The Church of St Mary

Thornthwaite cum Braithwaite, Cumbria, CA12 4QD.

Diocese of Carlisle

CONDITION SURVEY 2016

Prepared on behalf of the Parochial Church Council

by

Peter Kempsey Dip Arch AABC and Ian Wells B Arch RIBA

Countryside Consultants, Townhead, Alston, Cumbria CA9 3SL

Tel: 01434 381906 E mail: info@countryside-consultants.co.uk

Summary of Report Headings

1.0 General Information

1.01	Name of Church and Archdeaconry	The Church of Saint Mary, Thornthwaite cum Braithwaite, Cumbria. CA12 4QD Diocese of Carlisle Deanery of Derwent Archdeacon The Venerable Kevin Roberts 2 The Abbey, Carlisle Cumbria, CA3 8TZ Tel 01228 523026 mob: 07584 684300 archdeacon.north@carlislediocese.org.uk
1.02	Name of Advisers	Peter Kempsey Dip Arch AABC and Ian Wells B Arch RIBA
1.03	Address, Telephone Number and E-Mail Address of Adviser	Countryside Consultants Townhead, Alston, Cumbria, CA9 3SL Tel 01434 381906 E mail ian@countryside-consultants.co.uk
1.04	Date of Inspection and previous inspection	A quinquennial inspection was carried out in September 2011 by Cummins Day. This report results from a visit made on the 12th January 2016.
1.05	Weather on day of inspection	Wet and cold and following the recent flooding. Some light rain.
1.06	Brief description of the building	Origins date to around 1240 when a small chapel of ease was built. The existing church of local Skiddaw slate was rebuilt in 1832 and enlarged in 1853. This added transepts, west end extension and bellcote. Enlargement work by G Watson under Salvin. Substantial repairs were completed in 1993. Further description from the listing: Split slate rubble with angle buttresses, under graduated green slate roof with coped gables and kneelers. 2-bay nave with west gabled porch, and open west bellcote; transepts; single-bay chancel with north vestry. Nave has lancet windows and triple lancet west windows; paired lancets in transepts. Chancel has tripartite east window. Interior has open timber roof, common to nave, chancel and transepts.

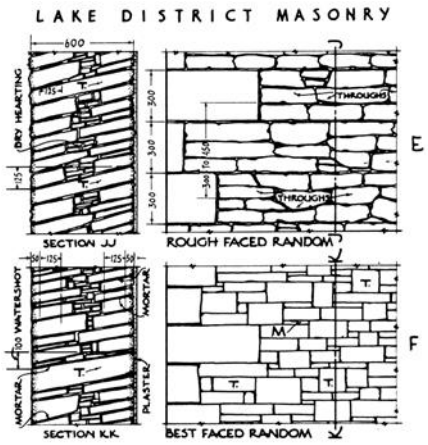
1.07	General condition of the building	See previous quinquennial report.
1.08	Safety aspects of the building	See previous quinquennial report.
1.09	Is the Church Listed and/or in a Conservation Area?	Saint Mary is listed Grade II. All works which involve any change require listed building consent. 'Like for like' repairs do not require listed building consent. Consult the Diocesan Office and Local Authority before carrying out any works.
1.10	Specific limitations of the report	The inspection was carried out with the assistance of Stephen Gebbels of SG Building Services. He was able to open up the floor and roof. Gullies were cleaned out and checked. An external trial pit was dug. The roof was inspected from ladders. Plaster samples were taken.
1.11	Schedule of Works completed since the previous report	Two pitches of the roof have been lifted and re-laid. Two flood gates have been added to the church yard wall. The hips to the vestry have been replaced with clay hip tiles.
1.12	Work Outstanding from previous report	Electrical Testing Lightning Protection Testing
1.13	Log Book	A log book recording repairs etc. undertaken at this church was not available. However when we attended site for this inspection a collection of documents was made available to us. Given the volume of these documents to study a revised quotation to review and summarise this archive was submitted to the church and subsequently accepted. Please see Appendix 1: Historic Documentation Report.

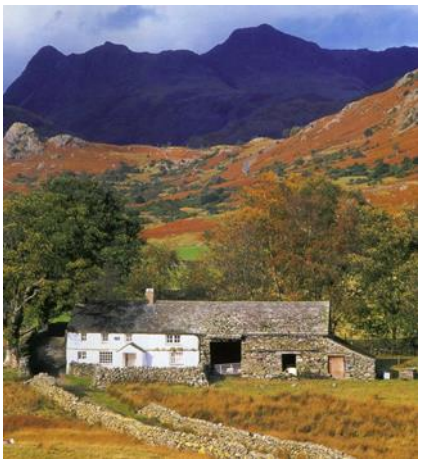
1.14 Introduction to the report

Countryside Consultants have been asked by the PCC to report on the condition of the church. The church is suffering from water ingress and this is leading to a very humid environment within the church resulting in condensation. Internally the areas of the floors are regularly damp and the wall plaster is damaged and disfigured in many places.

THE CHURCH WAS BUILT IN A LOCAL VERNACULAR STYLE

From the documentary evidence it is clear that the building was originally built in a very traditional local vernacular style. Locally there are three types of stone available for building. The very best slate available is that formed from even layers of mudstone. These are the stones that split well to form slates for roofing. The second quality stone is consistently grained but not quite good enough to make roofing slate but it is good enough to make external walls. This splits sufficiently consistently to allow the masons to lay them at a shallow angle so the mortar beds slope out so that they shed the water to the outer face of the wall and keep the interior of the wall dry.





Second quality slate is used for 'water shedding' external walls and third quality slate is often lime rendered for weather resistance.

The third quality stone is rather variable in character and is not classed as a pure slate, often it has the characteristics of a sandstone. Traditionally this type of stone was laid randomly in lime mortar. As this construction was not as resistant to rain as the types previously described, it was usually rendered with lime harling to allow it to resist the weather. The picture above shows a typical farm steading from the Lake District. Both buildings are built of this third class of stone but the farmhouse is given added protection by the addition of a lime render finish.

THE CHURCH ROOF

The roof weathering of local Westmorland grey green slate was laid over sarking boards on battens and bedded in harled lime plaster.

THE CHURCH WALLS

The walls are built from what is described above as the third quality local stone. We know from the documents provided by the church that the stonework was laid and pointed with lime mortar, the outer faces also protected by a coating of lime harling. The harling would have been regularly refinished with lime wash to give further protection. The inner face of the wall would have been finished in three coats of lime plaster. This complete construction would have provided a good weatherproof wall which would have been able to breathe. This allowed the wall to absorb moisture in wet periods and dry out though evaporation during dry periods.

By the middle of the 20th Century the lime harling would have been 100 years old and it is not surprising that it was at the end of its useful life and needed replacing. Rather than replacing it the harling was removed, the lime pointing scraped out and a hard cement and lime mortar was used to replace it.

In the 1960s the now exposed stonework was then treated with a water repellent coating of silicone. This would have made the face of the stonework rainwater tight in the short term but it also will have started to make resistance to the movement of moisture through the wall. Silicone waterproofing can also cause rainwater to stream down the wall face and penetrate any flaws in the pointing.

Shortly after the external work had been carried out the internal lime wall plaster started to fail. This was patched up with waterproof cement undercoats and salt sensitive finishing plasters. Again this work should have been carried out in lime based materials to match the original work.

THE FLOOR OF THE CHURCH

This was originally built by spreading a layer of coarse sand mixed with earth. This surface provided a very good bed for the wearing surface of red sandstone flags. This traditional construction provides no damp proof membrane so moisture passes through the flags which are quite porous into the building. When the walls were able to breathe and pass moisture though them this was not a problem. However this became a problem once the walls had been pointed in cement mortar externally and plastered in cement mortar internally. The walls could then no longer breathe to expel the moisture. From that point the moisture in the air was trapped in the church and is forced to condense on the new moisture resistant surfaces.

HUMIDITY AND HEATING IN THE CHURCH

It is usually the requirements of the organ which determine the ideal humidity conditions in a church. The relative humidity should not drop below 55% and should not be above 75%. Conditions are usually satisfactory if a heating system can be operated that keeps a minimum temperature in the church of 8 degrees centigrade. This heating would then be boosted for services and events to say 17 degrees.

The council report dated 1999 provided a useful and very clear presentation on the issue of heating and the control of humidity and condensation within church buildings. This report's key points are summarised in Appendix 1 and its conclusion is reproduced in Appendix 3.

2.0 Recommendations for Repair/Renovation

2.01 Initial repairs required this spring.

ALL ROOFS AND RAINWATER GOODS (gutters and pipes)
Employ a good local roofer to spend a day patch repairing the worst of the loose slates and poorly lapped slates in all the roof pitches apart from the pitches which were recently re-laid. All lead flashings etc. should also be checked and debris be removed from valleys. All cast iron rainwater goods to be cleaned and checked over. Broken sections to be replaced. The brackets are to be realigned and re-fixed as necessary.

PORCH ROOF
The cement flashings over the porch are to be removed. The associated soakers are to be checked over. A code 5 lead abutment flashing should be installed to replace the leaking cement flashing. A deep chase will be cut into the wall to take the flashing and make a seal. This new flashing will be sufficient to stop water running down the face of the south west gable and entering the porch. However if water is also running into the core of the wall further work will be required to divert this water from entering the porch. The extra work is described in section 2.05.

WC AND KITCHEN EXTENSION ROOF
Check the roof void and all flashings to see it this offers clues as to where the damp is entering the WC. Improving the roof void ventilation is likely to be necessary. Replace the cracked mock stone hips to the roofs with grey clay hips to match those recently fitted to the vestry.

If the above works do not stop the ingress of water then it is likely that the water is running into the extension from the core of the sanctuary wall. If this is the case a wall tray will need to be fitted into the wall.

PORCH VENTILATION
Currently the porch is a damp and airtight cell. The floor and wall below the west gable are very damp. Provide four 215 x 215 air bricks in the side walls of the porch to allow a good trickle of ventilation through the porch.

The inner porch door frame is rotting. Remove the door set, replace the frame with one made from treated timber and refix, isolating the frame from the stonework with Hyload damp proof membrane material.

BLACK MOULD STAINING
Apply a weak (10% or less) bleach solution to all plasterwork suffering from black mould. Do this once a month for 3 - 6 months. After this the mould should not re appear for several years.

CRACKS AND HOLES IN THE JOINTS OF THE EXISTING WALLS
A short term patch pointing exercise should be carried out to fill the worst of the missing mortar pointing to prevent water ingress. Particular attention should be made to the window perimeters. Both the joint between the glass and the dressed stones and the dressed stones and the random rubble walling need to be checked.

2.02 Longer term roof works

The re-laying of two roof pitches was carried out recently. The church would benefit from all the roofs being re-laid on new breathing sarking felt and treated timber battens.

2.03 Floor works

The floor, particularly the stone flagged floor in the nave is the major source of damp in the church. The introduction of a damp resistant membrane into the floor will make a big difference to the humidity levels in the church.

2.04	Heating system	New under floor heating could be connected to the existing boiler alternatively it could be connected to a new air source heat pump. However such modifications to the heating system would require the advice of a building services engineer.
2.05	West gable external wall face works	The south west gable is the dampest wall in the church. It faces the prevailing wind; it is tall and is not sheltered by a roof eave and gutter. It catches all the rain the Atlantic low pressure weather systems can throw at it. The photographs show that many small plants are growing in the mortar joints because it is constantly damp. This wall must have the greatest priority for external repointing. The use of a lime mortar will allow the wall to breathe out moisture during good periods of weather. This wall does not have the over window lead trays which have been fitted elsewhere. If the porch flashing proposed in 2.1 does not solve the ingress of water into the porch then a lead wall tray should be fitted across the core of the wall.
2.06	West gable internal wall face works	Most of the plaster on this wall has suffered from damp ingress and salts. It should be stripped off, allowed to dry out for several months and then re plastered. There are several options for re plastering methods which can be considered in detail at a later stage. These are listed in 2.08 below.
2.07	Masonry repointing to other elevations	Ideally all the walls of the church should be repointed. The most weather sensitive elevations should be tackled first. We group them in order of priority. • North west nave elevation, north west gable of the transept. • South west elevations of both transepts. • South east elevation of the nave and south east elevation of the sanctuary. • Remaining elevations of the transepts and sanctuary.
2.08	Internal wall face works	Much of the plaster on the walls has suffered from damp ingress and salts. It should be stripped off, allowed to dry out for several months and then re plastered. There are several options for re plastering methods which can be considered in detail at a later stage. • Traditional NHL 2 Lime plaster • Renovating plaster on a Sika 1 render (as used in 1993) • Renovating plaster on a cavity drain membrane Any use of materials which include gypsum (as used in 1968) must be avoided.
2.09	Internal paint finishes	All redecoration should be done using appropriate moisture permeable materials which will enable the walls to breathe.

3.0 External Elements

3.01 Roof coverings

EARLY C20th WORK
All the main roofs are weathered Westmorland grey green slate with traditional diminishing courses, the older pitches on timber sarking boards. Possibly overlaid with battens and lime render.

1990s PATCH REPAIR WORK
The repairs have been laid over an impervious bitumen and hessian sarking felt. There are signs and documentary evidence of major patching taking place. Remedial work has been done at the eaves of the north west nave wall to insert a new membrane drip to direct the runoff into the gutter. This is no longer satisfactory. The original red clay ridges are in poor visual condition but are serviceable.

The north west pitch of the nave was inspected by the builder from roof ladder. He found that some of the slates lapped poorly and the sarking felt was exposed in at least one place. This pitch was heavily patch repaired in 1993.

The south east pitch of the sanctuary is in poor condition. There are slipped slates and the lead valley gutter looks poorly laid and has debris in it.

NEW WORK
This has been carried out since the last quinquennial which was dated Sept 2011.
The south east pitch of the nave and the south west pitch of the south transept have been reroofed. This has been done with the original slates supplemented with matching salvaged material. New treated softwood battens and a breathing sarking felt have been used. The lead work at the valley gutters has been replaced in correctly set out lengths. The ridge tiles have been replaced in plain red clay with lapped joints. This work all conforms to current good practice and looks very satisfactory.

ENTRANCE PORCH
The roof looks in good condition and is easily accessed for repairs. However the abutment flashings to the south west nave gable wall do look poor. They have lead soakers which are over dressed with a mortar fillet. The fillet has a segment profile and is cracked in many places. The old sandstone lintel over the door into the nave is very wet and this could be a sign of water in the core of the wall getting past the abutment flashing.

DISABLED WC
New Westmorland slates on breathing sarking felt circa 2000. Check on drawings.
Dampness has occurred in the walls of the WC below.
There are several reasons why this could have occurred.

- The junctions to the original walls have not been provided with wall trays.
- The breathing sarking felt is not providing sufficient ventilation.
- It is now good practice to introduce ventilation at roof abutments to vertical walls.

The concrete stone effect hip tiles are cracked in places.

VESTRY
The last quinquennial reports that the lead hips had been stolen. The hips are now replaced with dark grey clay tiles and these are very satisfactory.

3.02 Rainwater goods and disposal systems

All the rainwater goods are all cast iron appropriately painted grey green. They are seated on drive in brackets. On the north west pitch of the nave the recently inserted DPM material which was to form a new drip has slipped down and is obstructing the gutters.

All the rainwater goods should be thoroughly cleaned, cracked sections replaced, joints resealed and the whole installation needs redecoration. All the brackets should be checked for strength and any loose ones fixed with an appropriate resin mortar. Over point any resin repairs with lime mortar.

Particular attention should be paid to:

- A missing RWP over the boiler room roof.
- Cracked sections of guttering to the North West pitch of the nave.
- The 90 degree bend between the North West nave wall and the transept. Water is spilling onto the wall face here from the valley gutter.

3.03 Drainage below ground

RAINWATER GULLIES
The rainwater pipes discharge into clay gullies. When we inspected, three of these were blocked and had standing water in them. These were cleaned out and are now working correctly. It is not known where the gullies are piped to and this should be investigated.

FRENCH DRAIN TO NORTH WEST ELEVATION
On this side the ground of the church yard rises rapidly away from the building.
A French drain has been dug against the wall and a small retaining wall inserted about 600mm from the church wall. It is not clear how this is piped and where it discharges to.

CHANNEL DRAIN TO PORCH
Recently installed. This seems to be working well and is protecting the porch effectively. It should be possible to find out where it runs to.

FOUL DRAINAGE
The WC is connected to a septic tank which is located to the north east of the church in the car park. One roof pitch also drains into the foul system to keep it flushed.
There is a herring bone of discharge drainage in the land adjacent to the car park.

All recent work is in good condition.

3.04 Bellcotes, Parapets, Chimneys, Verge upstands

BELLCOTE
Subject of a major repair in 1959.

The bellcote was inspected by the builder from a roof ladder. He did not see any deficiencies in the construction. There are no signs of leakage from it. These would appear in the plaster of the south west nave gable at high level.

WATER TABLES
Subject of a major repair in 1993.

Red Clay and dressed sandstone. They are laid over lead flashings and bedded in cementitious mortar. The joints between them are lapped and bedded.

These seem to be in reasonable condition and no internal water ingress seems to be currently attributable to any deficiencies in the water tables.

3.05 Walling

WALL CONSTRUCTION

All the external walling is all of the local grey green stone, laid in two leaves with the occasional through stone connecting the leaves. The external quoins and the stones abutting the openings are regularised to more rectangular shapes but not formally dressed. The historic documentation research reveals that the original building would have been finished in a lime harling. The remnants of this were removed in the 1960s prior to major repointing and silicone water proofing works.

Steve Gebbels drilled the walls and this revealed that the core contains many voids and there is little sign of mortar being used to fill the voids. The drilling dust indicated that the 1960s pointing mortar was cementitious. The drilling showed the 1960s mortar to be about 100mm deep. No signs of the original lime bedding mortar were encountered.

In the Lake District area much of the local slate is split along the bedding plane when it is quarried. This allows the stones to be laid to a sloping bed which encourages the water in the wall to flow to the outer face of the wall. This makes a very weather tight wall. There is no sign of these walls being made in that way. The character of this wall stone is too random and uneven for the sloping bed method to have been adopted.

The church was built in two phases; the original nave and then the transepts and chancel were added later. The wall construction method was the same for both phases.

The historic documents state that major repointing was done in the 1960s using a lime mortar mix which was then ‘knocked up’ with Portland cement just prior to application. There are a few areas where you could argue that the mortar is failing and driving rain will be getting into the wall. Where moisture is entering the wall it will be trapped in the wall as the cementitious mortar will not breathe.

Any future repointing should be done in a ‘cement free’ NHL 3.5 lime mixed 1:2.5 or 1:3 with course sharp sand. The pointing should be slightly recessed and knocked back to expose the aggregate. This will produce a much more breathable, moisture permeable wall.

MOVEMENT IN WALLS

There are some signs of minor movement in the walls. Generally this appears around the openings as fine cracks in the mortar. The south east facing transept gable appears to lean outwards and there is some fine cracking associated with this. None of this is of serious structural concern but rain water could be getting into the wall through the cracks by capillary action.

As a rule of thumb for structures of this type cracks wider than 5mm should be inspected a by a structural engineer. Currently there are no cracks wider than 3mm.

In 1994 works were carried out to point up open cracks around the windows. Please see Appendix 3 for the details of this work.

PAST GROUTING

In the 1960s an attempt was made to grout the voids in the walls. This proved to be difficult as the grout flowed out of the foundations and into the ground. The 1961 quinquennial implies that the contract was stopped when the grouting was believed to have reached 225mm above floor level.

On the west gable wall there are signs of carbonate build up at this level where water has been leaching out of the wall. This could indicate the top level of the grouting.

2000s CAVITY WALL CONSTRUCTION
The recent extension for the WC was built with modern insulated cavity wall construction. This is fully recorded on the architect's drawing.

3.06 Timber porches, doors and canopies

EXTERNAL DOORS
All modern oak frames and oak boarded leaves with clear finish.

OUTER PORCH
In good condition

INNER PORCH
The original stone dressed opening is damp and this means that the wooden frame is very damp and there is evidence of mould growth, possibly rot, on the south jamb.

DISABLED WC
This has expanded and will no longer open. It suffered badly in the recent floods.
It should be adjusted to fit properly by a good joiner and redecorated to resist future swelling in damp conditions.

3.07 Windows

STONE FRAMES OR TRACERY
These are all finely dressed local green sandstone and generally single or multiple lancets. The stone is hard and shows little sign of erosion on the faces. The tops of some of the lancets have lead over flashings. The flashing which was opened up during our inspection went at least 200mm into the wall.

The vertical, wide, cementitious pointing around the frames where they meet the rubble walling is generally in poor condition and cracked.

In 1994 works were carried out to point up open cracks around the windows. Please see Appendix 2 for the details of this work.

The generally horizontal, very fine, original pointing between the dressed stones has often been eroded away and not replaced. This may be causing some minor leaks, encouraged by capillary action. The original builder's intention was probably that these would be sealed by the lime washing which would have followed the application of lime harling.

The inner faces of the stone frames are generally painted. The church should consider removing this paint and re exposing the stone work.

GLAZING
The church's leaded light windows; both plain quarry and stained glass, seem satisfactory but a thorough report by an expert in this field should be commissioned. The pointing between the glass and the stone frames should be replaced with NHL 3.5 lime mortar.

The 1994 outer protection in Makralon sheet is discolouring. The document in Appendix 2 states that this was fitted to help the stained glass resist the driving rain. Prior to fitting this protection the windows did leak.

The white plastic ventilators fitted to two nave windows are unsatisfactory. Is there an inventory and description of the stained glass windows available at the church?

4.0 Internal Elements

4.01	Towers, spires	None
4.02	Clocks and their enclosures	None
4.03	Roof and ceiling voids	The only roof void is in the new extension. It was not inspected on this visit. However a thorough inspection to establish whether this void is sufficiently ventilated is recommended.
4.04	Roof structures and ceilings	ALL ORIGINAL CHURCH AREAS The original softwood trusses and roof soffit boarding are exposed in the chancel, transepts and nave. They were viewed from below and no signs of decay etc. were seen. Ideally the roof soffit timbers would all be inspected from an access platform to check for insect attack and decay. We assume this has not been done since the 1993 works. PLASTER CEILINGS TO WC AND KITCHEN EXTENSION Suffering from damage from damp.
4.05	Internal structures, arcades, upper floors, balconies, access stairways	None
4.06	Emergency means of escape.	MEANS OF ESCAPE: There is no formal means of escape. The routes through the vestry and kitchen should be kept unlocked during services to provide alternative routes.
4.07	Ground floor structure, timber platforms	NAVE Red Sandstone flags bearing on the ground. A flag was lifted and we observed that they are bedded on a mix of earth and gravelly sand. The top of the bed seems to have had lime mixed into it as it is lightly coloured. The pit that was dug showed no signs of standing water even after a couple of hours. However the earth was moist as was the underside of the flag that was lifted. The top surfaces of the flags were moist in many places. The perimeters of the flags were particularly moist as if the moisture is wicking up the mortar joints between the flags. The moisture on the surface of the flags could also be caused by condensation. We have installed a trial DPM under the lifted flag to see if this will show if the moisture was mainly rising through the flags or condensing from the air. HEATING DUCT The duct is approximately 1500mm deep and now serves no useful purpose. Ideally it would be infilled. The cast iron grille and concrete surround would be replaced with matching flagstones. This was found to only be damp to 75mm above the base level. TRANSEPTS AND CHANCEL Square terracotta tiles set diagonally. All in reasonable condition with only minor signs of moisture issues. SANCTUARY Green dressed slate steps and perimeters with Brathy Black flags between. Condensation does occur on these cold surfaces which could make them slippery but causes no distress to the material.

MOISTURE INGRESS INTO THE CHURCH
This mainly seems to occur through the flagged floor. Serious consideration should be given to introducing a waterproof membrane into the floor. Reducing the humidity in the church should improve many of the other damp issues within the building.

4.08 Internal finishes

INTERNAL FINISH TO THE EXTERNAL WALLS:
Originally all the walls will have been lime plastered. Evidence of this can be seen be on the wall surfaces of the north west transept which are concealed behind the organ. The original lime plaster remains in acceptable condition in many areas.

AT LOW LEVEL
The original lime plaster has been replaced in most low level sections with a mix of unsuitable, often gypsum based materials, which are not suited to moist conditions and suffer expansion and cracking when exposed to migrating salts.

We have looked at various samples of the plaster in the church which are all unsuitable materials and we conclude that general replacement is required.

AT HIGH LEVEL
Damaged areas appear to have the original lime plaster still in place. On the north west wall of the nave the damage occurs above window head level. This is certainly lime plaster and it seems to have been damaged by long term water leaks from the roof.

Some plaster repairs were done in the 1993 works. Sika 1 cement render and renovating plaster was specified and this remains in good condition.

TO SOUTH WEST GABLE OF NAVE
There seems to be little damage to the plaster at high level. The serious damage relates to concentrations of salt migrating from the areas below the central triple lancet window. This could be caused by water leaks associated with the windows and or condensation from the moist air within the church.

WINDOW REVEALS
Plaster to these areas suffer from:

- Cracking when there is any slight movement between the inner and out leaves of the wall. This can allow water ingress from the core.
- Cold bridging as the masonry is thinner in these areas. This leads to condensation occurring.
- Black mould growth. This should be regularly treated with a weak bleach dilution.

ROOF SOFFITS: refer to 4.04

4.09 Fittings, fixtures, furniture and movable articles

Generally not relevant to this report.

PEWS
We record that the Pews are screw fixed down to the floor and therefore they can be easily removed and replaced if the floor is upgraded.

5.0 Services

5.01	Services installations generally	The inspection has been purely visual and no test certificates were available.
5.02	Heating installation	HEATING This is an electrically heated pumped water system with large bore pipes and radiators. It is nearing the end of its useful life. DEHUMIDIFIER A humidifier was running adjacent to the sanctuary.
5.03	Gas installation	Gas has not been brought to the church. The 2006 architect's drawings indicate it may be available in the village.
5.04	Electrical installation	Major work was done on the electrical installation in 1993. This should mean that the wiring should be all PVC insulated. A full test by a qualified electrician is recommended.
5.05	Water installation	There is a new modern mains water supply to the boiler room and this extends into the kitchen and WC.
5.06	Oil installation	none
5.07	Sound system	Not relevant to this report
5.08	Lightning conductor	Conductors are fitted to the bellcote only. These should be tested.
5.09	Fire precautions	There are insufficient fire extinguishers in the church. Those that are present have been tested within the last 12 months. *Work Required: The provision of fire extinguishers should be increased to meet the requirements set in the Diocese Quinquennial Notes.*
5.10	Asbestos	No obvious signs of materials which may contain asbestos were recorded during the inspection.

6.0 Curtilage

6.01	Churchyard	Kept in very good condition.
6.02	Ruins	None
6.03	Monuments, tombs and vaults	The inspection of the condition of the external monuments was beyond the remit of this report.
6.04	Boundary walls, lychgates, gates, fencing and hedges	The boundary walls are stone with cement bedded cappings. The walls are a vital flood defence and the openings are fitted with modern flood gates. During the recent flooding the water was successfully kept out of the church. .
6.05	Trees and shrubs	Not relevant to this report
6.06	Hardstanding areas	CAR PARK There is a generous car park to the north east of the church with a grass surface laid over a geotextile reinforcing membrane.
6.07	Buildings within the curtilage	EXTERNAL BOILER ROOM A semi basement arrangement which is in reasonable condition. It has a sump pump system to keep the basement reasonably dry. The basement did not flood during the recent rains.
6.08	Notice Boards	Not relevant to this report.
6.09	Disabled Access	This issue has been successfully addressed with the provision of a WC and gentle ramped access from the car park.

7.0 Flood Risk

7.1 The adjacent water course

The church sits on the 80 metre contour adjacent to Church Beck. This water course originates four kilometres away at the top of Grisedale Pike which is 791 metres high. It flows to Bassenthwaite Lake which is one kilometre to the north and at a level of approximately 70 metres. Just to the north of the church the river passes over the A66 trunk road in an aqueduct. Adjacent to the church and directly upstream of the church the stream has been straightened and the banks have been formed with sheet piling.

Members of the church have a photographic record of the height of recent flooding. These photographs have been incorporated in to appendix 2. We have annotated each photograph with notes which give the estimated levels to which the water reached.

- This report should be shown to the environment agency so they have an understanding of the flood risk to the church.
- The force of the flood water may have led to stone from upstream being deposited in the water course during the deluge. If this is the case the cross sectional area of the watercourse could have been reduced. This could lead to the water course having a reduced capacity to deal with a future flood.
- Minor modifications to the ground levels around the church car park could lead to a reduced risk of the church flooding in the future.

To understand this issue fully and to argue the case for any modifications required to improve the flood protection of the church the assistance of a specialist consultant engineer may be required.

APPENDIX 1

REPORT ON HISTORIC DOCUMENTS

APPENDIX 1
HISTORIC DOCUMENTS REPORT

1.0 1961 **STONE WORK CONSULTATION**
LT COL B C G SHORE commissioned by Architect R.P.Gray

External Walls: The building stone used is locally sourced and originates from the slatey rocks and sandstones of the Siddaw Slate Series. Muds and shales metamorphosed into inconsistent slates. Undoubtedly water does penetrate between the leaves of some of these slates by capillary action.
The architect reported that the walls had been grouted at ground level.
Generally the mortar joints are wide and the proportion of mortar to stone is high.
Existing pointing very poor quality. Some very weak some too strong.

Interior Wall Faces: Great patches of sulphate crystals at the west end.
Penetration of water through the west end windows could be heavy.
Base of the walls at low level show rising damp.
No need to grout the walls at high level.
Repoint with a moderately strong mortar to a depth of 1 ½ inches.
Mix 1 part hydrated lime to 6 parts very coarse sand.
Knock up mortar with 1 ½ to 2 parts cement to 6 parts mortar.

Water will always penetrate the walls even after repointing,

The report contains a detailed history of the development of water repellent chemicals for use on stonework.

The report proposes the application of a silicone water repellent coating.

2.0 1964 **SECOND QUINQUENNIAL REPORT**
R P GREY MBE FRIBA AMTPI of Whitehaven

Structural: Grouting carried out to 9 inches above floor level this has improved the foundations of the walls. Further grouting may not be necessary.

Walls: The advice of the consultant LT. COL Shore was carried out. The remaining old roughcasting was hacked off, the joints racked out, pointed and treated with silicone. It is probable that all the moisture in the walls has now disappeared.
The internal walls are finished in flat oil paint which is particularly vulnerable to moisture. This will serve to indicate where moisture is still present in the walls.

The impervious nature of the stone which only allows evaporation to occur through the joints. Any moisture penetrating the joints is not absorbed into the stone. A further application of silicone solution to the joints is therefore desirable.

The bell to the bellcote was renewed in 1959.
Gutters and pipes are now in good condition.
The drainage should be looked into. The boiler house has flooded recently.
Trapped gullies and short lengths of drain and soakaways should be installed. This will reduce the dampness in the floors and foundations.

INTERIOR
No damp patches internally but plaster blowing and damage to internal finishes has occurred due to small amounts of moisture being present in the walls.
One large patch of what appears to be gypsum plaster has been applied to the north wall close to the entrance. This should be hacked off.

INTERNAL FLOORS
The existing floors are in reasonable condition. The floor of the nave is very damp at the time of inspection. When money is available they should be re-laid on a sub floor of concrete with waterproof membrane.

HEATING SYSTEM
Boiler house flooded. Steps to prevent this required. New heating system needed to replace solid fuel boiler.

SUMMARY
All a considerable improvement from the first survey.

3.0 1967 LETTER TO VICAR
R P GREY MBE FRIBA AMTPI of Whitehaven

The grouting of the walls was stopped because it was proving to be very expensive. LT COL Shore regarded what has been done as sufficient.

4.0 1968 CORRESPONDENCE FOR PLASTERING WORKS
QUOTATION
One scratch coat in 3:1 sand cement and a further waterproof undercoat to a true line. When set give a coat of neat thistle plaster and finish true. 4ft 6 high to N and S Walls.

CC Note: The dispute about costs not relevant to this report.

5.0 1985 QUINNQUENIAL INSPECTION
CLIVE BARNABY of Keswick

CC note: No report available. Referred to in 1990 QI

6.0 1990 QUINNQUENIAL INSPECTION
W B EDWARDS AND PTNRS of Newcastle upon Tyne

CC note: A very detailed quinquennial reporting many problems. This was followed by the 1993 works. Please refer to the description of the works carried out in 1993.

Recommendations to reduce ground levels to the west elevation of the church to below internal floor level. Hand written note: this was done by volunteer labour.
Remarks that originally the whole of the church was probably rendered externally this a lime harling.

7.0 1992 ELECTRICAL MODIFICATIONS
W B EDWARDS AND PTNRS of Newcastle upon Tyne
Project 1154
Drawings AL(0)1 & 2 Existing and Proposed Drawings.

8.0 1993 MAJOR REFURBISHMENT
W B EDWARDS AND PTNRS of Newcastle upon Tyne
Project 1132
Drawings AL(0)8 to 14 inc.

CC note: Major and extensive structural works to the heads of the walls, wall plates and roof structure.

Large patch repairs to roof weathering and leadwork. Rebedding of the red clay water tables. New sections of water tabling cut from red sandstone.

Plaster repairs in waterproof cement render Sika 1 additive and finish of thistle renovating plaster.
Dulux emulsion paint decoration. *CC Note: Probably not breathable.*
Vestry plaster all replaced with waterproof render.

Both transept gables rebuilt. Upper windows replaced by poor ventilators.

9.0 1994 **LETTER: FURTHER WORK ON WINDOWS**
W B EDWARDS AND PTNRS of Newcastle upon Tyne
Project 1132

Detailed list of further works to the windows.
CC note: Full copy included in Appendix 2.

10.0 1999 **REPORT ON DAMPNESS AND HEATING**
CUMBRIA COUNTY COUNCIL DESIGN SERVICES

CC note: This is a very useful report.

Roof: no particular issues with the roof weathering reported.

Walls: external repointing in very strong cement mortar in good condition. Some minor movement recorded. The cement mortar inhibits the walls drying out.

Floors: Damp stone flags below carpets. Condensation occurs on the slate floors to the sanctuary. The salt deposits on stone flags indicate rising damp.

Internal Environment: Humidity levels were very high. 100% during wet weather. When the church was in use the humidity levels dropped because heating was on and air changes occurred. The ventilation rate is very low when the church is unoccupied.

Rising Damp through the floor is a major issue.

Penetrating Damp through walls could be issue around windows and minor cracks in the walls.

Condensation: the classic symptoms are present. It is a major factor in the problems currently being experienced. It is even occurring during warm weather due to lack of air changes within the church and the slow thermal response of the building.

CC note: Conclusion well written and clearly explains the issues.
See Appendix 3 for a full copy of the conclusion.

Recommendations:

Walls: Remove existing wall plaster and add a separating membrane.
Replaster using a renovating plaster.

Floors: Add a damp proof membrane where ever possible, e.g not under organ and leave slate flagging in sanctuary.

Construct drain around west wall: this was carried out.

Increase Ventilation and Air Movement to reduce relative humidity.
Provide Dehumidifiers.

Heating: replace current system: provide constant background heating.

Redecoration: Water based paint with antibiotic recommended to reduce mould.

Heating Report: Heat loss of the building 39kw. Running background heating at 8 degrees would double the current heating bill. This would reduce the occurrence of condensation considerably and keep the fabric dry.

11.0 2001 **QUINNQUENIAL INSPECTION**
Acanthus Lowe Rae Architects of Penrith

Install vents to transept gables. *CC note: It looks as though this was confirmed in 2008 QI*. Further vents also recommended. *CC note: not carried out.*

12.0 2006 **NEW TOILET AND KITCHEN EXTENSION**
ADK Architects
Stephen A J Harwood RIBA of Keswick

Tender drawing for the contract.
CC Note: Slight differences to what was actually built.
New water supply added at this time.
A gas pipe was proposed to share the water pipe trench.
CC Note: We assume that this was not installed.
CC Note: With reference to the damp stains in the WC cubicle. The abutment flashings over the new roof dress into the external face of the church wall but there is no indication of ventilation or installation of wall trays into the original masonry.
There is a breathing membrane installed under the slates.
CC note: Perhaps ventilation of the abutment flashings should have been installed.

13.0 2008 **QUINQUENNIAL REPORT**
ADK Architects
Stephen A J Harwood RIBA of Keswick

Existing roof construction: Slates on a lime bed without battens.
CC Note: We would be very surprised if this is the case. The lime bed will now have turned to loose dust and the slates would be loose on the nails. We would think that there will be battens in place. Our experience on other churches has found that these battens are often poorly fixed to the main roof structure.

Bitumen felt sarking has been added in places where major repairs have been carried out.
CC Note: Generally this is over the walls at the eaves.

Existing floor construction: the dampness does not affect the use of the church but will be contributing to the overall moisture content with in the building.

The urgent works list only includes only minor repairs

The long term works list includes major proposals:
Walls: for removing all the interior plaster and replacing it with a Sovereign water proof render system. Possibly with insulation incorporated. Subject to listed building consent. The use of lime plaster is discussed. It is suggested that this should only be used if the external pointing is replaced with lime.

Internal Floors: Take up the existing floor to the whole area of the original church. Relay with DPM and insulation.

Roof: Relining the roof with insulation from the underside suggested. Reference to re-laying the weathering membrane made in the longer term proposals section.

Consideration of installing a gas supply: The cost of a gas supply from the road in 2006 was £8,000 plus builders work. This was considered prohibitive.

14.0 2011 **QUINQUENNIAL REPORT**
Cummings Day Architects

Some minor works have been sorted out by a recent minor works contract by Lakeland Stonecraft. New Acco type drain at entrance.

Faculty for replacement hips for vestry has been obtained. Work to be carried out. Dampness issues not yet tackled.

15.0 2012 **ROOF WEATHERING LIFTED AND RELAID**
During the inspection we were told verbally that the nave south east pitch and the south transept south west pitch have been re-laid. The works incorporated a new breather sarking felt.

CC NOTE: No correspondence available to us for this work. It would be really useful to see photos from when this work was done. We will add any further information supplied into this report.

APPENDIX 2

NOTES ON 1994 WINDOW WORKS

W. B. Edwards and Partners
Architects

W. B. Edwards Dip.Arch. ARIBA
A. Walker B.Arch., A.R.I.B.A., Hon.F.I.C.W.

Cathedral Buildings · Dean Street · Newcastle upon Tyne NE1 1PG · Telephone: (091) 232 8026

FOM/JEC/1132/7.0

V.A.T. Reg. No. 176 0058 70

23 March 1994

Laing Stonemasonry,
Dalston Road,
Carlisle,
Cumbria,
CA2 5NR.

For the attention of Mr P Hingley

Dear Sir,

Church of St. Mary : Thornthwaite : Keswick

Further to our joint meeting together with the Vicar, members of the Parocial Church Council and Elders Glass, we wish to confirm the following points agreed with regard to further work to the windows and surrounds :-

Window W2

a) Point external perimeter joint twixt window glass and cement pointing to slate jamb in clear mastic.

Window W3

a) Point external perimeter joint twixt window glass and cement pointing to slate jamb in clear mastic.

b) Cement point joint twixt R.H. slate jamb and cill.

Window W5

Cut out cracked vertical cement joint twixt R.H. slate window surround and random stone wall both above and below window cill - approximate length 1200mm.

Window W10

a) Attend to water leakage at joint between 1st and 2nd stained glass panels to R.H. (west) window - mainly R.H. side when viewed from inside.

b) Rectify reported leakage from soldered joint to mid R.H. panel approximately 1200mm above seat level.

c) Point external joint twixt window glass and cement pointing to slate jamb in clear mastic.

d) Refit lead flashing to top of slate window surround to arched head to give tight joint and ensure lying flat against slate. Clear mastic point at base of L.H. side flashing.

Continued....

TO : Mr P Hingley Laing Stonemasonry Dalston Road Carlisle Cumbria

e) Seal top edge of lead flashing where tucked into wall and forming small ledge with clear mastic.

f) Cut out, remove and replace badly laminated slate stone located approximately 300mm above head of arch.

g) Identify, cut back and point up loose/missing pointing and open joints between stones in approximately 6 - 7 locations around window.

h) Point/seal joints in slate mullion at springing line of trefoil and adjacent.

i) Apply clear mastic seal to laminated slate keystone to arch (laminated into approximately 3 No. pieces).

Window W12

a) Point external perimeter joint twixt window glass and cement pointing to slate jamb in clear mastic.

b) Rake out and repoint joints twixt jambs and cill.

c) check leak soakers/flashings to edge of jamb/boiler house roof; fit back to lead surround; seal as necessary untidy edge of cement fillet.

Window W14

a) Point external perimeter joint twixt window glass and cement painting to slate jamb in clear mastic.

b) Fit 'Lexan' polycarbonate sheet as overglazing with gaps at top and bottom and edges sealed in clear mastic.

Window W15

a) Point external perimeter joint twixt window glass and cement pointing to slate jamb in clear mastic.

Yours faithfully,

W. B. Edwards & Partners

Copy to : Mrs J Newsome

APPENDIX 3

CONCLUSION FROM 1999 REPORT

Conclusions

It would appear that the main causes of the dampness are penetrating and rising dampness in the west and south walls of the nave, the east wall of the transept and from the floor. The moisture evaporates into the air and is then trapped inside the church due to lack of ventilation. The evaporation continues until the air reaches saturation point when condensation occurs on the coldest surfaces initially but then spreads to other areas when conditions are suitable (a falling temperature or onset of wet or humid weather). The lower the internal temperature the quicker saturation point will be reached. When ventilation levels are increased (by use of the hall, ventilation taking place via the door), the humidity of the internal air is lowered and condensation is prevented for a time until the evaporation causes saturation point to be reached once again. When condensation occurs regularly, mould spores become established and black mould flourishes on the wall, roof and floor surfaces with the surfaces which are subjected to the least air movement and the coldest temperatures being the most badly affected. The action of water drying from the walls results, in the long term, in salts from within the wall materials being deposited at the surface. These salts are hygroscopic and absorb moisture from the atmosphere into the wall, aggravating the dampness problem.

Other Considerations

It was noted that the banking of the nearby beck is lined on the west side by sheet piling. This will probably penetrate the ground to a depth of 2m or more below the level of the beck. The course of the beck may have been altered in the past. This may have the effect of slowing down or preventing drainage from the site of the church and result in the raising of the water table for some time following heavy rainfall. It may also have cut off surface water drains, which would originally have discharged into the beck. Further investigation should be made into the records of the Environment Agency and to this end it is recommended that an enquiry be made to the local officer.

Recommendations

Recommended action is based on the following principles:-

- Prevent moisture entering the building as far as possible
- Remove excess moisture from the internal atmosphere to maintain humidity levels at a level low enough to prevent condensation occurring
- Provide sufficient heating to maintain the temperature of the structure at a sufficiently high level to prevent condensation occurring.
- Repair existing damage and revise construction details to prevent further damage.

Remove existing wall plaster from the east and south walls of the east transept, the east, south and west walls of the nave and the south and west walls of the nave. Provide a separating membrane such as "Newlath" which is fixed to the walls and carries the new plaster but separates it from moisture within the wall. Re-plaster using renovating plaster, which will remove all the old salt-contaminated plaster and ensure that no further spoiling occurs. In effect this will create a "cavity" in the wall to prevent moisture transmission but will allow release of vapour behind the membrane. This vapour will have to be removed by ventilation or by dehumidifiers.

Provide a damp proof membrane in the floor. This work would entail the removal of the pews and lifting of the stone flag floor. The level would be reduced to allow a polythene membrane to be laid and protected by a layer of sand. The floor would then be re-laid on top and the pews reinstated. The membrane should be continuous with overlapped and sealed joints and should be turned up the walls to link with the "Newlath" separating membrane. It is not thought necessary to remove the plinth at the altar end of the church and work could be limited to the nave and those parts of the transept outwith the plinth. This would avoid disturbing the church organ.

Construct a drain around the west side of the church to keep the base of the wall as dry as possible. This will be a continuation of action already taken. The drain should be laid inside the existing gravel trench and run continuously from the vestry to the southeast corner where it should connect into the existing surface water drain. A grating connected to the drain should be provided at the entrance door to the church to ensure no entry of surface water from the footpath Further investigation should be carried out into the point of discharge of the existing rainwater system.

Increase ventilation and air movement. Currently the windows are sealed by polycarbonate sheets intended to prevent rain penetration. This has resulted in a significant reduction in ventilation and air movement. It is recommended that the polycarbonate sheets are either removed or have holes drilled in them to the equivalent openable area of the windows. By drilling holes approximately 20mm in diameter ventilation can be achieved without losing rain protection and preventing access to birds. Because of the very small area of openable windows present it is not possible to achieve a high enough level of ventilation to remove excess moisture by means of ventilation alone. Consideration should be given to modifying the existing fixed windows at the south wall, perhaps, to provide additional openable window area. It is recommended that dehumidifiers be used in conjunction with natural ventilation.

Provide dehumidifiers controlled by humidistats. These will automatically reduce the moisture level in the air and help to prevent condensation. They are economical to run and unobtrusive. They are of particular use in dealing with a sudden rise in humidity as occurs during a church service and will assist with drying out of the building following remedial measures.

The heating boiler and controls should be replaced with a more efficient system and action taken to ensure that constant background heating is available.

Redecoration: If possible redecoration should be delayed until the walls have dried out considerably. Water based paint (emulsion) should be used and not oil based paint which seals in moisture and will blister and peel. An antibiotic additive should be used in the paint to protect against mould contamination.

APPENDIX 4

PHOTOGRAPHIC FIGURES

EXISTING SLATE WEATHERING

This is in poor condition. It seems to have been patched many times.

The photo above shows exposed sarking felt where the slates do not overlap properly.

The photo to the left shows a leadwork patch.

The building contract documents for the work of 1993 asked for major patching of this pitch.

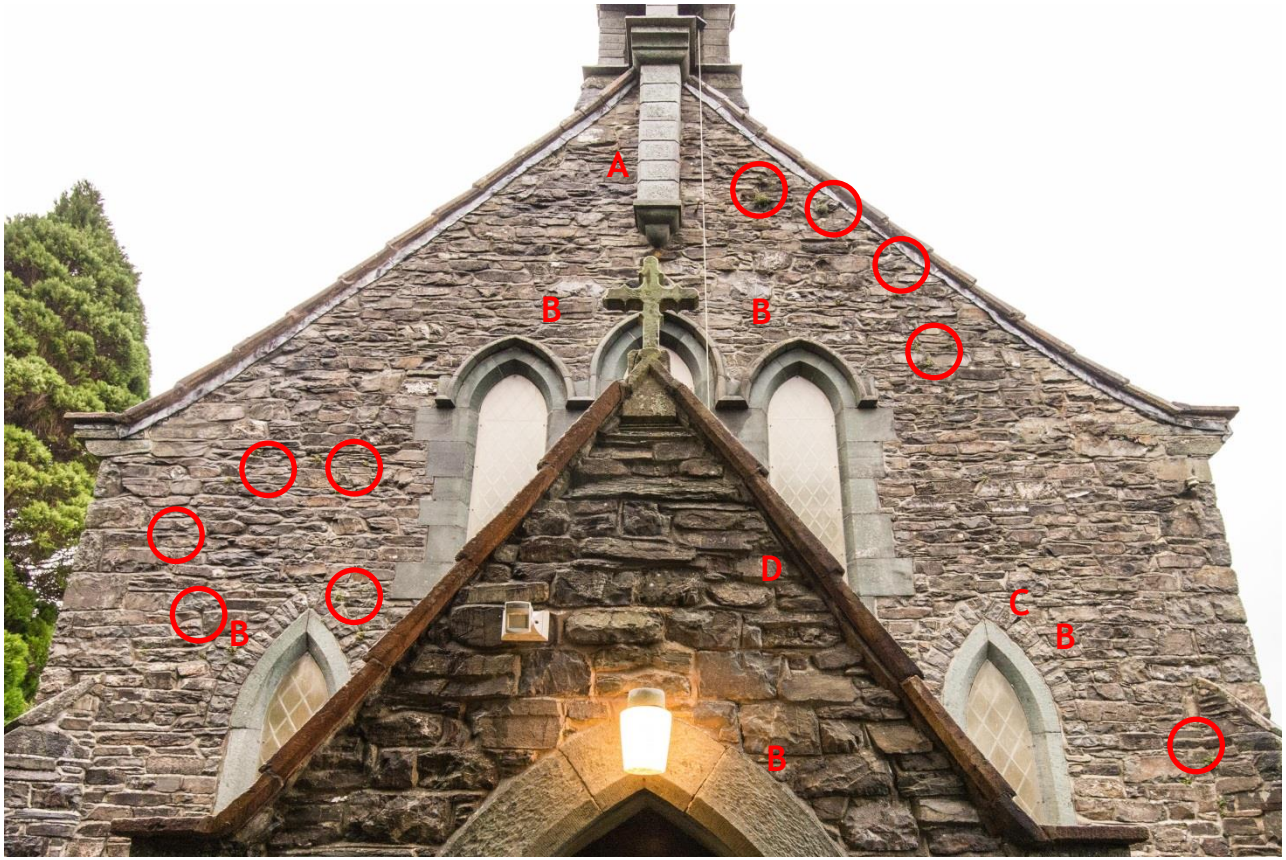
EXISTING CAST IRON GUTTERING
The gutter is blocked by a recently inserted drip flashing which has slipped into the gutter. A cracked section of gutter prevents water getting to the down pipe. Currently water is running from the gutter down the face of the wall.

RECOMMENDATIONS
See paragraphs
2.01 Initial repairs required this spring
2.02 longer term re roofing

Countryside Consultants
Architects & Planners
Townhead, Alston, Cumbria. CA9 3SL Tel: 01434 381906
www.countryside-consultants.co.uk

Thornthwaite: St Mary,
Thornthwaite Cum Braithwaite
Cumbria

1. NORTH WEST NAVE ROOF ISSUES



KEY:

Small patches of vegetation growing in mortar. This implies that the wall is constantly moist.

A: Open joists between dressed stones.

B: No lead flashings to the heads of windows. These are fitted to windows in other walls.

C: Open joints which will allow water into the wall. Fill with lime mortar a.s.a.p.

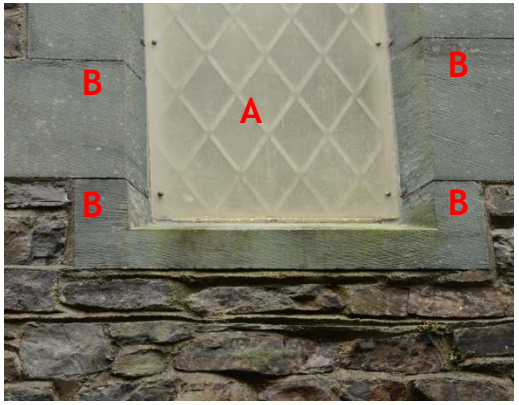
D: No lead flashings under water tables to porch gable.

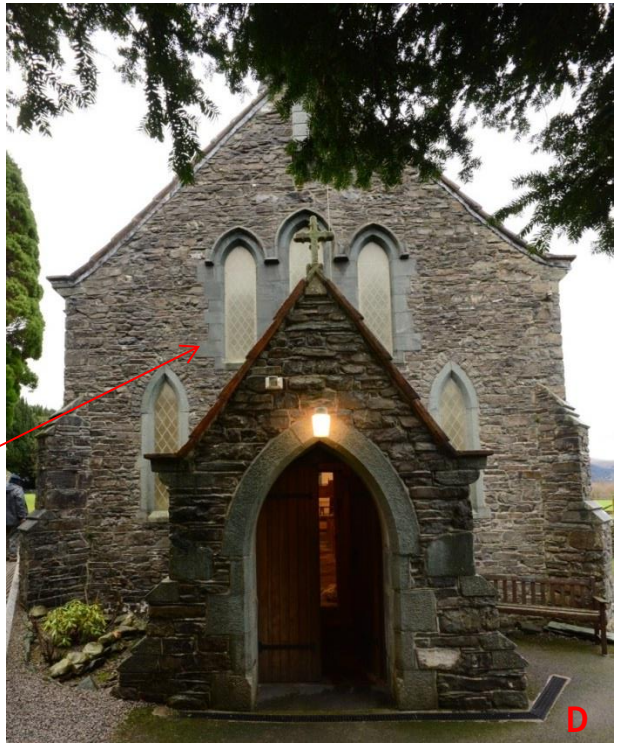
RECOMMENDATIONS:
See paragraph
2.05 West gable external wall face works

Countryside Consultants
Architects & Planners
Townhead, Alston, Cumbria. CA9 3SL Tel: 01434 381906
www.countryside-consultants.co.uk

Thornthwaite: St Mary,
Thornthwaite Cum Braithwaite
Cumbria

2. EXTERNAL SOUTH WEST NAVE GABLE WALL ISSUES





The South west facing gable faces the prevailing wind and catches all the driving rain. Therefore these walls often suffer from damp. When originally built the church walls were protected by a coating of lime harling and lime wash. The wall at the back of the porch is very wet. There is no ventilation in the porch.

KEY:

A: Plastic sheet protection added to window in 1993.

B: Very narrow joints originally sealed with lime wash. Water now leaking into the building interior. This causes the green growth on inside face of window frame.

C: Cement mortar fillet flashings are cracked and there is no tray across the cavity. The wall face in the porch is therefore very wet.

D: Drainage channel recently installed.

RECOMMENDATIONS:

See paragraphs

2.01 Initial repair works required this spring

2.05 West gable external wall face works

Countryside Consultants
Architects & Planners
Townhead, Alston, Cumbria. CA9 3SL Tel: 01434 381906
www.countryside-consultants.co.uk

Thornthwaite: St Mary,
Thornthwaite Cum Braithwaite
Cumbria

3. SOUTH WEST GABLE WALL ISSUES

SANDSTONE FLAGS IN THE CENTRAL AISLE
The dark areas are damp. This could be rising damp and also condensation. The feet of the pews are fixed to the floor with mirror plates and woodscrews into plugs.

OPENING UP THE FLOOR AND INSTALLING A TEMPORARY DPM
The flags are laid directly onto gravelly earth. The base of the 350mm deep pit was left open for about 2 hours. During that time the base did not get any wetter. The underside of the lifted flag was damp. There is no evidence of any type of damp proof membrane ever being installed. This must be the main source of humidity in the church. We have installed a temporary DPM below the flag that was lifted. This experiment should help establish whether the issue is 'rising damp' or condensation.

OLD HEATING CHAMBER
The iron grille in the aisle of the nave covers a chamber about 1500mm deep. This would have been part of a ducted air heating system. If the floor was to be re-laid the void would be infilled.

RECOMMENDATIONS:
See paragraphs
2.03 Floor works
2.04 Heating system

Countryside Consultants
Architects & Planners
Townhead, Alston, Cumbria. CA9 3SL Tel: 01434 381906
www.countryside-consultants.co.uk

Thornthwaite: St Mary,
Thornthwaite Cum Braithwaite
Cumbria

4. SANDSTONE FLAG FLOOR TO NAVE

EXISTING LOW LEVEL PLASTERWORK
Below - - - - - -
This is plasterwork carried out in 1968. Cement based render with hydrated lime and waterproof additive. Followed by Carlite browning and finish
CC note: The Carlite materials will be damaged by salts as they are Gypsum based.

AREA C EXISTING HIGH LEVEL PLASTERWORK
In reasonable condition. It could well be original lime plaster.
CC Note: Bellcote does not seem to be leaking.

AREA D PLASTERWORK
Being damaged by water currently running down the wall from the leaking high level windows.

AREA E PLASTERWORK
Being damaged by water running down the core of the wall.

RECOMMENDATIONS:
See paragraphs
2.06 South west gable internal face works
2.09 Internal paint finishes

Countryside Consultants
Architects & Planners
Townhead, Alston, Cumbria. CA9 3SL Tel: 01434 381906
www.countryside-consultants.co.uk

Thornthwaite: St Mary,
Thornthwaite Cum Braithwaite
Cumbria

5. SOUTH WEST NAVE INTERNAL WALL ISSUES

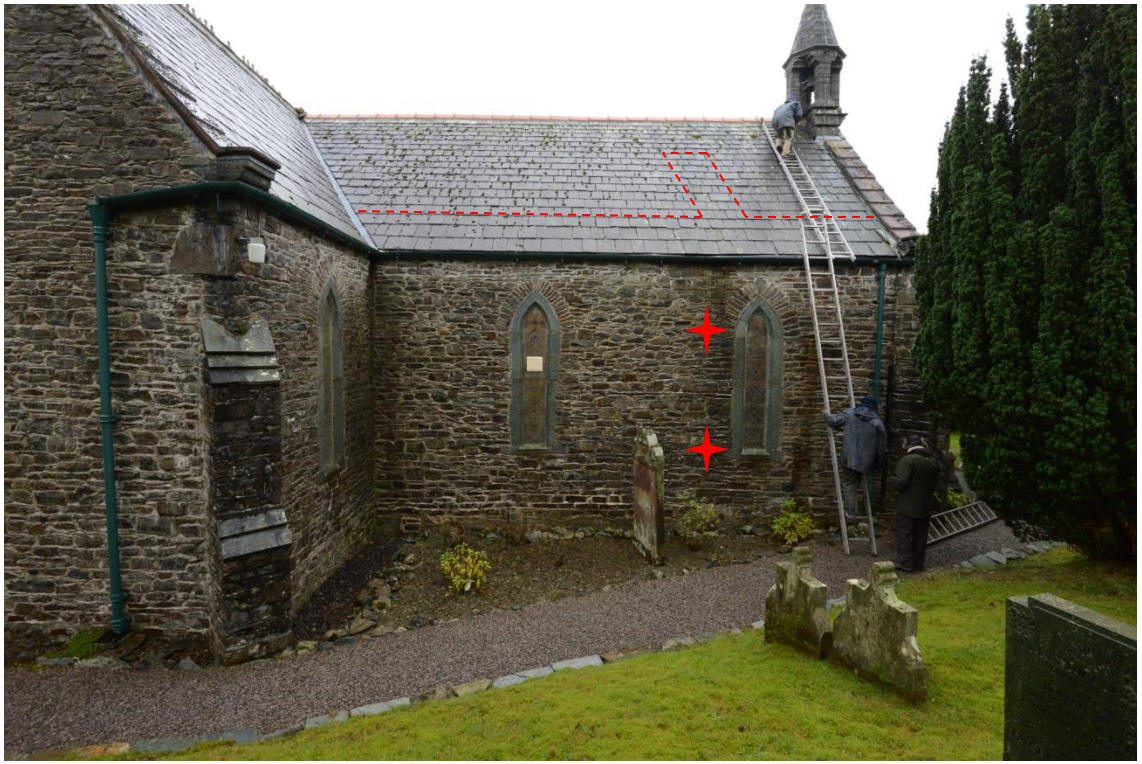
NEW CLAY RIDGE TILES
To nave, originals to transept.

WESTMORLAND SLATE ROOF WEATHERING
Heavily and poorly patched.
Original work on lime mortar bedding.
Below dotted red line
More recent work (referred to in the1993 contract documents) on bitumen sarking felt.

CAST IRON GUTTERING
Not working correctly.
Sections cracked.
Partly blocked by recently fitted drips which have slipped into the gutters

BUTTRESS
These get very damp during prolonged rain.

FRENCH DRAIN
Recently dug. It seems to work effectively but we would advise that the associated drainage is checked.



BELLCOTE
Seems to be in reasonable condition. Some lead flashings need attention.

WATERTABLES
Seem to be in reasonable condition. Some lead flashings need attention.

VISIBLE DAMP AREAS ON THE WALL - Caused by gutters not working correctly. See photos on the next sheet.

WALLS DRILLING LOCATIONS

The mortar is approximately 100mm deep .

The photograph below is taken with an endoscope placed in the upper hole. The small dark circle is the hole in a stone in the inner leaf. There is a large empty void in the core of the wall.

BASE OF THE EXTERNAL WALL The voids in the wall bases have been filled with grout to approximately 250mm above floor level.

EXISTING POINTING
The existing mortar is a cementitious mix applied in the 1960s. It was well applied but it is generally projecting forward of the stonework. There are few open joints. There are hairline cracks between the dressed masonry and the random rubble around the windows.

RECOMMENDATIONS: See paragraphs
2.01 initial repairs required this spring, 2.02 longer term roof works and 2.07 masonry repointing to other elevations.

Countryside Consultants
Architects & Planners
Townhead, Alston, Cumbria. CA9 3SL Tel: 01434 381906
www.countryside-consultants.co.uk

Thornthwaite: St Mary,
Thornthwaite Cum Braithwaite
Cumbria

6. NORTH WEST FAÇADE OF NAVE

AREA A PLASTERWORK
Possibly being damaged by water currently running down the external wall from the damaged gutters.

AREA B PLASTERWORK
Where it is discoloured this could date back to pre 1993 water damage from the roof. This area seems to have been re-skimmed with pink gypsum or plasterboard finishing plaster. This is being affected by salts.

EXISTING LOW LEVEL PLASTERWORK
Below
This is plasterwork carried out in 1968. Cement based render with hydrated lime and waterproof additive, followed by Carlite browning and finish.

CC note: the Carlite materials which contain gypsum will be damaged by salts and should not be used on solid walls.

Basecoat lime plaster possibly original

Topcoat recent pink gypsum finishing skim

EXISTING HIGH LEVEL PLASTERWORK
A proportion of this is old lime plaster. Some patching works occurred in 1993 using cement render waterproofed with Sika 1 and renovating plaster finish.
CC note: the renovating plaster will be resistant to damage by salts.

The majority of high level plaster in reasonable condition.

EAVES BEAM WORKS

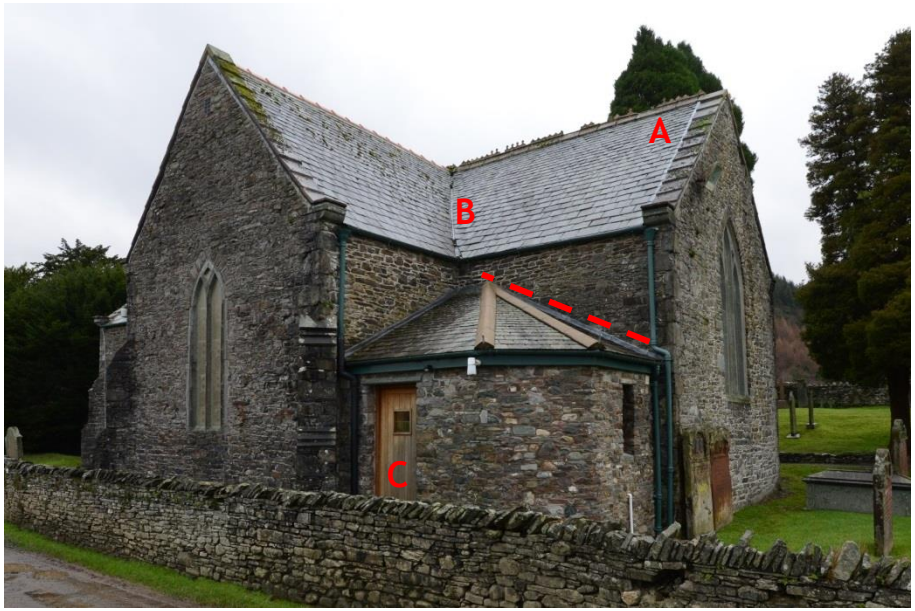
In the 1993 works a reinforced concrete beam was installed to strengthen the wall heads at eaves level. This should prevent water from roof leaks getting into the core of the external wall.

RECOMMENDATIONS:
See paragraphs
2.08 Internal wall face works
2.09 Internal paint finishes

Countryside Consultants
Architects & Planners
Townhead, Alston, Cumbria. CA9 3SL Tel: 01434 381906
www.countryside-consultants.co.uk

Thornthwaite: St Mary,
Thornthwaite Cum Braithwaite
Cumbria

7. NORTH WEST NAVE INTERNAL WALL ISSUES



EXISTING FLASHING OVER DISABLED WC

The dampness in the WC could be entering from the core of the original wall above.

HIP TILES TO THE EXTENSION

These are cracked and should be replaced with grey clay hips to match those of the vestry.

FURTHER INVESTIGATION

Access roof void over WC to see if the are any clues as to where the moisture is coming from. If there is condensation occurring consider improving the ventilation of the roof void. If the dampness is coming in from the church wall install a cavity tray into the masonry wall over the lead flashings of the extension.

A: A slate has been lost in this location.

B: Debris in the valley gutter.

C: Swollen door requires adjustment by joiner.

D: Plasterboard on 'dot and dab' with pattern staining caused by dampness.

E: Plasterboard ceiling also showing signs of damp and mould.

F: Shadow of camera lens this is not a damp stain!

RECOMMENDATIONS:

See paragraphs

2.01 Initial repair works required this spring.

2.07 Masonry pointing to other elevations.

Countryside Consultants
Architects & Planners
Townhead, Alston, Cumbria. CA9 3SL Tel: 01434 381906
www.countryside-consultants.co.uk

Thornthwaite: St Mary,
Thornthwaite Cum Braithwaite
Cumbria

8. ISSUES IN AND AROUND THE DISABLED WC

APPENDIX 2
RECORD OF FLOODING DECEMBER 2015
Taken at 13:00 hrs on the 5 December 2015 by the Reverend Peter Vivash.

1.0 PHOTOGRAPHS

Photo 1: Taken from approximately 50 metres from the church on the access road from the west. The Church Beck water course has flooded into the field to the south west of the church.

Photo 2: Taken from the access road looking at the car parking area. Church yard boundary wall on the left. The car parking area and the field south west are flooded.

Photo 3: Car Park area looking back towards the location of Photo 2.

Photo 4: Car park area looking south west with flooded field beyond the beech hedge.

Photo 5: Car park area looking south east towards the bridge over Church Beck.

Photo 6: Car park area looking north east towards the church. Flood gate 'A' and church wall are holding the water back well. Later the water rose to approximately 50mm above the top of the flood gate. The water level when the photo was taken is estimated as 80.60 metres which is approximately 800mm above the floor level of the church. At the maximum level the water would have been nearly 1000mm above the floor level of the church.

Photo 7: Taken from the doorway of the kitchen extension looking west. The Church Beck (between the two wire fences) is running at an approximate level of 79.70 metres. This is roughly 70mm below the floor level of the church. The water over the farm track is at about the same level as is the water in the church yard. This can be seen in the photo running across the paving flags of the access path. These flags are set at the same level as the church floor to enable disabled access.

Photo 8: Looking north west from the boundary wall to the south west of the nave. All water levels as noted below photo 7.

Photo 9: As photo 7 but looking south west. All water levels as noted below photo 7.

Photo 10A

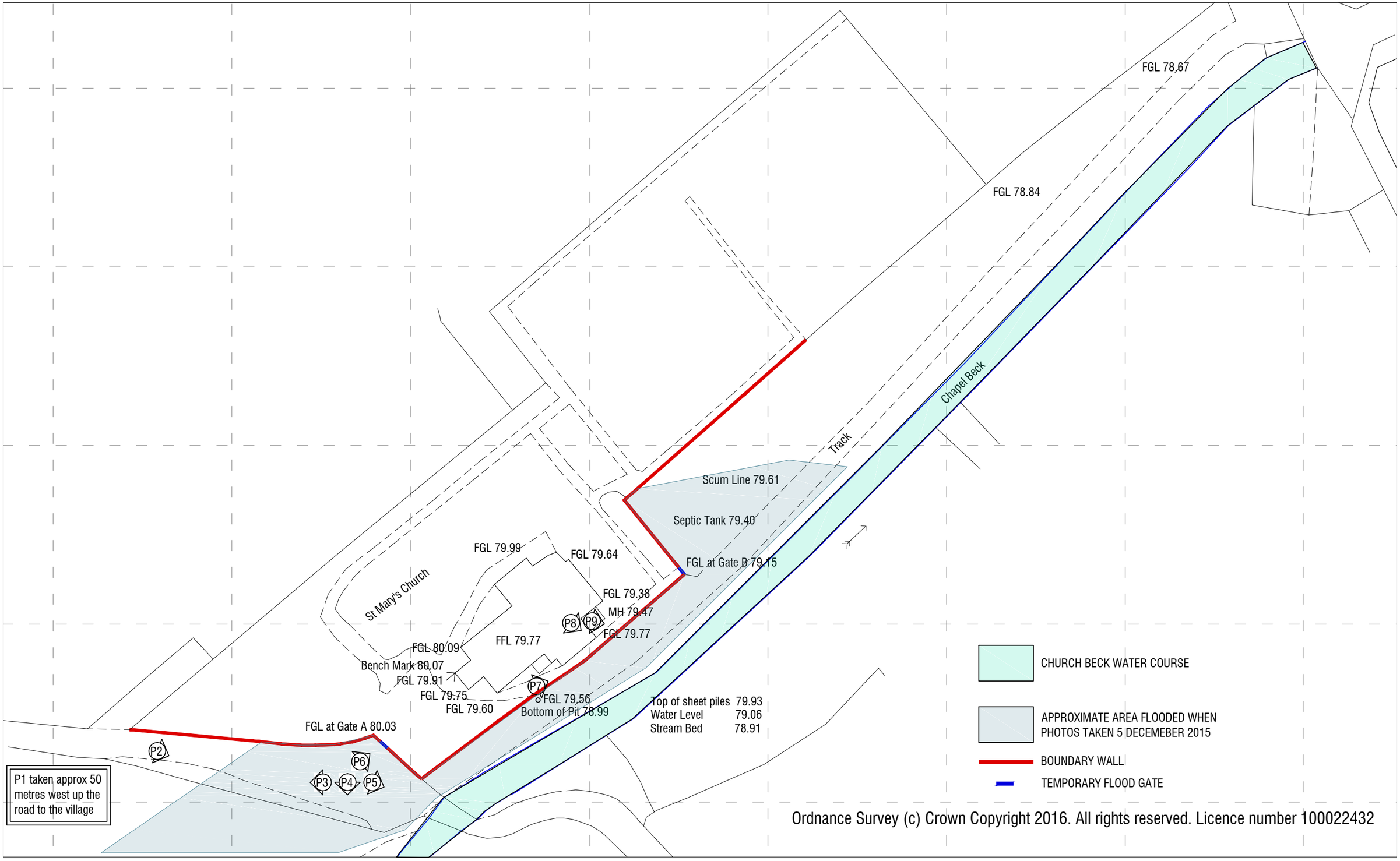
Photo 10B

The trial pit was dug on the 12 January 2016 in the verge of the farm track. The location is indicated on drawing S1. The level of the base of the pit was 78.99. This was just below the water level of 79.06 in the Church Beck water course.

When one considers that this area flooded to approximately 100mm above ground level on the 5th December and significant rain had fallen in the intervening six weeks the soil was remarkably dry. The soil was very granular, possibly an alluvial deposit, with a free draining character. Even after being open for approximately an hour the pit showed no indication of being below a water table.

2.0 Site Plan

Drawing no: 16 01 S1



0 10 metres 20 metres 30 metres 40 metres 50 metres

N

Countryside Consultants
Architects & Planners
Townhead, Alston, Cumbria, CA9 3SL Tel: 01434 381906
www.countryside-consultants.co.uk

St Mary's,Thornthwaite

SITE AS EXISTING

Job no:16 01 Date: 11/01/2016

Dwg no: S1

Scale: 1:500 at A3