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LIMITED STRUCTURAL ASSESSMENT REPORT OF ST. JOHN THE BAPTIST CHURCH COLD OVERTON LEICESTERSHIRE

Client: The Reverend Canon Jane D. Curtis
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Oakham Road
Tilton-On-The-Hill
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Architect: Mark Stewart Church Architect
16 Hillcrest Drive
Loughborough
Leicestershire LE11 2GX

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APPENDICES:

1.0 Introduction and Clients Brief

1.1 Following submission of a fee quotation, we have been requested to visit and inspect both the south porch and the tower to St. John the Baptist Church, Cold Overton, Leicestershire on behalf on the Parochial Church Council.

1.2 The report is required in relation to movement which has occurred to both the south porch and the tower and in relation to a Heritage Lottery Fund Grant application and associated assessment by Historic England.

1.3 We have been provided a copy of Mark Stewart Church Architects quinquennial report, dated 2016, which highlights the movement to the two areas.

1.4 The Church was visited on Monday 3rd April 2017, with the weather at the time being fine and sunny and the temperature being around 2 degrees Celsius at the beginning of the survey.

1.5 For the purpose of the survey, the Church is considered to be orientated with the tower at the west end and with directional notations taken in relation to this.

2.0 Brief Description

2.1 The Church (see photograph 1) is Grade I listed of special architectural or of historic interest, with the list description taken from Historic England's Heritage List for England listing repeated below, although these listings are not always accurate.

> *Parish church. C13, C14, C15, and c.1800. Restored by J. T. Micklethwaite, 1889. Coursed and squared ironstone and limestone rubble and ashlar, with ashlar dressings. Lead and Swithland slate roofs. Moulded and chamfered plinths, sill band, some coved eaves. Openings mainly have hood moulds and mask stops. West tower with spire, nave with clerestory, north aisle, chancel, south aisle, south porch. Tower, C15, 2 stages, has clasping buttresses, those to west with masks on the plinth. 2 chamfered and moulded string courses and toninuous hood mould. Coved eaves with masks, crenellated parapets with 4 pinnacles. Setback octagonal spire with finial and weathercock plus 2 tiers of gabled lucarnes with double lancets. First stage has to west, blocked moulded doorway and above it, C15 double lancet with panel tracery. Second stage has 4 transomed cusped double lancets. To east, clock. Clerestory, 3 bays, has chamfered band and crenellated parapet with south-east corner and gable pinnacles. Rainwater heads to north inscribed 'J B 1804' and to south 'W S 1793'. On each side, 3 round headed double lancets with moulded pointed openings. North aisle, 2 bays, has to north 2 buttresses. West end has C19 chamfered single lancet. North side has to east, C15 triple lancet with moulded elliptical head. To west, chamfered C13 blocked door. East end hasa restored round headed moulded window. Chancel, 2 bays, has moulded plinth and coped gable with cross. North side has central buttress, 2 setoffs. To west, C14 double lancet with flowing tracery, and to west again, C13 single lancet low side window. East end has angle buttress to right and single buttress to left, 2 setoffs. Restored C14 reticulated triple lancet with coved and chamfered reveal. South side has central buttress, 2 setoffs. To west, C13 foiled single lancet low side window. Above and to east, 2 restored C14 double lancets with flamboyant tracery. South aisle, 3 bays, has 2 pairs of double gabled angle buttresses with crocketed pinnacles. Chamfered and moulded plinth and sill band. Rainwater head inscribed 'J M 1795'. East end has C14 double lancet with flamboyant tracery and coved reveal. South side has to east of porch, C14 ogee headed triple lancet with intersecting tracery. West end has late C18 untraceried chamfered triple lancet with coved reveal. South porch has 2 diagonal buttresses and moulded coped gable incorporating restored sundial. C14 double chamfered doorway with octagonal shafts and capitals. Interior has 2 stone benches, C19 common rafter roof and re-set C16 chamfered span beam and boss. Early C13 moulded round headed doorway with fillets, double ringed shafts with leaf capitals, and hood mould with fleurons. C17 framed and panelled door with late C18 panelled furniture.*

Double chamfered C13 tower arch has octagonal responds and stiff leaf and crocketed capitals, and hood mould. Early C13 north arcade, 2 bays, has round piers and responds with water holding bases and stiff leaf capitals. Moulded arches with keeled and filleted roll mouldings. Similar, plainer south arcade, mid C13, has responds with nailhead. C19 principal rafter roof with restored mask corbels. North and south aisles have C19 roofs with arch braces on re-set corbels. North aisle has blocked doorway and stained glass east window c.1920. To its right, arched moulded C19 fireplace with crest in roundel. South aisle has to east, foiled moulded piscina with damaged hood mould. Above, remains of C14 wall paintings and window with fragments of C14 stained glass. West end has re-set cross shaft in window sill. Memorial chapel at west end has 3 bay Classical wooden screen with central double doors and metal bars. Chancel has early C14 double keeled and filleted moulded arch with hood mould and octagonal responds with moulded capitals. Early C20 Perpendicular style traceried oak screen. North side has to east moulded C13 blocked doorway and to its right, small aumbry. East end has Perpendicular style altar, reredos, wall panels and candlesticks, early C20, and stained glass window, 1926. South side has damaged fillet moulded C13 piscina and similar triple sedilia, both with hood moulds. Eastern and low side windows have C15 stained glass fragments. Low pitched C19 roof with cambered tie beams, bosses and arch braces on plain corbels. Fittings include linenfold panelled oak desks, pulpit, lectern and stalls, c.1918. Plain C19 benches. Fluted font on baluster stem, 1842. C18 chest with bracket feet. Wardrobe, 1893, assembled from former roof timbers. Memorials include large pedimented Classical marble tablet by W. G. Nicholl, 1829, with brackets carrying cushion and inscribed open book. Re-set slate tablet with painted heraldry to John Turner, 1753. Slate tablet to Selina Frewen, 1784. Corniced marble and slate tablet, 1791. 3 mid C19 marble and slate tablets to Frewen-Turner family. Marble and slate tablet, 1879. Painted slate tablets signed 'Burton' 1819 and 1832. Brass, 1866. Green stone cross, 1911.

2.2 The Church appears to have been started in the 13th century and with a number of subsequent extensions and alterations, so that the building now comprises a nave, chancel, north and south aisles and a south porch. A plan, taken from the Architect's quinquennial report, is appended to this report.

2.3 It is constructed of a masonry, being predominately ironstone and limestone rubble with ashlar dressings and a timber lead clad roofs (see photograph 2).

2.3 The tower at the west end has a stone spire and is dated to the 15th Century and is of two stages with buttresses (see photographs 3 to 6).

2.4 The porch is also 15th Century with stone benches to both sides and constructed around the fine doorway with a timber pitched roof over with lead covering (see photographs 7 to 10).

3.0 Structural Survey Detail

3.1 <u>South Porch</u>

3.1.1 It is quite clear that there has been movement to the porch historically with both the east and west walls leaning out slightly in their height. This was confirmed with a 1.2-metre-long spirt level, which suggests 30mm out of plumb to the west wall and approximately 15mm to the east side, then with the south wall also leaning southwards up to 50mm in the south west corner.

3.1.2 This movement has manifested itself in cracks running up the abutment of the south wall and west wall (see photograph 11) and then also to the same junction to the east side which had moved across into the south wall (see photograph 12). The cracks are between 5 and 10 mm wide and more obvious internally due to the plaster finishes which have been applied. The plaster appears relatively recent and probably dates to the second half of the 20th century, thus suggesting some movement since that time.

3.1.3 Externally there is no significant evidence of any movement and with the whole structure having been repointed, we suspect in relatively recent times (perhaps in the last 20 years). The mix and style of pointing suggest a conservation based approach, particularly in relation to the crack that had been exposed in this and it does appear to be a lime based mortar, but perhaps with cement additive.

3.1.4 A deep surface water channel has been constructed around the east side of the porch (see photograph 13), which then continues around the aisle and chancel and also collects rain water from the roofs. There is a gully at the south end of the section alongside the porch, however the brickwork forming the collection channel is open jointed and thus, will be allowing water to leach through into the sub-soils alongside the porch. It was also noted that there is a significant yew tree within around 5-6 metres of the porch to the south (see photograph 14).

3.1.5 It was noted to the south-east corner buttress that it is predominately dressed limestone to two thirds of its height and then changes to ironstone. Interestingly, there is an apparent levelling course applied between the two, suggesting some rebuilding at some point to the upper portion (see photograph 15). The levelling stone suggests movement had already taken place by this time.

3.1.6 There is no surface water drainage detail to the west side and the rainwater from the south aisle (see photograph 9) is collected in a water butt, although this is full and excess water probably saturates the ground from the overflow alongside the aisle and porch.

3.1.7 Obviously both surface water and gullies can cause local issues of water saturation to the sub-soil below foundations and which may affect movement. This can be aggravated by nearby trees, in this case the yew, drawing further moisture from the ground.

3.1.8 However, at this time there is no evidence of any recent movement externally or to suggest ongoing issues of movement.

3.2 Tower

3.2.1 It is quite evident inspecting the tower that there has been a history of movement of this and other parts to the Church as is not unexpected for a building of this type and age which has evolved with time.

3.2.2 It can be seen that the west end of the south aisle has clearly settled towards the south, with this obvious to both the string courses window and also the out of plumb of the south wall (see photograph 16). This was measured on the buttress as approximately 50mm in a 1.2 metre height. The upper portion of the west gable appears to be a rebuild judging by the different masonry and in fact, this is a coursed relatively horizontally (see photograph 17), suggesting that this was undertaken after the majority of the movement had taken place.

3.2.3 To the north end of the west wall on the south aisle, there is a setback section of masonry where it abuts the tower and this is where the face work is not coursed through with this i.e. suggesting a construction joint (see photograph 18). There is pointing between the two in a more recent mix but no opening up has occurred to indicate recent movement.

3.2.4 Looking at the west elevation of the tower, there is quite clearly some settlement of the structure towards the north, as seen in the plinths and string courses etc. There may also be some out of plumb movement to the tower towards the south which has resulted in cracks running up the tower face, particularly between the main west window and the belfry window (see photograph 19), above which have been pointed and in some places with tile slips inserted and with no significant re-opening.

3.2.5 At ground level, there is some minor evidence of opening up with these cracks, but not of a significant nature. This movement is more difficult to read above the belfry window and towards the parapet, partly due to the nature of some of the ironstone blocks which have decayed to the face and the height above ground level.

3.2.6 To the north elevation, it appears there may be some movement towards the west, with some out of plumb. However, there is no evidence of this affecting the junction with the nave and clearstory walls. The elevation appears in reasonable condition, although the belfry opening and tracery appears slightly twisted and above the window. The ironstone makes reading movement more difficult. There are occasional open joints below the belfry string course.

3.2.7 The east facing elevation of the tower is above the main roofs and thus, only a limited inspection was possible. From this view, the structure appears in reasonable condition.

3.2.8 Following the visual inspection from ground level, the elevations were then inspected by binoculars, with some minor further damage noted to the south elevation in the form of open joints and which repeats to the west elevation. These seem to suggest that the movement lines seen at lower level do gently follow up above the window through to the parapet etc.

3.2.9 Internally, within the tower at belfry level, there is a ring of three bells, with the larger two swinging north south and the upper one east west (see photograph 20).

3.2.10 Access was possible to the small gutters around the spire at the head of the tower, which has been flaunched in concrete. It was possible to view up the outside of the spire, with no particular evidence of any significant structural movements noted (see photograph 21).

3.2.11 Looking over the parapet wall edges, it was possible to see some open joints to the parapet and below (see photograph 22).

3.2.12 Internally, you can view up the spire and see a ‘cross-tree’ built in at one level (see photograph 23) and perhaps with the plate on the underside of the solid tip, although the latter was not confirmed. There were no significant signs of problems structurally, although there are clear eroded joints with some local decay of stone.

3.2.13 At belfry stage the tops of the towers walls were seen, but which is limited by the clock mechanism. The walls have been repointed and do not show any particular signs of any joints opening (see photograph 24).

3.2.14 The lower level of the towers internally are largely plastered, although the plaster to the south side is failing towards the head (see photograph 25). There are some minor cracks above the west facing window and door arches, but these are nominal and do not evidence any recent movement.

3.2.15 Looking from the nave towards the east wall of the tower, the overall movement that has occurred to the tower is apparent with both the north aisle arcading leaning north and the south aisle arcading leaning south.

3.2.16 There is disruption over the tower arch into the nave with heavy cement repointing (see photograph 26) with no evidence of any new or recent opening up as seen from ground level.

4.0 Conclusions and Recommendations

4.1 Geological maps from the British Geological Survey suggest that the Church is probably founded within sands and gravels, although it is close to the boundary with clays mixed with sands and gravels. A historic borehole to the east of Cold Overton Hall (1914) suggests clay down to 14 feet and then underlain middle lias sandstone and clay below.

4.2 Both the south porch and the tower have clearly suffered from historic movement. With elements of buildings which are added, this is not unusual and relates to construction settlement of these parts as they compress the virgin subsoils below their foundations. This is particularly so with towers and the sheer weight and mass of these.

4.3 There are examples around the church of subsequent 'rectification works' to address this. This includes levelling courses, as seen to both the south-east buttress to the porch and also the head of the west gable to the south aisle. These are useful as they clearly identify movement is not recent in nature. Of course, this does not mean that no further movement will take place in the future.

4.4 With regards to the south porch, there is clearly movement of a more recent nature which can be dated to post the application of the internal plaster, but I would describe this movement as minor in nature and is clearly not evident externally, which appears to have been repointed post the internal plastering. This certainly provides comfort that no recent movement has occurred.

4.5 Following any initial construction settlement, likely causes for more recent movement could relate to subsoil conditions, which may be clay and thus, with the potential for shrinkage and swelling, and then possibly aggravated by the nearby yew tree and also the surface water drains and associated gullies.

4.6 Certainly, it would be sensible to ensure that the gullies are working correctly to help transport water away. This applies also to the west side where the rainwater butt appears to overflow on to the ground and ideally, this needs to be managed to remove this further away from the Church, or a gully put in to take the water away.

4.7 With regards to the tower, there is no evidence of any recent or significant movement. The most predominant crack is to the west elevation and to a lesser extent the east elevation. That to the west has been repaired with tile slips and pointing in the past. The west elevation has openings at three levels, whilst the east has the high tower arch internally and window above, and this these elevations inevitably form weaknesses around which the tower will articulate. I suspect some of this occurred during and soon after construction as the tower settled down on its new foundations.

4.8 There are other cracks and I suspect additional open joints will be found as part of the works when high level access is available.

4.9 Of course, once cracks have formed they tend to be positions about which future movement occurs. This may have been aggravated by some bell action, with the two larger bells swinging in the north south direction, i.e. imparting a dynamic action to the weaker east and west walls.

4.10 However, there is nothing to suggest recent movement and the recommendation is simply to repoint and make good these cracks, which will then act as a future tell-tale which should be reviewed as part of quinquennial inspections.

5.0 Limitations

5.1 It should be stated that we have not inspected woodwork or other parts of the structure unless specifically detailed in the report, which are covered, unexposed or inaccessible and we are therefore unable to report that any such part of the property is free from defect.

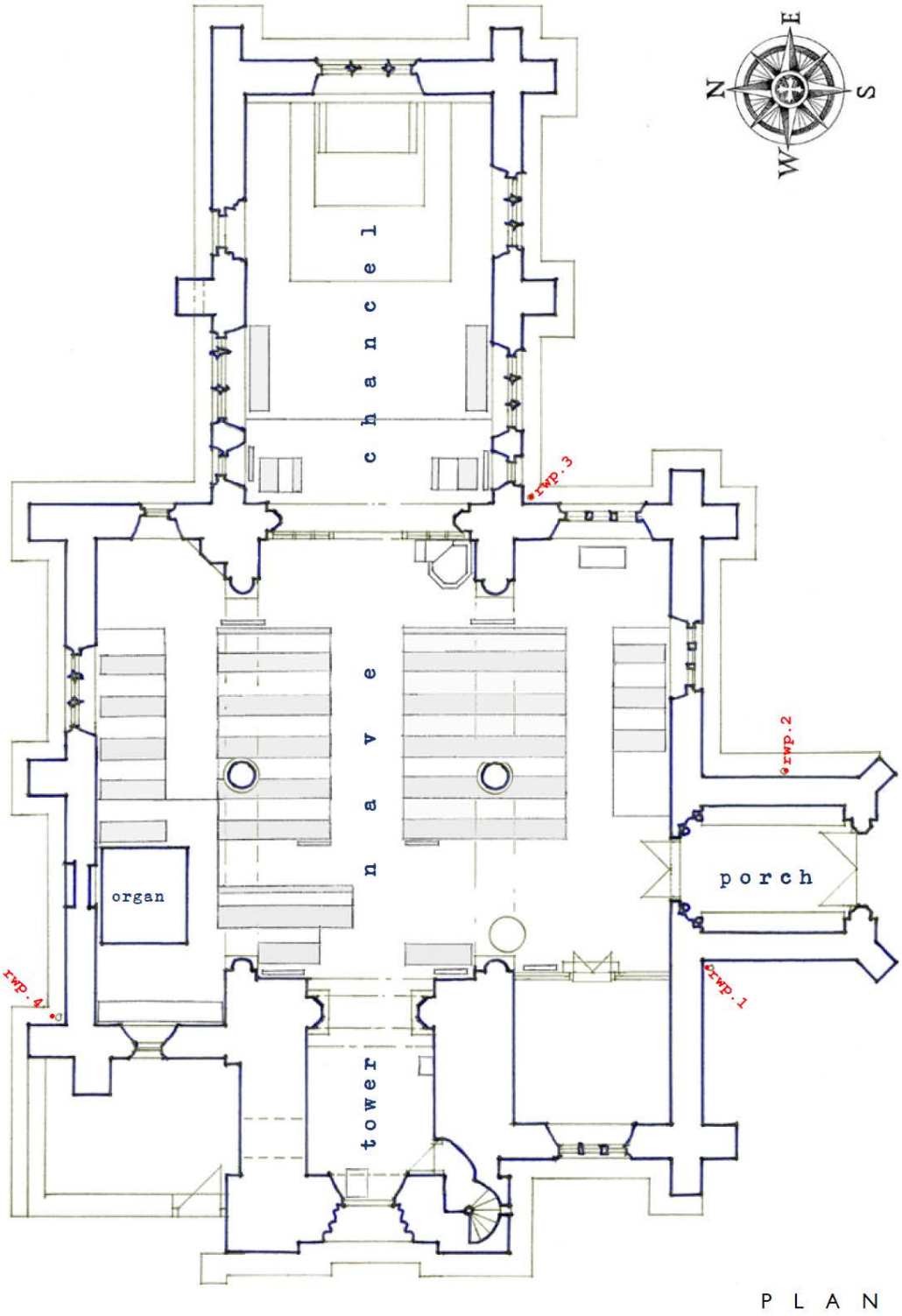
5.2 This report has been carried out to the Client's requirements and no liability is intended or will be accepted from any third party whatsoever.

5.3 The limits of liability are restricted to the contents of this report. No opening up or investigation of foundations etc was carried out, the inspection being visual only.

5.4 No checks on load bearing capabilities have been carried out.

APPENDIX A

Plan



PLAN TAKEN FROM MARK STEWART QUINQUENNIAL (NTS)

APPENDIX B

Photographs

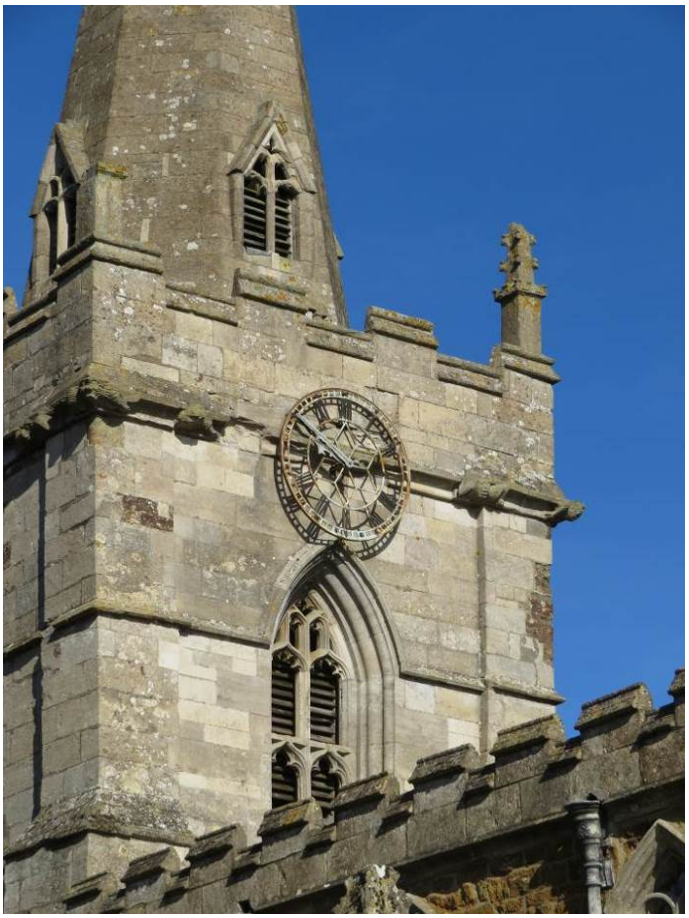
Photograph 1: View of church from south east

Photograph 2: View down from tower over Nave, Chancel and Aisle roofs

Photograph 3: South elevation of tower and spire

Photograph 4: West elevation of tower and spire

Photograph 5: North elevation of tower and spire



Photograph 6: East elevation of tower and part spire

Photograph 7: East elevation of porch

Photograph 8: South elevation of porch

Photograph 9: North elevation of porch

Photograph 10: South wall of porch internally

Photograph 11: Crack to east wall of porch

Photograph 12: Crack to east side of door arch to porch

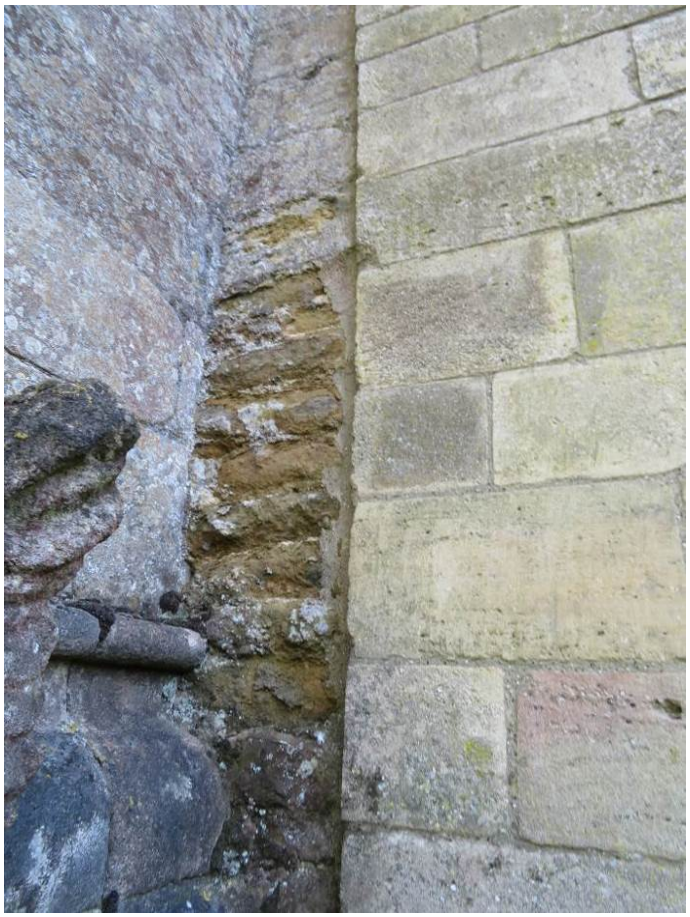
Photograph 13: Drainage collection channel to east side of porch

Photograph 14: Yew tree to south of porch

Photograph 15: Ironstone re-building over limestone to porch with levelling course highlighted

Photograph 16: Settlement of the west wall of the south aisle is obvious

Photograph 17: Re-build to head of gable and which is relatively horizontal



Photograph 18: Set back section of masonry with pointing at joint not re-opened

Photograph 19: Crack to west elevation of tower with tiles slips used (highlighted)

Photograph 20: Part view of bell frame with two larger bells swinging north south

Photograph 21: View looking up spire which appears in reasonable structural condition

Photograph 22: Open joints parapet as seen from the tower gutters

Photograph 23: View up spire with cross tree apparent and highlighted

Photograph 24: Pointed walls to head of tower

Photograph 25: Plastered walls to lower stage of tower with failure to high level south wall

Photograph 26: West face of tower with door and window

Photograph 27: Minor cracks over west door arch

Photograph 28: Internal face of east face of tower with cement pointed cracks