HORNCASTLE CEMETERY CHAPEL **Project No. 6013**
DRAFT COPY – FOR COMMENTS

TOWER REPAIR WORKS

PRELIMINARIES & GENERAL CONDITIONS

G1 NAME OF PARTIES:

EMPLOYER: Horncastle Town Council
Town Council Office
The Stanhope Hall
Boston Road
Horncastle
Lincolnshire
LN9 6NF

Contact – Amanda Bushell, Town Clerk
01507 522957 / info@horncastletowncouncil.co.uk

CONTRACT ADMINISTRATOR /
SUPERVISING OFFICER (S.O.) /
PRINCIPAL DESIGNER:
York Sills Ltd
Unit 5 Checkpoint Court
Sadler Road, Lincoln
LN6 3PW

Contact – Robert Webster
01522 690815 / bob@yorksills.co.uk

G2 DESCRIPTION OF THE WORKS:

The building is a Victorian cemetery chapel. Suspected corrosion of embedded metalwork has occurred in the masonry supporting the spire. The embedded ties and tie rods are to be replaced with stainless steel and the stonework is to be repaired using indent repairs and new stonework as appropriate. In order to access the stonework for repair it will be necessary to lift or remove the tiled timber spire construction temporarily. Reference should be made to appended York Sills inspection report letter dated 26th April 2018 and drawing 6013/01.

G3 CONDITIONS OF CONTRACT:

The Conditions of Contract will be the JCT Agreement for the Minor Building Works, 2016 Edition. A draft Contract is included within the Tender Documents. All Contract Conditions are still deemed to apply unless otherwise varied and agreed in writing.

G4 ACCESS TO SITE:

The site is located at OS Grid Ref TF263686. Vehicular access is off Boston Road in Horncastle. Reference should be made to appended York Sills drawing 6013/100 for the general layout of the site. Adequate parking is available on the site.

The Chapel will not be in public use during the works but the grounds staff will regularly access the building so clear access must be maintained for the Employer. The Contractor will only need to access the building for installing, removing or inspecting scaffolding and may not use it for storage, etc.

The Employer will provide the contractor with as set of keys for access to the site and all required places. During funerals or processions we would request that any disruptive works be paused. **The Contractor will be given as much notice as possible subject to a minimum of a week's notice prior to any funerals, processions or interments** which take up no more than half a day.

Electricity and potable water are available to the Contractor free of charge in the shed indicated on York Sills drawing 6013/100. The Contractor must ensure that the supplies are adequate for their requirements or else provide their own.

The Contractor is to liaise with the Employer to determine the exact limits of permissible parking areas, compound areas and access. Access to the internal areas of the chapel for inspections is to be provided by Stuart Goodacre (Mobile: 07899737979) the groundskeeper for the site.

G5 TERMS OF PAYMENT:

The Employer is ultimately responsible for all contract costs and payments. The Contractor is to submit a monthly valuation to the SO for approval and onward transmittal to the Employer for payment.

G6 SAFETY AND WELFARE:

The Contractor shall ensure that all safety and welfare facilities required under or by virtue of the provisions of any enactment or regulations or the working rules of the industry are strictly complied with. This is to include the responsibilities under the Construction (Design & Management) Regulations 2015 under which he will be appointed Principal Contractor. The Contractor will be responsible for providing a Construction Phase Plan.

G7 WORKING PRACTICE:

The Contractor is to agree all working hours with the Employer prior to starting on site. Working hours for the site are unregulated due to the chapel being closed for the duration of the work. Although allowance should be made for funeral precessions.

Noise should be kept to a minimum wherever possible with power tools not too be used prior to 8:00am and after 5:00pm due to close proximity to neighbouring houses

G8 TEMPORARY WORKS:

The Contractor is to be responsible for all temporary works deemed necessary for the safe execution of the construction works. Prior to commencing works on site the Contractor is to prepare a schedule and details of his proposed temporary works for approval by the Supervising Officer. These proposals should be submitted at least five working days prior to the commencement of the works so that the Supervising Officer may

comment/amend/approve the proposals as necessary.

G9 PROTECTION:

The Contractor is to ensure that the access road and footpaths, boundary walls, fences etc., in the vicinity of the site and all footpaths and driveways on the site are protected at all times when being used for access. Any damage occurring as a result of lack of protection during these times will be the responsibility of the Contractor and consequently all repair works will be at his expense and must be to the approval of the Supervising Officer and/or any related Statutory Authority.

G10 CONTRACTORS WORKING STORAGE AREA:

The areas required for access to the works and for material and equipment storage are to be agreed with the owner/Employer prior to commencement of the works. Any such areas must be kept neat and tidy to ensure access to other areas of the property at all times. The areas must be protected and any and all damage caused by material storage etc., is to be repaired on completion. The area between the cabin and shed is available for storage (refer YS drawing 6013/100).

G11 CLEANING THE SITE:

The site should be kept as clean and tidy as is reasonably practicable during the works. At the end of the contract the Contractor is required to clean the site and ensure that it is in a tidy condition. All waste materials, equipment, temporary huts and stores must be removed from the site.

G12 SUBCONTRACTORS - ASSIGNMENT:

Due to the specialist nature of some parts of the works, subcontractors may be used for such sections. Any such subcontractor must abide to all terms and conditions of the contract. Total assignment of the works will not be permitted unless agreed in advance with the Employer and Supervising Officer.

G13 SUPERVISION:

The Supervising Officer is to be allowed access to the site during normal working hours to inspect the workmanship as work progresses. This does not relieve the contractor of any such responsibilities for his own supervision of the work and the general standard of workmanship, etc., required. In addition, all reasonable access shall be provided for the Local Authority Building Inspectors and/or any other supervisory party appointed.

G14 INSURANCE:

The Contractor is to include for and provide all insurances required by the Conditions of Contract including Joint Names Insurance of the Works by Contractor (Clause 5.4). Insurance is to be discussed between the contractor and Horncastle Town Council once the contract is awarded.

HORNCASTLE CEMETERY CHAPEL **Project No. 6013**
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SCHEDULE OF WORKS

The following schedule is for guidance only. The items given are not necessarily intended to be an exhaustive list of the works required nor indicative of any specific sequence of works. Any quantities quoted are approximate, the tenderer is to be solely responsible for visiting the site to determine the extent and requirements of the Schedule of Work and for taking his own measurements.

Any additional items not listed below or elsewhere but considered of sufficient importance by the Tenderer to be included, should be added in the space provided or on supplementary sheets. All items should be priced, any items not priced will be considered to be included elsewhere and to be insignificant for the purpose of the Final Account.

SCHEDULE OF WORKS - SUMMARY	**£**	**p**
Section 1 - General Items	6,660	00
Section 2 – Daywork	885	00
Section 3 – Preparation for Repairs	23,420	00
Section 4 – Stonework Repairs	14,920	00
TENDER TOTAL	45,885	00

Signed .....……

on behalf of ...Clarke Group Construction Ltd…… (Tenderer)

****

PROGRAMME - (Tenderers to complete as applicable)

Anticipated duration of works 10 ***weeks***

Mobilisation time from receipt of order/instructions 8 ***weeks***

****

		£	p
1.0	**GENERAL ITEMS**		
1.1	Fixed preliminary costs, insurance etc.		
1.2	Allow for all necessary measures to comply with general Health & Safety requirements and specifically the Construction Design & Management Regulations.	1,560	00
1.3	Site establishment, protection of access etc.	1,200	00
1.4	Locate, identify and protect all services, drainage, gas, electric, water, central heating etc., in the vicinity of the works. If necessary, inform Employer and disconnect locally. Reinstate on completion.	1,000	00
1.5	Main Contractor to conduct their own dilapidation survey prior to any work starting and provide Employer and Supervising Officer with photographs on USB drive. Main Contractor to the conduct dilapidation survey after all work has concluded to check that no damage has occurred as a result of the works.	600	00
1.6	Clean up and tidy site on completion, including reinstatement of all storage areas, access etc.	1,800	00
1.7	Contingency Sum - Provide sum of **£500** for unforeseen items to be expended only at the discretion and under instruction from the Supervising Officer. (Any sum not so spent to be deducted from the Final Account).	500	00
	Carried to summary	6,660	00

		£	p
2.0	**DAYWORK**		
2.1	LABOUR: *Include Provisional Sums for:*		
	Prime cost of 4hrs skilled labour incurred before Final Completion Date:	80	00
	Add for percentage adjustment 100 %	80	00
	Prime cost of 4hrs skilled labour incurred after Final Completion Date:	80	00
	Add for percentage adjustment 100 %	80	00
2.2	MATERIALS & GOODS: *Include Provisional Sums for:*		
	Cost for 2No. 300x300x300 Ancaster Hard White supply only	240	00
	Add for percentage adjustment 25 %	60	00
	Cost for 2No. 150x75x75 indents Ancaster Hard White supply only	212	00
	Add for percentage adjustment 25 %	53	00
	Carried to summary	885	00

3.0 PREPARATION FOR REPAIRS	**£**	**p**
3.1 Provide working/propping scaffold as required including back-propping into chapel if necessary. Include for Temporary Works Design to allow for propping/jacking.	16,480	00
3.2 Strip slate and lead from tower if necessary and retain for re-fitting. Unbolt tie bars and cut rafter overhang notches and retain if required to allow spire to be jacked.	2,460	00
3.3 Install needle beams and necessary timber packs, etc. to support spire in temporary condition. Jack up approximately 300mm to provide access to stonework. Ensure spire on all faces is fully supported and stable prior to commencement of works.	4,480	00
Carried to summary	23,420	00

		£	p
4.0	**STONEWORK REPAIRS**		
4.1	Stage 1 – Refer drawing 6013/01 for repair details which should include for the following as a minimum: i. 4 linear metres of 150x100 indent repairs to top outer face of arch blocks ii. Replacement 450x100x100mm corbel piece iii. Additional 0.5 linear metre of 100x50mm indent repairs to arch blocks where erosion exceeds 25mm depth Replace tie rods with 20mm diameter stainless steel bars resin- fixed into the spire base. iv. Rebuild the upper level of stone columns with repaired stone in NHL5 mortar. Replace all existing embedded metal cramps with stainless steel (details TBC when exposed) v. Remove needles and propping, re-tile spire, re-fix rafter overhang notches around stonework. vi. Site clear-up, make good compound and parking.	14,920	00
4.2	List and include for any other types of repair details which might be considered necessary further into the project.		
	Carried to summary	14,920	00

SPECIFICATIONS

(1) The Contractor is to provide all materials, tools, plant and equipment, required for the safe execution and satisfactory completion of the Contract. All materials are to be as specified unless otherwise approved in writing by the Supervising Officer. Any and all materials and tools used for the works shall be of good quality and suitable for their intended use.

(2) Any and all works shall be undertaken by suitably qualified and experienced operatives and completed to a standard appropriate to the requirements of the project.

(3) Where a Specification or Code of Practice or Building Regulation issued by the British Standards Institution or a Government Department is current at the date of the tender and is applicable, the works, goods, materials and services used in the Contract shall, as a minimum, be in accordance with the relevant requirements of that Specification or Code of Practice or Regulation.

(4) New Stonework & Mortar: -

a) All repair/replaced stone work and mortar must be like for like to the standard of the existing building. A similar like for like locally sourced limestone should be used for the replacement stonework. NHL5 lime-based mortar to be used with constituents and colour to match existing. A mortar sample should be taken from the existing building to achieve best match.

Note: A sample mortar shall be undertaken, as early as possible after commencing on site so that the drying colour change can be seen and the mix colouring adjusted if necessary to provide an acceptable match to the existing.

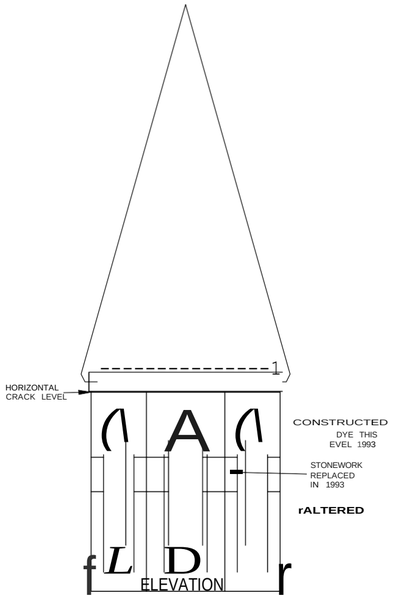
b) Replacing any damaged stonework with matching units. Ancaster Hard White is likely to be a suitable replacement stone to match the existing.

c) All replacement cramps and ties shall be minimum 2.5mm thick stainless steel flat bar or 5mm diameter stainless dowels bedded in lime putty or mortar.

APPENDIX 1

YORKSILLS DRAWINGS 6013/01 & 100
CHAPEL LAYOUT SKETCH

THIS DRAWING HAS COLOUR CODED INFORMATION AND IS INTENDED TO BE PRINTED ONLY IN COLOUR



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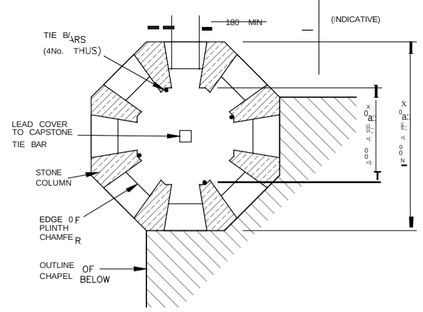
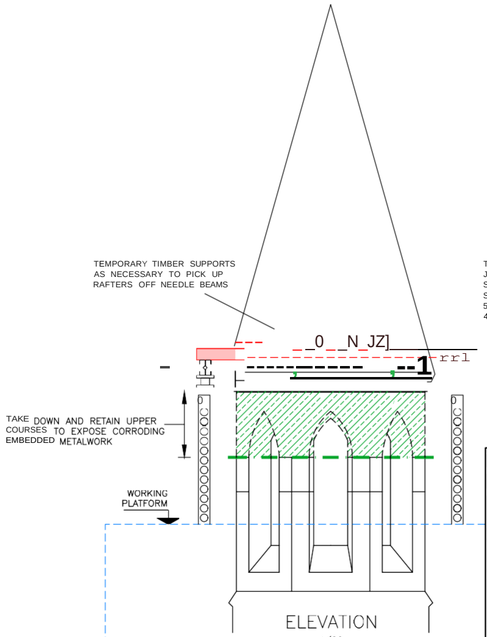


GENERAL ARRANGEMENT
EXISTING SPIRE
1/20



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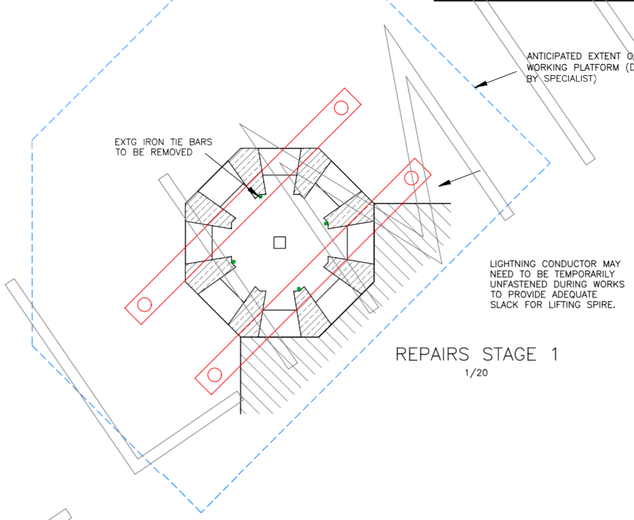
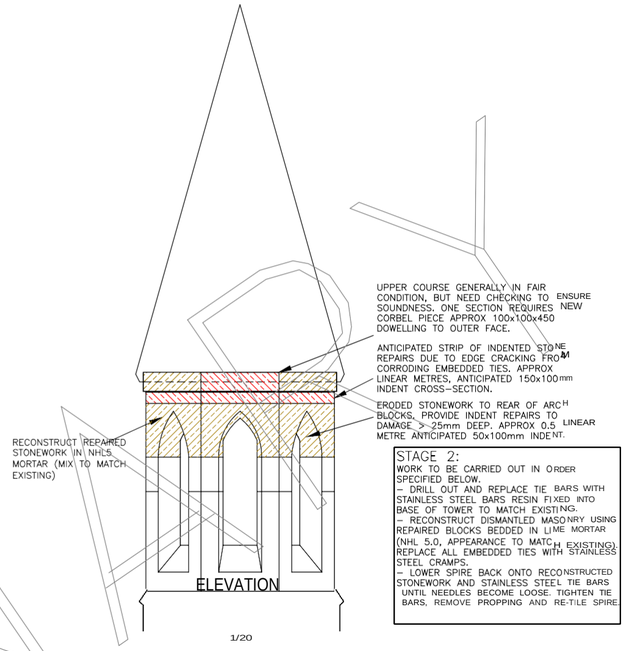
STAGE 1:
INDICATIVE METHOD STATEMENT (FINAL METHOD STATEMENT TO BE PREPARED BY MC AND SUBMITTED TO SO MIN 7 DAYS BEFORE COMMENCEMENT OF WORKS)

– INSTALL WORKING PLATFORM SCAFFOLD (DESIGN AND INSTALLATION BY SPECIALIST CONTRACTOR). NOTE BACK–PROPPING INSIDE THE CHAPEL WILL BE REQUIRED IF PROPPING OFF THE ROOF SLOPE.
– STRIP SPIRE ROOF, INSTALL NEEDLES AND JACKING PROPS. CUT RAFTER OVERHANG NOTCHES IF REQUIRED TO PERMIT SPIRE TO BE LIFTED VERTICALLY.
– RELEASE SPIRE BY UNBOLTING OR CUTTING OFF TIE BARS, THEN JACK UP APPROXIMATELY 300mm TO PROVIDE ACCESS TO MASONRY.
– TAKE DOWN UPPER COURSES OF MASONRY DOWN TO SOUND MASONRY AND SET ASIDE. ALLOW FOR INDENT REPAIRS TO CRACKED BLOCKS AS SHOWN PLUS CONTINGENCIES OUTLINED IN SPECIFICATION.



REPAIRS STAGE 1
1/20



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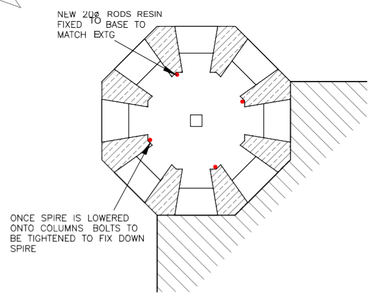
STAGE 2:
WORK TO BE CARRIED OUT IN ORDER SPECIFIED BELOW.
– DRILL OUT AND REPLACE TIE BARS WITH STAINLESS STEEL BARS RESIN FIXED INTO BASE OF TOWER TO MATCH EXISTING.
– RECONSTRUCT DISMANTLED MASONRY USING REPAIRED BLOCKS BEDDED IN LIME MORTAR (NHL 5.0, APPEARANCE TO MATCH EXISTING). REPLACE ALL EMBEDDED TIES WITH STAINLESS STEEL CRAMPS.
– LOWER SPIRE BACK ONTO RECONSTRUCTED STONEWORK AND STAINLESS STEEL TIE BARS UNTIL NEEDLES BECOME LOOSE. TIGHTEN TIE BARS, REMOVE PROPPING AND RE-TILE SPIRE.



REPAIRS STAGE 2
1/20

PRELIMINARY ISSUE
THIS DRAWING ILLUSTRATES DESIGN INTENT ONLY AND MAY BE SUBJECT TO CHANGE DURING FINAL DESIGN DEVELOPMENT

Rev	Revision	Drn	App	Date
P1	PRELIMINARY - FOR DISSCUSION	TR	RW	02/24

YORK SILLS LTD, 5 CHECKPOINT COURT, LINCOLN. LN6 3PW
01522 690815 www.yorksills.co.uk

Client
Horncastle Town Council

Project
HORNCASTLE CEMETERY CHAPEL
BOSTON ROAD, HORNCASTLE

Title
TOWER REPAIR DETAILS

Date	JAN 24	Scales @ A1	Drawing No.	Rev
Appr	RW	1:20	**6013/01**	P1

THIS DRAWING HAS COLOUR CODED INFORMATION AND IS INTENDED TO BE PRINTED ONLY IN COLOUR

SITE LAYOUT
NOT TO SCALE

CONTRACTOR CHECK LIST:

- INSURANCE DETAILS EXCHANGED BETWEEN CLIENT.
- GATE KEYS AND ANY OTHER ACCESS REQUIREMENTS EXCHANGED.
- CONTACT NUMBER PROVIDED.
- RELEVANT CONTACT DETAILS EXCHANGED FOR ISSUES ONSITE.

PRELIMINARY ISSUE
THIS DRAWING ILLUSTRATES DESIGN INTENT ONLY AND MAY BE SUBJECT TO CHANGE DURING FINAL DESIGN DEVELOPMENT

Rev	Revision	Drn	App	Date
PI	PRELIMINARY - FOR DISSCUSION	TR	RW	02/24

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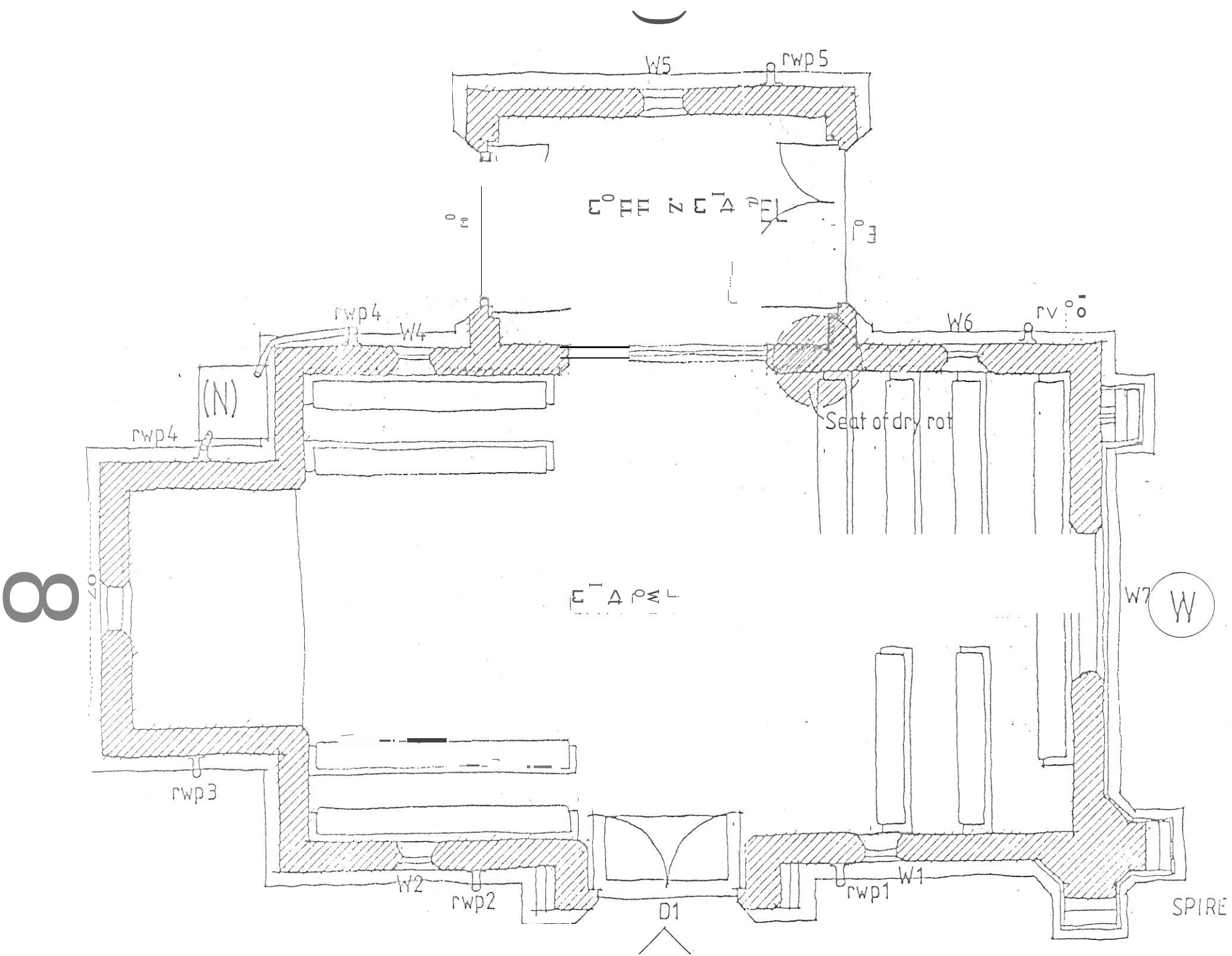
Client
Horncastle Town Council

Project
HORNCASTLE CEMETERY CHAPEL
BOSTON ROAD, HORNCASTLE

Title
SITE PLAN

Date	JAN 24	Scoles @ AI	Drawing No.	Rev
Appr	RW	NTS	**6013/100**	P1


W5
rwp5
rwp4
W4
(N)
rwp4
W6
rwp
Seat of dry rot
W7
W
rwp3
W2
rwp2
D1
rwp1
W1
SPIRE

APPENDIX 2

YORK SILLS INSPECTION REPORT LETTER

Ref 6013

26th APRIL 2018

The observations within this letter are for guidance only. The Tenderer must satisfy himself as to the current condition of the property and the extent of repairs required. Any specific items should be identified and priced separately and included in the Tender Total.

Unit 5
Checkpoint Court
Sadler Road
Lincoln
LN6 3PW

Tel: 01522 690815
info@yorksills.co.uk

Horncastle Town Council
Community Access Point & Library
Wharf Road
Horncastle
Lincs
LN9 5HL

For the Attention of: Amanda Bushell

26th April 2018

Ref: RW/BM/6013

By email only to info@horncastletowncouncil.co.uk

Dear Mrs Bushell,

CHAPEL SPIRE, BOSTON ROAD CEMETERY, HORNCASTLE

I visited site on Thursday 26th April in order to undertake the inspection of the Spire from a cherry picker. The purpose of the inspection was to investigate the cause of the cracking observed in the stonework at high level just below the eaves line of the Spire.

The Chapel is a late Victorian freestanding single storey structure and is Grade II listed. On the northwest corner of the Chapel stands an octagonal tower *(Photo 1)* of coursed masonry construction surmounted with a large capstone, anchored by a large central tie bar *(Photo 2)*. This capstone forms the plinth upon which are seated eight dressed stone columns supporting the eaves level band of stonework *(Photo 3)* which, in turn, supports a timber wallplate and the timber spire structure above.

The spire roof structure comprises timber rafters birds-mouthed over the wallplate, completely boarded with 1" thick softwood boarding and then tiled with slate tiles and lead rolls at the corners. The octagonal wallplate is tied across with a timber cross-tree comprising pairs of softwood timbers which intersect at the centre of the spire *(Photo 3)*. At this position, a vertical tie rod is anchored to the underside of the wallplate ties and extends all the way up to the pinnacle where it supports a wrought iron finial.

At each of the four positions where the wallplate tie beams meet the wallplates, tie bars extend from the wallplate tie beams down to the plinth/capstone. It is not known whether these tie bars are wrought iron or steel, however they are corroded but this does not appear to have affected their structural cross section significantly.

The tower was struck by lightning around 25 years ago and, according to some photographs which Stuart provided on site from your own records, it is clear that the tower was in poor condition prior to this event, with holes in the roof covering and corrosion of the mid-height mild steel ties across the arched openings caused each of the column stonework to split.

We understand that the remedial works undertaken in 1993 included the removal of the timber spire and the stonework was taken down to the column level, where the mid-height stones of the

columns appear to have been completely replaced with new phosphor bronze ties between. The stonework above these appears to be original, having presumably been salvaged and re-laid in lime mortar.

Observations

A horizontal crack occurs in the bed joint immediately above the arched openings below the corbelled stonework. This horizontal crack extends almost completely around the circumference of the tower and exhibits vertical displacement of approximately 2-3mm fairly uniformly around the tower.

Immediately below the same bed joint, the perpend joint between adjacent column sections (at the head of the arched openings) exhibits spalling of the outer face of the stonework or cracking indicating the early signs of spalling to all sides of the tower.

To the north elevation *(Photo 5)*, some of the spalled stonework fragments were loose and were removed for safety reasons. To the southwest corner, some of the small infill stones between the rafter above the corbel course were loose and one of these stones was removed as a safety precaution *(Photo 6)*.

Internal viewing of the tower is difficult, as between the columns is only 180mm. Nevertheless, it could be clearly seen that the same bed joint which exhibited vertical displacement externally had the same movement internally *(Photo 7)*. There also appeared to be more degradation of the bed joint mortar internally than externally.

To the northeast corner, there was also some significant stonework erosion around the mortar bed joints and perpend joints *(Photo 8)*. This does not appear to be recent or ongoing, and is quite likely due to the cement pointing internally which was reportedly present prior to the lightning strike in 1993. The current mortar all appears to be lime-based.

The roof structure appears to be generally in good condition where visible. There were some slightly misaligned wallplate joints and rafter birds-mouths which were not flushly aligned with the stonework, however this is quite likely to be misalignment at the time of reconstruction rather than a sign of any movement of the roof. The roof is well tied down and in good alignment generally with no signs of recent movement.

Technical Appraisal

Whilst a lack of access internally prevented us from definitively ascertaining the cause of the cracking, it is very likely that the cause of the cracking is expansion of corroding embedded metalwork. It is likely that wrought iron or steel cramps are present between the adjacent stones of the top of the arched openings. The expansion of the corroding metalwork is causing the upper stonework to lift away from the lower stonework, creating the gap observed in the bed joint.

It is likely that the same piece of corroding metalwork is also causing the outer face of the stonework to spall. Left unaltered, the metalwork will continue to corrode and expand, causing further damage to the stonework and eventually threatening the stability of the spire.

Recommendations

It is recommended that the corroding metalwork is removed and replace with new stainless steel or phosphor bronze as appropriate and provide indented stone repairs to the worst affected areas of spalling. Less severe spalling may be glued in place using a suitable compound.

The biggest challenge to replacing the corroded metalwork will be gaining working access. The gaps between the perimeter columns are too small for any practical working access and whilst one or two columns could be removed and replaced with props to ease access, it will be very difficult to gain access to remove sections of stonework and provide indented repairs.

The most straightforward method might be to remove the timber spire in its entirety, take down the two courses of masonry to expose the affected bed joint, and replace all embedded metalwork with stainless steel or phosphor bronze and re-fix the spire roof. The four tie bars which hold the roof down are corroded but have not lost a structurally significant proportion of their cross-sectional area so could simply be brushed back to bright metal and painted with a suitable high build paint system.

The cost of removing the spire and scaffolding the remaining tower to enable the repair works to be undertaken would obviously be significant. It may be worthwhile holding early discussions with a suitable contractor to discuss the feasibility of the work and whether any alternatives could be developed. A budget figure could then be obtained for the full repair work but we understand that it is likely that external funding may need to be sought in order to complete the work.

Anticipating that this process may take some time, we would recommend that an interim repair be undertaken in order to maintain the stability of the spire over the next 2-5 years. This work should comprise the raking out and slate packing of the affected bed joint before repointing with lime mortar externally and internally, as far as can be practically achieved.

As the tower would presumably be scaffolded at the time, the opportunity could be taken to remove some of the low level spire roof tiles in an inconspicuous area to try and investigate the positions of the corroded ties from above, perhaps by removing a small section of the wall plate. If the problem is then found to be limited to a series of easily located cramps on each corner, it may be possible to explore undertaking the tie replacement work from outside by cutting out a section of the stonework, replacing the tie and indenting a repair piece. The feasibility of this will only become clear when we have an idea of the size, frequency and nature of the corroding metalwork.

An alternative method of preventing further corrosion would be the use of cathodic protection, whereby a small electric current is passed through the ties effectively inhibiting the production of further rust products. This solution, however, still involves accessing the corroding metalwork in some way and will represent an ongoing maintenance issue, so the preference would also be to replace the ties if access is at all possible.

I have attached a sketch indicating the general layout of the tower together with some photographs. We trust this will enable you to put matters in hand, obviously subject to receiving the relevant consents and permissions, but please do not hesitate to contact me directly if you

wish to discuss any of the above or require any clarification. Finally, please find enclosed our fee account for our input to date which we trust you will pass on for payment on our behalf.

Yours sincerely

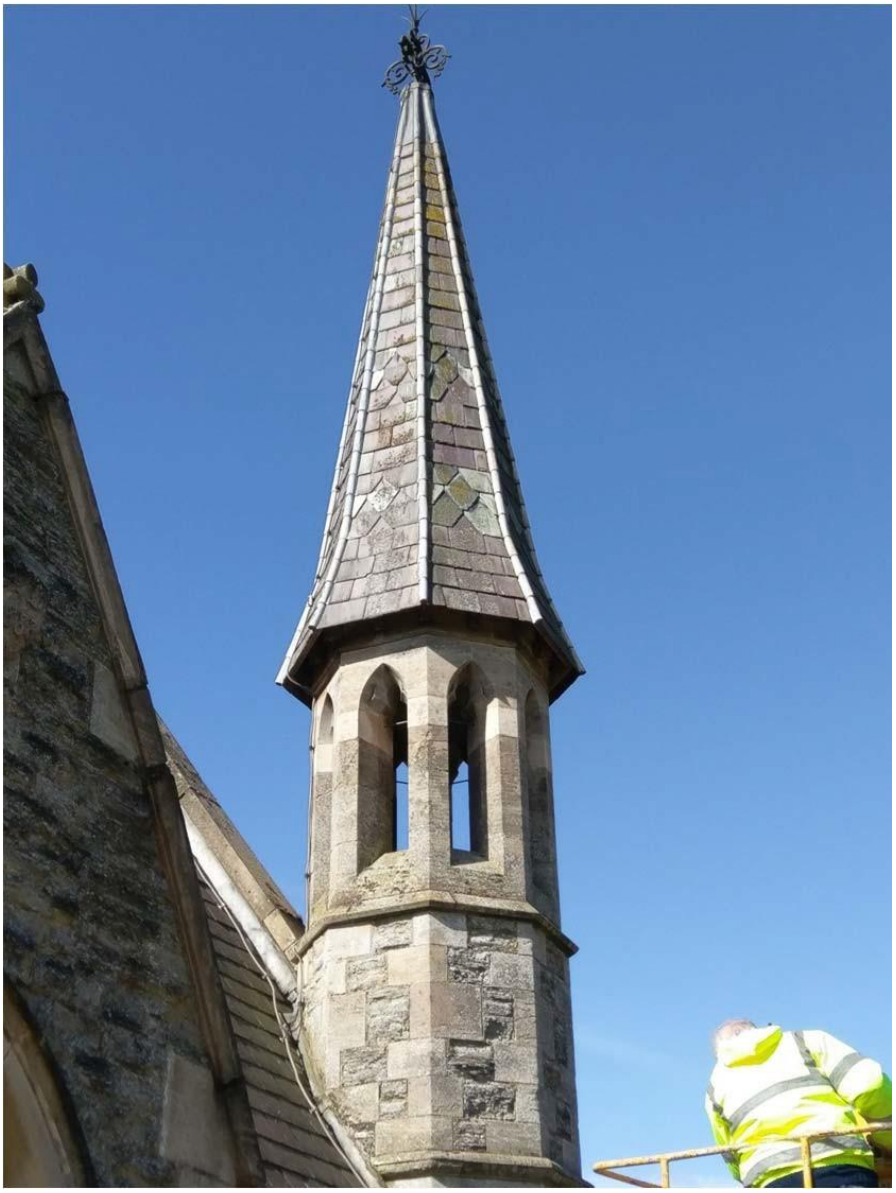
Robert Webster

Enc

PHOTOGRAPHS

CHAPEL SPIRE
BOSTON ROAD CEMETERY
HORNCASTLE

York Sills Ltd., Unit 5, Checkpoint Court, Lincoln LN6 3PW
Tel: 01522 690815 E-mail: info@yorksills.co.uk

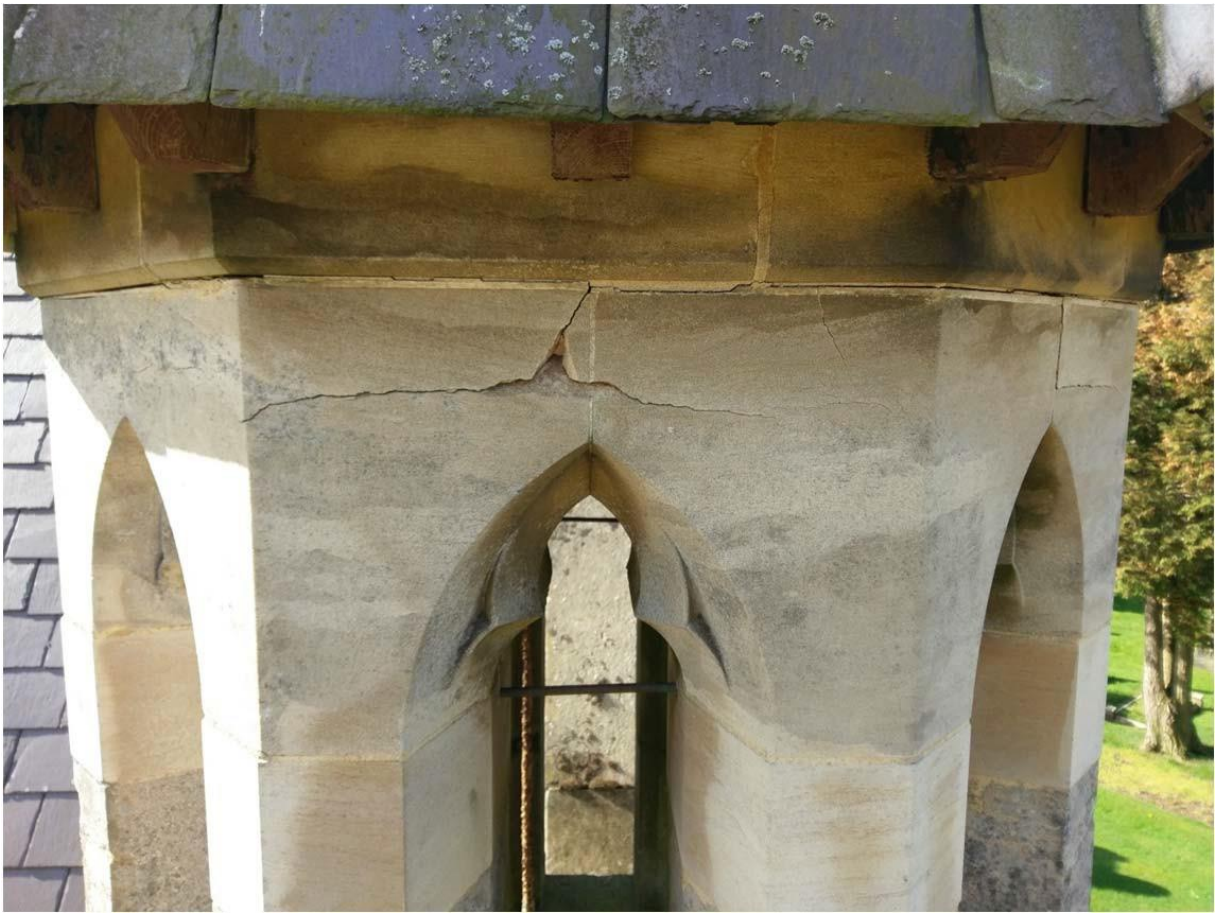


P1 – General view from Northeast

P2 – Plinth / cap stone with central tie bar

P3 – Dressed stone columns

P4 – Internal view of roof structure (north at bottom of picture)



P5 – Horizontal cracked bed joint and spalling face (north elevation)

P6 – Loose corbel stone removed from southwest elevation

P7 – Horizontal bed joint cracking

P8 – Eroded stonework internally