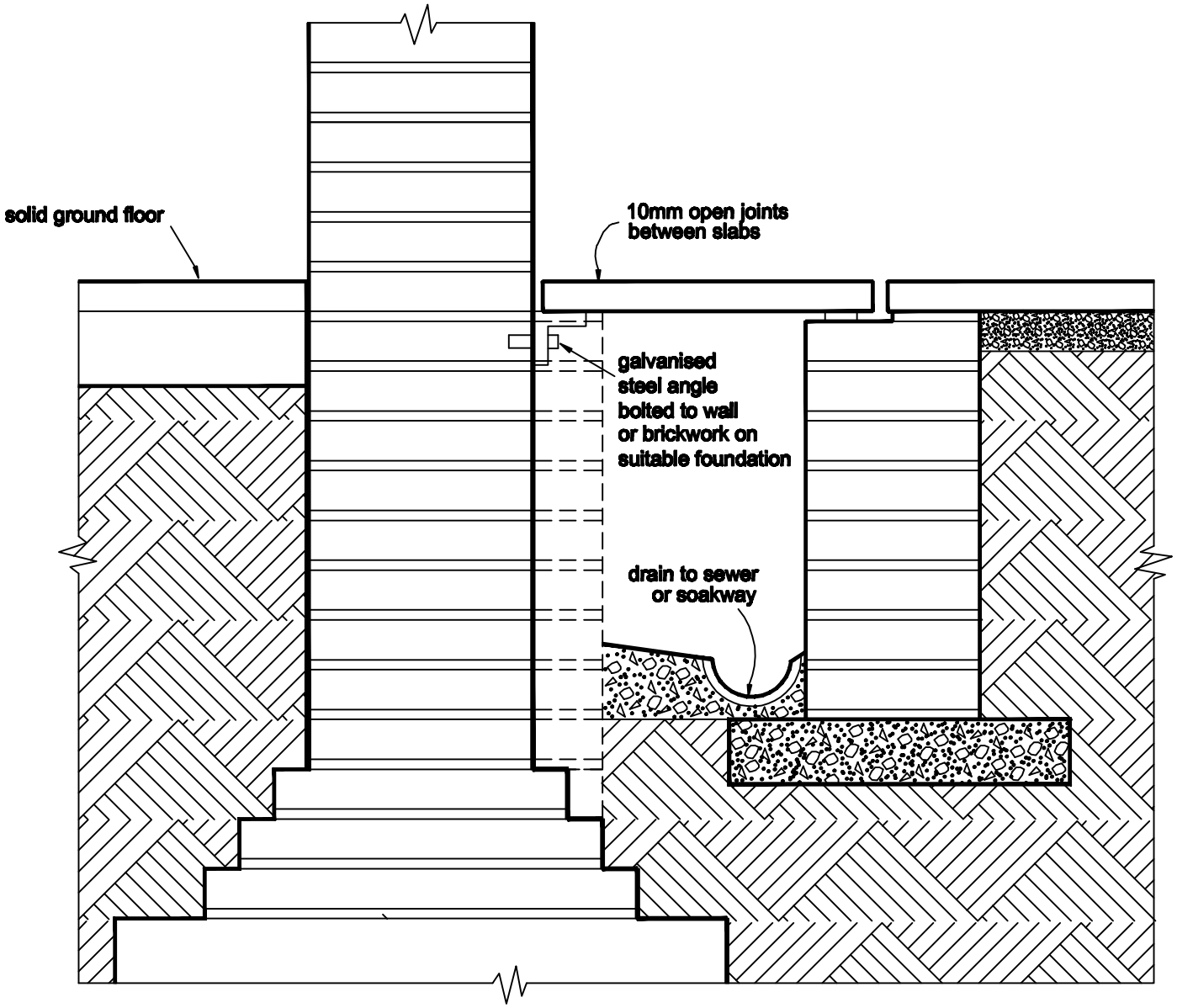
Attachment D



Raised external ground levels

Air Drain - Typical Section Detail

November 2007

Not to scale

NOT TO SCALE

SD-13

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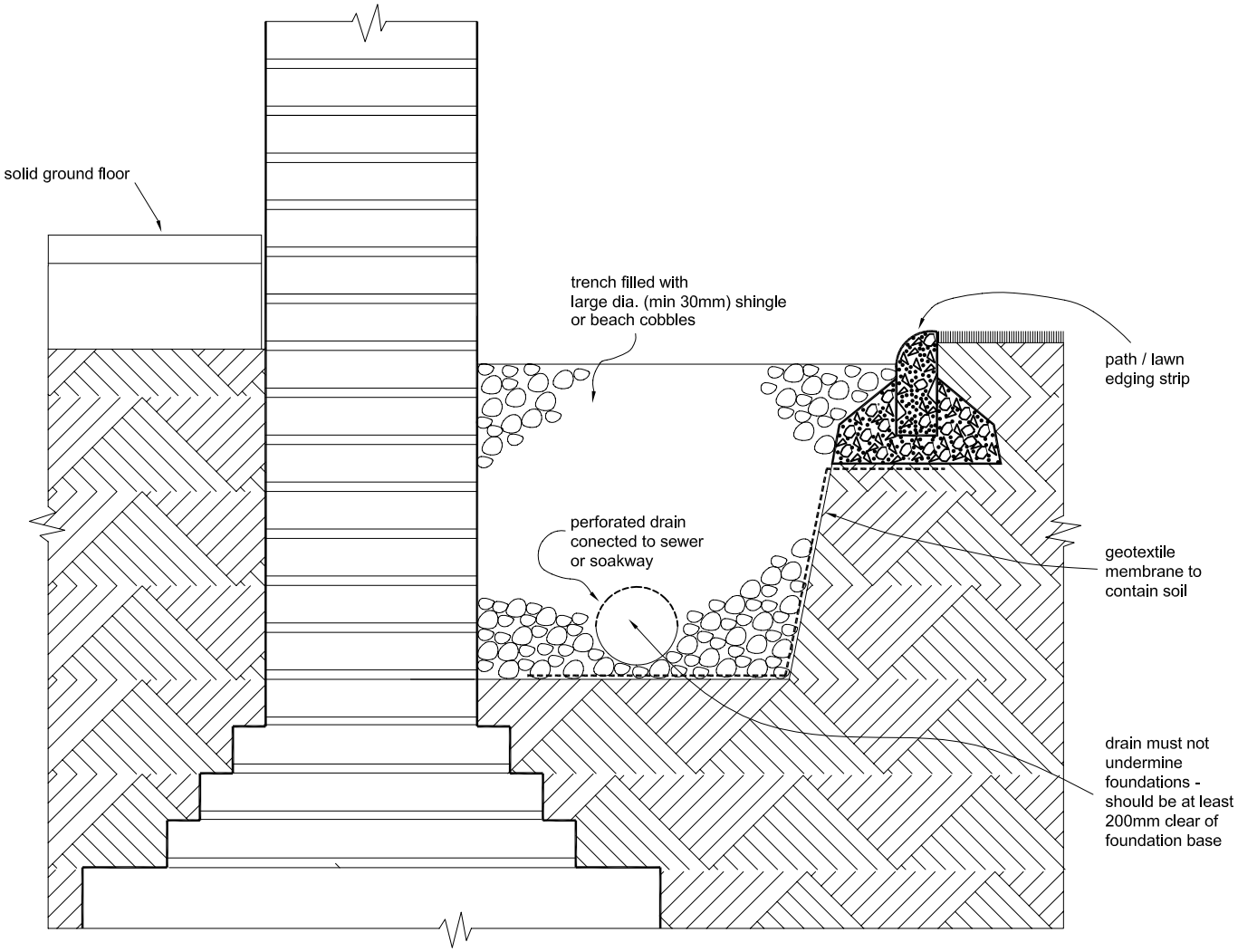
Tel: 01483 203221 Fax: 01483 202911 Standard detail - air_drain_211102.dwg



French drain

Typical ground drainage detail that may be adapted for use

July 2009

Not to scale

NOT TO SCALE

SD-37

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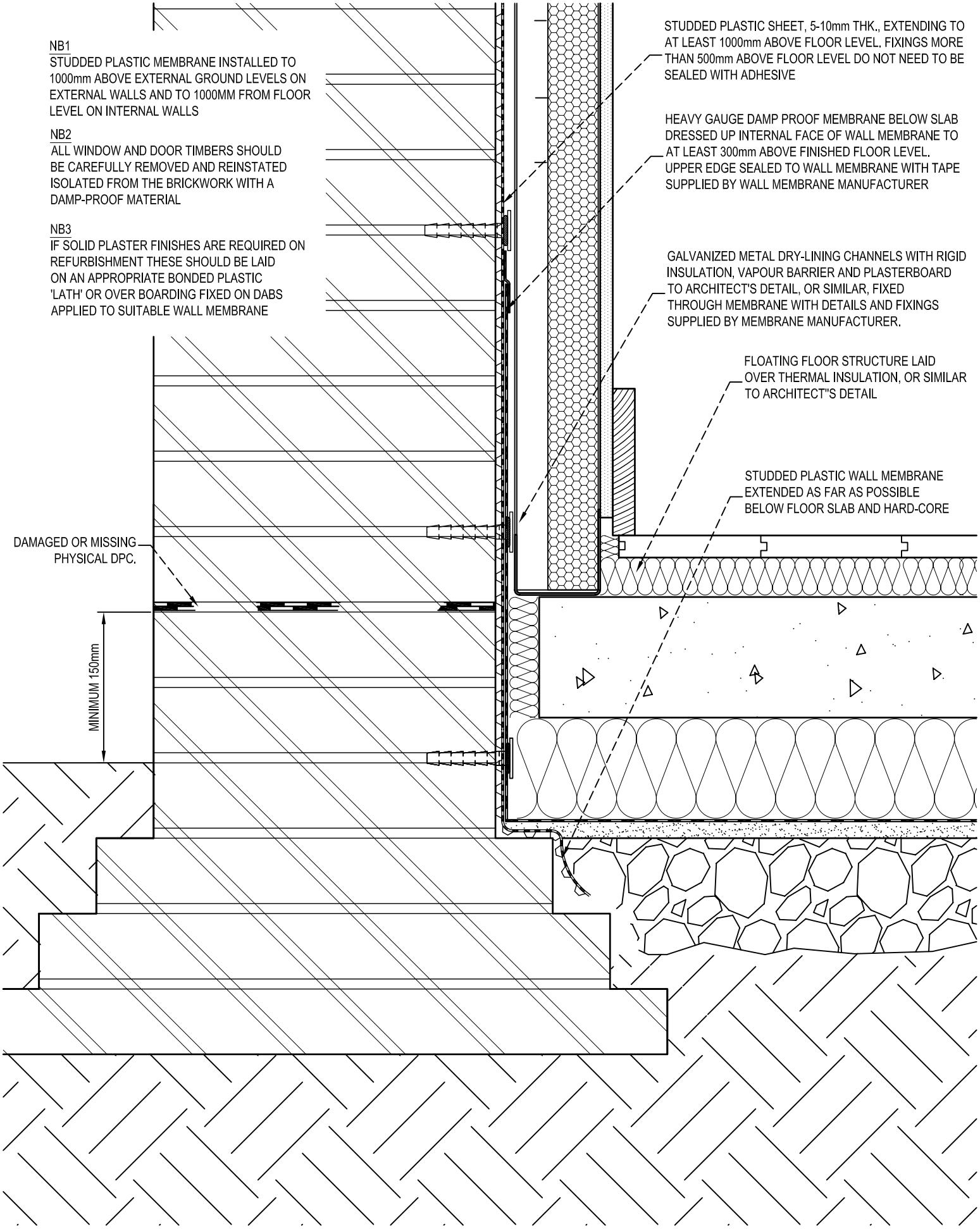

H+R

Vertical Damp-proof Membrane for Ground Floor Walls

Solid Floor (new) with Free Draining Ground, no wall DPC

Section - June 2010 - Indicative Only - Not for Construction

NOT TO SCALE

SD-42A

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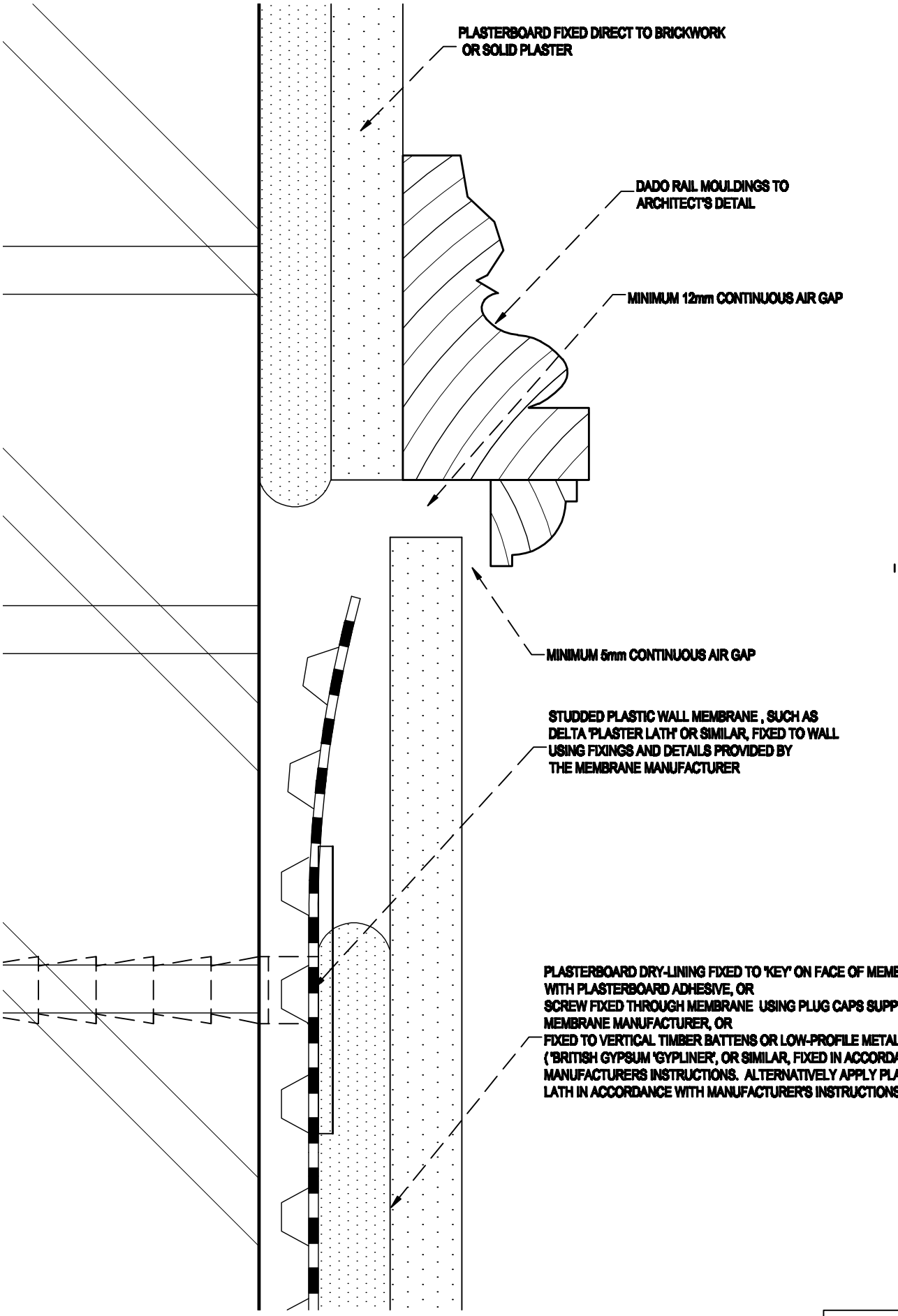

H+R

Ventilated Dry Lining

Dado rail detail to vent behind studded plastic wall membrane

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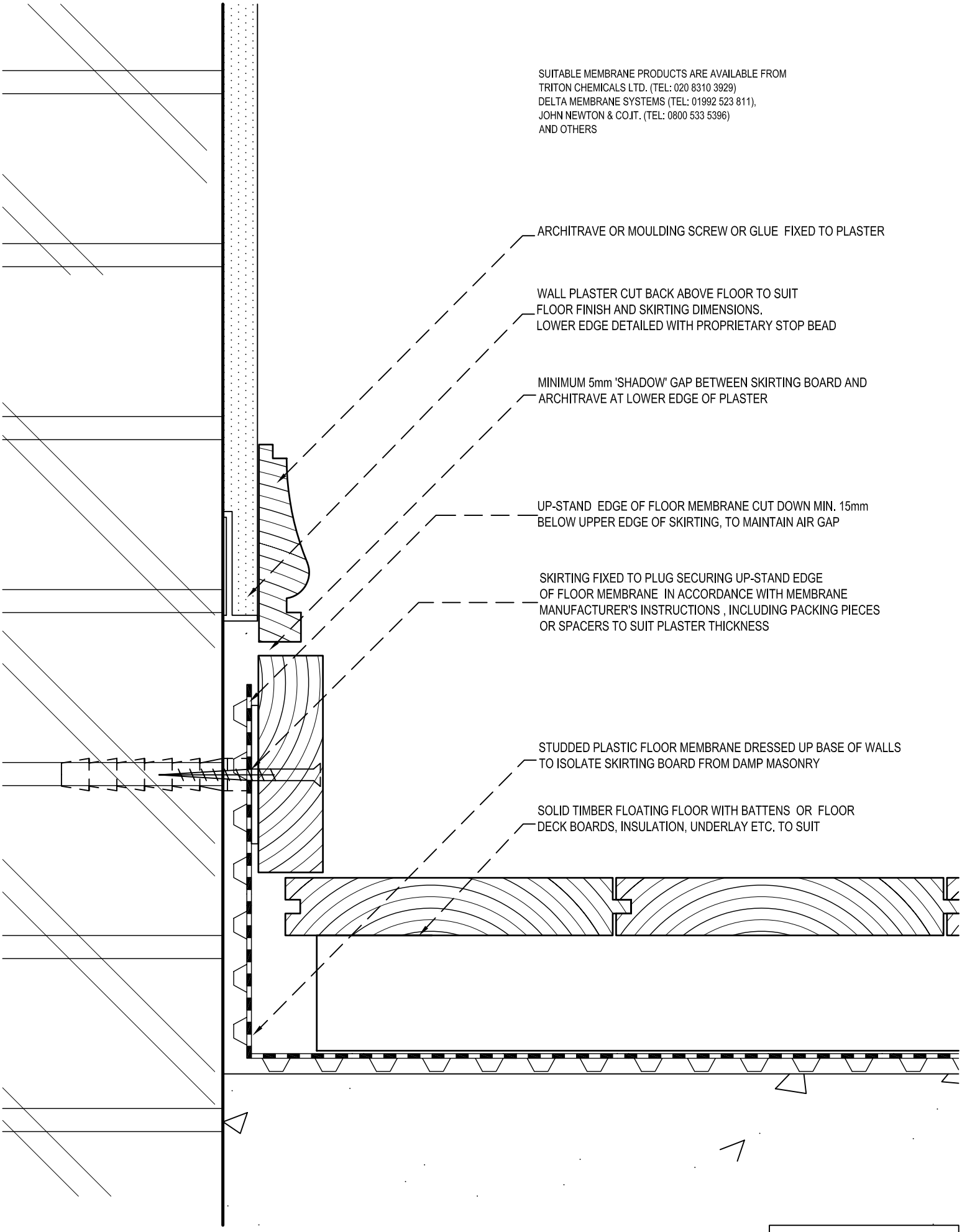

H+R

Ventilated Dry Lining

Ventilated skirting detail, with 'floating' timber floor laid over studded plastic floor membrane

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