Statement of Significance

Section 1: Brief history and description of the bells.

In 1896 the bells were increased from a ring of six to a ring of eight bells. At the same time two of the six bells, the old fourth and old fifth were recast. The two 'new' bells were cast by Mears and Stainbank, Founders, London.

The Treble was one of the new bells cast in 1896. It weighs 5cwt 3qr and has an Eb note. The inscription indicates that the Rector was George Maberley Smith and the Churchwardens were Frank Arnold and George King.

The Number 2 bell is dedicated to the memory of Frank Ernest Hills of Redleaf who died in 1896. It weighs 6cwt and has a D note.

The third bell has a C note and weighs 7cwt. The bell was donated by Gilbert Spencer in 1701 and was cast by R.Phelps, Master Founder at Whitechapel at that time.

The fourth bell was cast by Thomas Meade at Whitechapel in 1802. It weighs 6cwt 3qr with a Db note.

Number 5 is the oldest bell in the church. It is ascribed to John Kebyll and is thought to have been cast ca.1480. There appears to be no direct evidence to the identity of the founder but the bell bears the arms of the Keble(sic) family and a John Kebyll, a wheelwright, rehung some bells for St. Stephen's Walbrook, London in 1480. The inscription band has two decorative crosses and the arms of the Kebyll family. The bell weighs 7cwt 2qr 26lb and has an Ab note.

The sixth bell is from the same foundry as the Kebyll bell but was recast in 1896 by Mears & Stainbank. A Latin inscription just above the lip translates as "May John's bell ring out for many years". The bell weighs 10cwt 3qr 7lb and has a G note

The seventh bell was originally cast by Thomas Mears in 1802 and was recast by Whitechapel in 1896. It weighs 14cwt 0qr 6lb.

The Tenor bell is the heaviest bell in the church weighing 17cwt 2qr 16lb with an Eb note. It was cast by Joesph Hatch in 1619. The Hatch family ran a foundry at Ulcombe, near Maidstone for eighty years.

Statement of Needs

Section 1. General information

The church bells are rung Sunday service, as are most bells, also rung for weddings. But are in need to refurbishment as clapper wear is now significant.

Section 2. What do you need?

To turn the bells as clapper wear now past recommendation and in need of remedial action,

Section 3. The proposals

Eighth turn the bells, rehang with mainly new fittings and adjust the rope falls down through the tower.

Make a new headstock for each of the bells.

Tune the bells.

Remodel the three smaller bells.

Section 4. Why do you need it and why do you need it now?

Doves guide (CoE bells protocol) states that clapper wear must not be greater than 10%, Wear at the present strike points of the eight bells is as follows, all expressed as a percentage of total thickness; tenor 5%, seventh 11%, sixth 12%, fifth 11%, fourth 12%, third 4%, second 10%, treble 8%. 10% wear is generally accepted as the wise maximum at which point remedial action should be taken and it follows that five of the bells are at or past that point with the treble fast approaching it.

Section 5. Justification

In order to continue ringing the bells there is a need to refurbish the bells.

MATTHEW HIGBY & COMPANY LTD

BELL FOUNDERS - BELL HANGERS – SERVICE ENGINEERS

Unit 16, Charmborough Farm, Holcombe, Radstock, Somerset, BA3 5FX
Tel: 01761 233757 **or** 07971 441042 **Email:** matthewhigby@gmail.com
Website: www.bellhangers.com

Company no 4540126 VAT Registration number 779 4220 01

The Church of St John the Baptst, Penshurst, Kent. 27th July 2023.
A report on the bell installation with proposals and recommendations for restoration.

The Tower



The tower from the south side.

This impressive western tower appears to date from the early 15th Century and is of stone with rubble fill construction. The ground floor chamber is approx. 30 feet in height and is well lit with natural light from a large west window and is open to the church on the east side, via a large stone archway. There is a steel rope guide frame mounted approx. 18 feet above the floor. A stone spiral stairway in the south-west corner of the tower (accessed internally) gives access to the first-floor chamber. The first-floor intermediate chamber measures approximately 16 feet in height and houses a mechanical clock with separate chiming system. There are small windows to the north and south. Three large oak foundation beams span the tower in an east to west direction and are built into pockets in the tower walls. There are various bell-cranks and control wires for the clock hammers which strike the quarters and hours. A drive bar controls an external clock face on the south

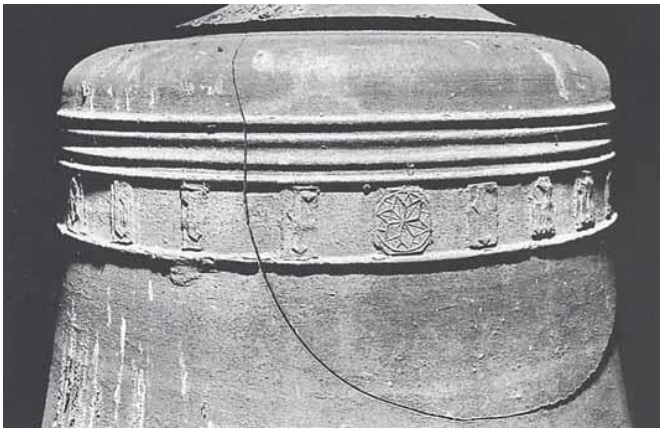
side of the tower. The second-floor belfry contains a ringing peal of 8 bells hung in a bell frame of cast-iron mounted on a timber foundation.
There is good lighting and power throughout the tower.
There are some beams which form the tower roof structure which might be useful for lifting purposes.
There appears to be an operational trap door in the first floor, large enough for the bells and associated gear/fittings to pass through to ground level. The second floor appears to have boards which can be removed to create a trap way.

The Bells

The outline details of the bells are as follows:

Bell	Weight *(Cwt-qtr-lb)*	Note	Dia *(Inches)*	Date Cast	Founder	Canon Type
1	5–3–19	E♭	30.00″	1896	Mears & Stainbank, Whitechapel	Traditional
2	6–0–3	D	31.00″	1896	Mears & Stainbank, Whitechapel	Traditional
3	7 cwt	C	33.50″	1701	Richard Phelps, Whitechapel	Removed
4	6¾ cwt	B♭	35.00″	1802	Thomas I Mears, Whitechapel	Traditional
5	7–2–26	A♭	36.00″	*c*1370	S Norton or J Kebyll, London	Removed
6	10–3–7	G	40.13″	1896	Mears & Stainbank, Whitechapel	Doncaster Head
7	14–0–6	F	44.00″	1896	Mears & Stainbank, Whitechapel	Doncaster Head
8	17–2–11	E♭	47.50″	1619	Joseph Hatch, Ulcombe	Removed

All eight bells were cast with canons or supporting loops, from which they were originally suspended. These remain intact on all except bells 3,5 and 8 which have had them removed. These bells are now supported by bolts passing through holes in their crowns. It appears that all the bells were also cast with casi-in crown staples, although it seems that these have either been removed or partially removed to allow independent crown staples and modern clappers to be fitted through central holes. As the name describes, a “cast-in” crown staple is a loop made of wrought iron, from which the clapper is hung. This would have been cast into place as part of the bell manufacture and being made of a ferrous material, the staple corrodes, delaminates could potentially expand to up to 7 times its original size, building up huge pressure on the surrounding bell metal. Corroded cast in crown staples are the most common cause of cracks in bells, and any remains of these should be carefully extracted as part of any planned restoration.



A typical crack caused by corroded cast-in crown staple.
(Sparkford, Somerset – Photo Christopher J N Dalton).

Bells 3,4,5 and 8 have been turned in the past to present an unworn face of the sound bow to the strike. From what can be seen as they hang in the tower, the bells appear to be in sound condition. Bell 5 is listed as being of historic importance by The Church of England.

Tone and Tuning

An analysis of the 5 main partial tones of the bells has produced the following frequencies (which measured in Hertz.

Bell	Detail	Hum	Prime	Tierce	Quint	Nominal
1	**Should be**	312	624	742	935	1248
	Is	**352**	**581**	**771**	**?**	**1274**
	Error	**40**	**-43**	**29**	**?**	**26**
2	**Should be**	294	589	700	882	1178
	Is	**312**	**544**	**705**	**?**	**1180**
	Error	**18**	**-45**	**5**	**?**	**3**
3	**Should be**	262	523	622	784	1047
	Is	**298**	**520**	**665**	**835**	**1078**
	Error	**36**	**-3**	**43**	**51**	**31**
4	**Should be**	236	471	560	706	942
	Is	**272**	**463**	**590**	**765**	**967**
	Error	**37**	**-8**	**30**	**59**	**25**
5	**Should be**	209	419	498	627	837
	Is	**218**	**432**	**513**	**647**	**843**
	Error	**9**	**13**	**15**	**20**	**6**
6	**Should be**	196	393	467	588	785
	Is	**220**	**395**	**483**	**?**	**793**
	Error	**24**	**3**	**16**	**?**	**8**
7	**Should be**	177	353	420	529	707
	Is	**195**	**350**	**431**	**?**	**712**
	Error	**18**	**-3**	**11**	**?**	**6**
8	**Should be**	157	314	373	470	628
	Is	**171**	**334**	**389**	**?**	**628**
	Error	**14**	**20**	**16**	**?**	**Datum**

The errors (shown in red) are compared to harmonically tuned bells, which has been the modern standard since the late 1920's.

The sound of a bell is made up numerous different overtones, but the 5 main partial tones have the following names:

Nominal - The overtone tone to which the other bells most of often musically relate.
Prime - (sometimes referred to as the "Fundamental tone") - Ideally an octave below the nominal.

Hum - Ideally an octave below the prime (i.e. 2 octaves below the nominal).
Tierce – A minor third (3 semitones) above the prime.
Quint – An approximate fifth (7 semitones) above the prime.

The design of the profile, shape and thickness of a bell, directly effects the arrangement of these 5 main partial tones. If they are drastically mis-aligned, the bell will sound unpleasant. If they are correctly aligned, the bell will sound sweet and harmonious (also referred to as being harmonically or "Simpson" tuned). This method of tuning was discovered by the Hemony Brothers of Amsterdam in the mid-17th Century, and was adopted as standard practice in the UK, during the early 20th Century, following much research by Canon A B Simpson.

The tone and tuning of these bells is distinctly 'old style' in nature. The hum partial tones are in all cases sharp of ideal (to varying degrees) and the majority of the prime partial tones are flat of ideal.

As bell no 5 is listed for preservation, I believe that there is little chance of gaining permission to tune this bell, however as things currently stand, this is the best sounding bell in the tower! There is ample scope for improving the individual tone of the remaining 7 bells, and the musicality of the peal as a whole. This could be done, whilst leaving the existing no 5 bell untuned.

Bell Fittings

Headstocks

The headstocks are made of hardwood and were fitted during a major restoration of the bells by Thomas Blackbourne of Salisbury in 1896. They are fitted with plate gudgeons. The bells are supported by iron straps and dogs, which pass through the canons or through holes in the crowns of the respective bells. These are secured with nuts on top of each headstock. The headstocks of are becoming decayed and several small cracks (known as 'shakes') were noted. The ironwork is beginning to sink into the timberwork as it deteriorates and the gudgeon plates are no longer accurately aligned as a result.

Main Bearings

The bearings were renewed in 1973 by The Whitechapel Bell Foundry and consist of self-aligning ball races housed in cast-iron 'pillow-block type' housings. We noted that some of the bearings appeared to have received some attention more recently.

Wheels

These are made to traditional designs, using hardwood with outer shrouds secured with iron nails or screws. These are heavily corroded and cracking the surrounding timber.
The wheels are braced by round iron wheel stays, from the timber headstocks.

Clapper Assemblies

The clappers are made of traditional wrought iron, with ring type top ends. It appears that the clappers have received some attention in recent years, and appear to be in fair working order.
The clappers hang from steel or cast-iron independent crown staples, secured by central bolts which pass through the crown of the bell and also the headstock. The pivot pins are of stainless steel (which is far from ideal) and lack any method of lubricating the pivot bush, without a complete dismantling of each assembly.

Roller Boxes

The rollers are formed of timber or moulded nylon sheaves, housed in hardwood boxes. Apart from grooves in their outer sheaves, they appear to be in good order.
The roller box of bell 8 appears to be poorly anchored. At the time of my visit, the plank to which it was attached, was somewhat loose.

Stays, Sliders & Runner Gear
The ash stays are of straight type and these engage with curved ash sliders. Generally these are serviceable but showing signs of age and wear.

Bell Ropes and Rope Ways etc
The ropes are in fair condition and have pre-stretched polyester top ends. They generally fall plumb from the roller boxes to the position of the ringer, and do not have flap boards or rope chutes. The rope bosses are made of turned hardwood. The rope guide is made of iron and has timber sally jugs.

Clock Hammers
There are drop-type clock hammers on bells 2,3,4,7 and 8. These are driven by and array of levers, cranks and wires, from the clock chamber below.

Chiming Hammers
There are no chiming hammers.

Bellframe

Like the majority of the bell fittings, the bell frame dates from 1896 and is the work of Thomas Blackbourne of Salisbury. The frame consists of cast iron lowside type framesides and end gates, bolted to timber beams which span the tower in both directions. These beams rest in pockets in the tower walls or on an offset in the tower walls.
Bells 3,4,7 and 8 swing east-west, and the remainder north-south in a standard 8-bell layout.
In general, the frame is in good condition, and there is very little sign of movement within the frame whilst the bells are being rung.
There is a gap between the frame and the tower walls, has been allowed to fill with dust/bird sticks etc. This must be cleaned out, as it tends to harbour moisture which leads to advanced decay.
The timberwork is dry and the ironwork is showing signs of surface corrosion. I suggest that general timber treatment and the cleaning and painting of all ironwork forms part of any proposed project.

Conclusions and Recommendations

It is now 50 years since any significant work was undertaken to the bellframe and fittings, and the majority of the fittings currently in use date from 1896. It is clear that these are nearing the end of their useful lives.

I therefore recommend that the following works are considered:

- I recommend that the bells are conserved and have any remains of the original cast-in crown staples removed, and each bell is checked for cracks.
- I strongly recommend that the bells are tuned together to enhance their tone and musicality.
- The bells should be rehung with mostly new fittings. The only fittings which I suggest are reused, is the wheel spokes which could be re-rimmed and adjusted to optimum size.
- The gap between the bellframe and the tower walls should be cleaned out to allow air to circulate around the timberwork.
- The timber areas of the bellframe should be cleaned and treated with wood preserver. All ironwork should be cleaned down and treated with rust inhibitor, then primed and then painted with exterior grade machinery enamel.
- The bells should be rehung in the frame and fully adjusted to give optimum performance from minimal effort.

With these thoughts in mind, I have produced the attached estimates.

Report written and complied by Matthew Higby
Date 27th July 2023.

Information included in this report has been taken from:
Our own site inspection.
Dove's Guide (CCCBR).

Photographs



The ground-floor ringing chamber.



The clock chamber showing the bellframe foundation beams.



A general view of the belfry.



One of the headstocks, showing a crack or ‘shake’.



The tower roof.

MATTHEW HIGBY & COMPANY LTD

BELL FOUNDERS - BELL HANGERS – SERVICE ENGINEERS

Unit 16, Charmborough Farm, Holcombe, Radstock, Somerset, BA3 5FX
Tel: 01761 233757 **or** 07971 441042 **Email:** matthewhigby@gmail.com
Website: www.bellhangers.com

Company no 4540126 VAT Registration number 779 4220 01

Church of St John the Baptist, Penshurst, Kent. Estimate date 27th July 2023.
To retune and rehang the existing bells with mostly new fittings, in the existing bellframe.

Pre-commencement Meeting
To send a company representative to the church to meet with the church architect and parish representatives, to discuss the project in fine detail, and to establish timescales and a sequence of working (particularly if other contractors/volunteers are involved).

Dismantling
Travel to the church with all required tools, equipment and certificated lifting gear.
Install temporary lifting beams above the bells, secured to the walls by stainless steel resin anchor bolts, to enable the bells to be safely lifted from their frames and lowered.
Open up the trap doors down through the floors of the tower.
Carefully dismantle the bells and their fittings, lowering everything to the floor. Provide plywood sheets to protect the floor of the church during removal. Carefully move the bells from the base of tower, through the church to the outside where they can be collected by lorry and transported back to our workshop.
Dispose of all unwanted fittings.

The Bells
Clean and check each bell for cracks. Liaise with the PCC if any unforeseen repair works are required.
Carefully remove the canons from the bells which still have them
Cast hard resin pads on the crowns of the bells and machine them flat.
Carefully adjust the main and partial tone of each bell to enhance their individual tone together with their musicality as a peal, leaving bell 5 untuned. Take accurate internal and external measurements of each bell to enable the working drawings to be produced.

Bell Fittings
Provide each bell with the following fittings:

- Headstock of spheroidal graphite cast iron, with turned steel gudgeons secured in morse taper sockets, adjustable wheel cleats and clapper adjustment screws for the setting and subsequent maintenance of even striking. The hanging radii of each bell to be carefully tested and adjusted within our works, to give graded turning speeds from treble through to tenor.
- Self-aligning, double row ball bearings, in cast iron plummer block housings.
- Heavy steel bedplates to mount the bearings to the frame heads.
- Support bolts, with nuts, lock nuts and isolation washers.
- Independent clapper staple fitted with a high tensile steel hinge pin.
- Clapper of spheroidal graphite cast iron, properly proportioned and fully machined along its length. The eye to be fitted with a PTFE Impregnated Tufnol bush at the point of swing and grease applicator.
- Pulley of cast nylon, running on twin sealed for life ball races, housed in a hardwood box.
- Stay and slider of Ash with hardwood runner board and adjustable stop blocks.
- Slider pivot bracket of steel.
- New bell rope of flax with a braided (low stretch) Dyneema top end.

Re-rim the existing wheels, providing new soling and shrouds. All fixings to be of stainless steel.

Stock down the bells and provide all new support bolts, nuts, washers and isolation washers. Carry out a full assembly of each bell and its fittings before being dispatched from our works.

The Bell Frame
Clean and descale the lower bell frame. Treat all accessible areas with rust inhibitor and two coats of exterior grade machinery enamel.

Painting and Metal Treatment
All iron and steelwork to be thoroughly cleaned and descaled.
Steelwork to be hot dip galvanised (**BS** EN ISO 1461:2009) or hot zinc sprayed (**BS** EN 22063) as appropriate.
Woodscrews to be of stainless steel.
Iron castings and some smaller steel fabrications to be painted with our regular rust inhibiting paint system.
Timber to be treated with high quality wood preserver.

Installation
Deliver the refurbished bells and fittings to the church.
Hoist and bells and their fittings into the belfry and assemble them in the bell frames.
Adjust each bell for even clappering using our laser activated timing meter and for the correct depth of set at both handstroke and backstroke.
Alter any rope paths that maybe required.
Fit the bell ropes and adjust for both height and length.
Remove the temporary lifting beams, lower to the floor and close all trap doors.

Commissioning
Arrange for a test ringing of the bells with the local bellringers and following any final adjustments, leave the restored ring all ready for use.

Quotation
We undertake to carry out the whole of the work specified above, including the provision of equipment, labour, draughtsmanship, expenses, carriage and third-party insurance in connection therewith, for the sum of:
£ 70,513.00 + VAT.

Specifically excluded from this estimate
These items are specifically excluded from the above estimate. Advice is always offered freely with regard to any of the following points. Please ask if you need help or clarification.

- The provision of new electrical lighting and sockets.
- Bespoke method statements, risk assessments and other paperwork which may be required.
- Making good of any decorative areas, including existing ceilings etc, after the new rope paths have been constructed.
- Any repairs to cracked/defective bells.
- Any clockmakers work involved with altering existing clock hammers and associated cranks/drive wires to suit the revised arrangement.

Possible Deductions/Allowances

Cleaning down and painting the lower bell frame
If members of the parish/local ringers are able to undertake the cleaning down and painting of the lower bell frame, we can make an allowance of **£3594**. To supply the paint to match what we use on the fittings, would cost **£297 + VAT**.

Accommodation and Subsistence
If members of the parish/local ringers are able to supply bed, breakfast and evening meal for our bell hanger(s) whilst working on site, we can make an allowance of **£1,860.00.**

Transport

If a local transportation firm can provide craning and haulage facilities, free of charge, to transport the bells, bellframe and fittings to and from our works, we would be willing to make an allowance of **£1,480.00.** Any lorry must have an onboard hi-ab crane to enable the bells to be loaded/unloaded at site and must carry adequate goods-in-transit insurance cover.

Matthew Higby & Co Ltd – Estimate Notes and Terms of Business.

General Business Etiquette
We strive to give honest and factual advice from the outset, and aim to be as flexible and transparent at every stage of our business transactions. At no point will we ever attempt to sell you something that you don't need, and try to make ourselves readily available to discuss answer any questions which you may have.

Acceptance of Quotations
Due to the current volatile nature of the metal markets, these quotations are based upon current costs, but can be held firm if accepted in writing within three months of the estimate date. Revised estimates can be supplied on request.

Standard Terms of Payment
We try to be as flexible as possible when it comes to payments and payment regimes. We offer a range of options which would be agreed by both parties in advance. A 100% refundable deposit with order would hold prices for up to 1 year whilst fundraising continues or faculties are sought. We offer a discount for full payment in advance. Our most regular payment regimes work out as follows:

For orders where the total value is less than £20,000 (ex VAT):
50% when work begins.
The balance, less any deductions due, on completion.

For orders where the value exceeds £20,000 (ex VAT).
These quotations are based upon the following terms of payment:
One-third payable when work starts.
One-third at an agreed midway point.
The balance, less any deductions, within 14 days of our final invoice.

Lead times
For larger projects we currently have approximately a 6-9 lead time from the point of order, to being in a position to start work. This does alter on a regular basis, so please do check the current status. Our site working slots are then allocated on a first come, first served basis, after both faculty permission and funding are in place. Smaller projects can often be slotted in alongside other larger projects.

Grant Aid
If the project is lucky enough to secure grant aid, please note that the customer is 100% liable for the full amount to be paid within the terms of our invoice (our invoice terms are generally payment within 14 days unless agreed in advance). We have past experience of grant making bodies and trusts taking over 12 months to pay. If Trusts and Grant Making Bodies prefer to pay the contractor direct, the customer is still liable for the full amount to be paid within the terms as detailed on the invoice and we will fully reimburse the customer when the funds have been received.

Faculty Permission etc
Most of the work to be undertaken to bell installations in churches requires a faculty to be granted by either the Archdeacon (for smaller works) or by the Chancellor of the Diocese. We are not in a position to commence any work until we either receive a copy of such documentation or written notification that it has been received.

Insurance
We carry full insurance cover for all of our products and our site work. Please ask if you require details.

Volunteer 'DIY' labourers
We are aware that some of our competitors offer sizeable savings for local volunteers assisting with site work. Having consulted 4 separate insurance firms with regard to this matter, we have been assured that insurance cover for those assisting with sitework is a very grey area. As things currently stand, our insurers refuse to provide insurance cover for what they consider to be 'untrained operatives' assisting with physically demanding works, which often involve working at height, and lifting heavy objects. If you can provide insurance cover for volunteer labourers, through the church's own insurance firm (at no cost to our firm) then we would be happy to look at this proposal again.

Drawings and Photographs
All drawings, plans and photographs are the property of Matthew Higby & Company Limited and are subject to copyright.

Value Added Tax
If the building in which the bells are to be installed, is a listed place of worship. the VAT paid should be reclaimable via the Listed Places of Worship Grant Scheme. See http://www.lpwscheme.org.uk/ for more information.

Guarantees
All bell frames and most new bell fittings are also guaranteed for the ten years. Stays and sliders, which are designed to break when subjected to excessive force, are not guaranteed. Frictional parts such as clapper bushes are only guaranteed through faulty materials or workmanship, and do not include normal wear and tear. Bell ropes are guaranteed for 12 months from the point of sale, not the point of fitting.

Delivery Dates
We endeavour to give realistic and firm delivery dates for all of our projects. However, with the best will in the world, these sometimes have to be amended depending on obtaining parts from suppliers. We endeavour to give constant updates if problems occur. Do not arrange dedication ceremonies etc, until we have a confirmed date of installation.

Method Statements, Risk Assessments, Health and Safety
We have a full company health and safety policy, copies of which can be made available on request. This policy carries general method statements and risk assessments which cover the majority of or work. Bespoke method statements and risk assessments are included in this estimate, together with compliance of all applicable regulations and legislation which are required for a project of this type.

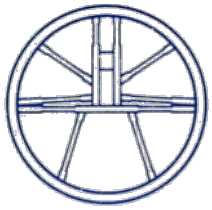
Visiting our Works
We invite our customers to visit our works whilst we are working on their projects. We often entertain large parties and are pleased to provide descriptive talks and guided tours of our workshops, Tours often includes demonstrations of various aspects of our work and bellringers are welcome to use our small demonstrator peal or in-house dumbbell to demonstrate their own skills. Some customers choose to use their visit as a fund-raising event or to publicise their project. Refreshments can be provided by the customer, or by ourselves by prior arrangement.



Tel: 01865-862549

VAT Reg. No. 311 5128 09

Directors
B. R. WHITE
G. J. CLIFTON
J. A HASELDINE
A. HASELDINE



Whites of Appleton Ltd
(Established 1824)
Church Bellhangers
69 EATON ROAD
APPLETON, ABINGDON, OXON
OX13 5JJ
e-mail: bells@whitesbellhangers.co.uk

Estimate

11th May 2023

CHURCH OF SAINT JOHN THE BAPTIST

PENSHURST, KENT

REHANG THE EIGHT BELLS IN THE EXISTING BELL FRAME

DISMANTLING

Attend the Tower with our Bellhangers and all necessary tools and lifting equipment.

Dismantle the eight bells and their fittings, lower them to the ground and remove all old fittings from the Tower.

Transport the bells to our Works.

BELLS

Enlarge the centre holes for clapper adjustment in all eight bells.

Remove as much of the cast-in crown staple roots as practicably possible from all but the 7th and 6th bells to reduce the chances of these bells becoming cracked in the crown.

Carefully remove the canons from the crowns of the 7th, 6th, 4th, 2nd and treble bells and cast resin pads on the crowns of all bells to receive modern headstocks.

Drill the bells to receive their new support bolts, reusing any existing holes where possible.

Adjust the chief harmonic tones in each bell under the tuning machine to bring the ring as a whole into tune and their partial tones into better alignment.

Voice the bells to establish their optimum clapper striking positions.

When rehung, turn the bells to present unworn surfaces to the blows of their respective clappers.

BELL FRAME

Check over and tighten all ironwork in the bell frame.

Level, bed and securely bolt heavy steel bearing foundation plates to the top cills of the frame in the 7th and tenor pits to receive the new self-aligning ball bearing units.

RINGING FITTINGS

Fit as follows:

- Cast iron box-section headstocks with fixed steel gudgeons turned in true alignment, new heavy-duty double-row self-aligning ball bearings (in new totally enclosed dust-proof housings for the tenor and 7th and the refurbished existing housings for bells treble to 6th) and clapper adjustment screws to maintain even striking of clappers.
- Hot-dipped galvanised 8.8-grade steel supporting bolts, nuts, locknuts and insulation washers.
- Independent crown staple units, each fitted with a "maintenance free" stainless steel clapper pin.
- Machined and profiled ductile iron clappers, each with a machined Tufnol bush resiliently mounted in Neoprene rubber at its point of swing and a greasing point/
- Traditional hardwood wheels each fitted with two steel angle braces.
- Refurbished *existing* hardwood pulley units with *new* hard-wearing nylon sheaves.
- Slider pins with facilities to prevent the sliders from lifting and to take up wear at the pivot.
- Dry ash stays and sliders and hardwood runner boards.
- Ceiling and floor rope bosses.
- Rope chutes and guide pulley units in the clock room as required.
- A set of bellropes with pre-stretched terylene top ends and close-woven pure wool sallies (see "Possible Deductions" for re-using the existing bell ropes).

Treat all timber fittings with insecticide/preservative and all non-galvanised metal ringing fittings with three coats of high quality exterior grade paint.

REHANGING

Transport the bells and their fittings from our Works to the Church.

Attend the Tower with our Bellhangers and all necessary tools and lifting equipment.

Hoist the bells into the tower and hang them, complete with their fittings in the bell frame, firmly bolting the self-aligning ball bearing units to the steel bearing foundation plates.

Fit guide pulley units and rope chutes as required in the clock room, fit new ceiling and floor rope bosses, set up the clappers for even clappering, adjust the handstroke and backstroke sets, test-ring the bells both singly and "in peal" and leave them in good order for full-circle ringing.

For the sum of:

SIXTY THOUSAND, THREE HUNDRED & THIRTY-NINE POUNDS
(£60,339.00)
PLUS VAT

POSSIBLE EXTRA

When/if the new ringing gallery is constructed, remove the existing rope guides. *This may be cheaper if carried out by the contractor installing the new ringing gallery.*

£1,456.00 + VAT

NOTES

These estimate figures are based on current prices and are therefore subject to fluctuation.

EXCLUSIONS

This estimate specifically excludes the following:

1) The construction and preparation for easy lifting of trap ways in all floors for the removal and return of the bells and fittings.

2) The de-rusting & painting of the existing bell frame ironwork. This would be considerably cheaper if carried out by a local tradesman or as a "self-help" exercise by the local ringers/congregation.

3) Any required works to the clock, including the clock hammers.

4) Any required repairs to the bell chamber floorboards.

TERMS OF PAYMENT

1) 33% when the bells have been dismantled and transported to our Works.

2) 33% on completion in our Works.

3) The balance, less any deductions due, when works are complete in the Tower.

POSSIBLE DEDUCTIONS

1) **Fit & able-bodied** local labour to assist us with dismantling & lowering of the bells and old fittings (minimum 3 persons). **£1,360.00**

2) Transporting of the bells and fittings from the Church to our Works (including loading at the Church). **£1,131.00**

3) Transporting of the bells and new fittings from our Works to the Church (including off-loading into the Church). **£1,444.00**

4) **Fit & able-bodied** local labour to assist with the hoisting and rehanging of the bells (minimum 3 persons). **£2,720.00**

5) Lodgings and all meals to be supplied for our Bellhanger(s) whilst on site **£48.00 per day per man**

6) Re-use the existing bell ropes if in good order at the time of the works commencing. **£1,624.00**

HEALTH AND SAFETY

The deductions given in (1) and (4) assume that we will only send one/two Bellhanger(s). If the number of helpers is below the number requested we reserve the right to send an extra Bellhanger and adjust the deduction accordingly. For health and safety reasons someone **MUST** be present in the tower at all times when our Bellhanger is present. If this at any time is not the case he will leave the site and the deductions will be adjusted accordingly.

PLEASE NOTE THAT OUR INSURANCES COVER LOCAL PERSONS ASSISTING WITH THIS PROJECT UNDER THE INSTRUCTION OF OUR BELLHANGER(S) BUT NOT WORKING IN THE TOWER ON THEIR OWN. THE INSURANCE COVER IS SUBJECT TO SATISFACTORY COMPLETION OF A HEALTH, SAFETY AND MEDICAL FORM BY EACH ASSISTANT.

TO COMPLY WITH HEALTH & SAFETY LEGISLATION WE WILL SUPPLY HARD HATS FOR ANY VOLUNTARY LABOURERS. HOWEVER, THEY WILL BE REQUIRED TO SUPPLY THEIR OWN SENSIBLE PROTECTIVE CLOTHING AND FOOTWEAR. SOFT FOOTWEAR SUCH AS TRAINERS IS NOT ACCEPTABLE.

THE DIRECTORS AND STAFF OF WHITES OF APPLETON LTD. ACCEPT NO RESPONSIBILITY WHATSOEVER FOR ANY ON SITE WORKS UNDERTAKEN WHEN THEY ARE NOT IN ATTENDANCE.

A FACULTY MUST BE OBTAINED BEFORE ANY WORKS COMMENCE.

Church of
St.John the Baptist
Penshurst

Contents:

1. Report following inspection 5/12/12
2. Quotations
3. Possible sources of grant aid

Report

GENERAL

Access to the church is gained via a tarmac path leading up to a covered way, it being possible to bring a small vehicle to this point. One step leads up to the churchyard from where a path leads to the south porch which is reached by a further step up. The door from the porch to the nave measures 55" wide and thus any of the bells would easily pass through if required.

The church possesses a fine three-stage tower positioned conventionally at the west end of the building. There are large diagonal buttresses to the south-west and north-west corners with straight buttresses at the east ends of the north and south walls. A stair turret in the thickness of the south-west corner gives access to all upper levels. There is a clock dial on the south side. The tower has the benefit of a lightning conductor which runs to ground on the north side.

The ground floor area of the tower serves as a ringing chamber. At 30' 2 ¼" tall, the chamber is far too high for safe and comfortable rope handling. To compensate for the excessive height, a rope guide has been installed 17' 5 ¼" up which is a little on the high side but acceptable. The chamber is lit by a large west window below which is the tower west door, the sill of the window being 14' 7" up from floor level. The east tower arch spans almost the full width of the chamber and is open to the nave, the apex of the arch being 25' 7" up. There is one step down from the ringing chamber to the nave floor. In the south-east corner is a clock weight case. There are monuments to both the north and south walls, the top of the largest monument, on the south wall, being 12' 9" up from the floor. There is a hatchway in the ceiling on the west side. A door in the south-west corner leads to the stair turret, there being a walled up doorway about 11' up the turret which must have given access to a previous gallery or floor at that level.

The clock chamber is 12' 4 ¼" tall and is lit by glazed windows to all but the east side. A hatchway is framed in the floor on the west side. The clock is contained in an enclosed case in the south-east corner and is arranged to strike the hours as well as driving the external dial. In the north-east corner is an entirely independent chiming apparatus which is arranged to chime Cambridge quarters, this unit being hand wound. We understand that sadly, as a result of complaints about noise, the quarter-chime unit has in recent years been taken out of use though the hour strike remains in operation. The rope to the tenor is drawn over approx. 6" away from the vertical to the south-east, the seventh rope is drawn approx.12" to the west, the fourth rope is drawn over 9" to the west, the third rope is drawn over 4" to the south, the second rope is drawn over 6" to the north and the treble rope is drawn over 7" to the south, the sixth rope being the only one of the eight to fall more or less plumb. All the drawing over of the ropes has been done without the benefit of either pulleys or flapping boards as a consequence of which the drawn ropes are cutting heavily into the floor boards. Looking down the rope holes into the ringing chamber below, it is apparent that further drawing over of the ropes has been carried out via the rope guides, the tenor rope being drawn over approx. 9" to the east, the seventh 9" to the west, the sixth about 3" to the north, the fifth about 4" to the west, the fourth about 3" to the south, the third about 10" to the south, the second about 4" to the east and the treble about 4" to the east. The fact that all the ropes are drawn over in varying degrees, some significantly so, and that some are drawn in more than one direction,

must inevitably mean that the handling qualities and general ease of ringing will be significantly compromised.

The bellchamber is about 18' tall and there are sound openings to each of the four sides, all entirely boarded over. The boards are very thin and whilst they will offer weather protection and exclude birds, such thin boards will do very little to attenuate the sound of the bells which seems to have been the objective. A timber joist spans centrally east-west with a much smaller joist spanning over it in the east-west direction. The north-south joist is considered too insubstantial to be safely used to support lifting tackle and there are no safe lifting points over the six largest bells.

We saw no signs of any significant structural distress which might be attributed to the ringing of the bells.

BELLS

bell	diameter	weight	note	date	founder
Tenor	46 ½"	17-2-11	Eb	1619	Joseph Hatch, Ulcombe
Seventh	44"	14-0-6	F	1896	Mears & Stainbank, Whitechapel
Sixth	40 3/8"	10-3-7	G	1896	Mears & Stainbank, Whitechapel
Fifth	36 ¾"	7-2-26	Ab	c.1470	John Kebyll, London
Fourth	33 5/8"	6 ½ cwt	Bb	1802	Thomas Mears I, Whitechapel
Third	32 ½"	6 ¾ cwt	C	1701	Richard Phelps, Whitechapel
Second	31 1/8"	6-0-3	D	1896	Mears & Stainbank, Whitechapel
Treble	30 1/8"	5-3-19	Eb	1896	Mears & Stainbank, Whitechapel

Even a cursory glance at the diameters and weights of the bells makes it clear that the sizes of the bells do not grade well. The tenor and to a lesser extent the seventh are on the small and therefore thin side, the keynote being a semi-tone lower than is ideal for bells of this size. The diameters and weights of the smallest three bells by comparison are on the large side, these three bells consequently being on the thick side.

The tenor, fifth, fourth, third, second and treble were made with canons or supporting loops, those to the tenor and third having subsequently been removed. The seventh

and sixth bells were made with Doncaster canons. The tenor, fifth, fourth and third were made with cast-in crown staples, the crown staple being the part from which the clapper hangs. The seventh, sixth, second and treble were made with centre holes for independent crown staples. The original cast-in crown staples to the tenor, fifth, fourth and third have subsequently been cut away and centre holes drilled for independent crown staples, though portions of the original staples are thought to remain in the crowns of the bells.

The tenor, fifth, fourth and third have all been quarter-turned in the past in order to bring fresh faces to the blows of their clappers. Wear at the present strike points of the eight bells is as follows, all expressed as a percentage of total thickness; tenor 5%, seventh 11%, sixth 12%, fifth 11%, fourth 12%, third 4%, second 10%, treble 8%. 10% wear is generally accepted as the wise maximum at which point remedial action should be taken and it follows that five of the bells are at or past that point with the treble fast approaching it.

The fourth bell has been chip-tuned at some time, probably by its founder. The treble, second, sixth and seventh were machine-tuned by their founder. The frequencies of the principal and main partial tones are as follows, all expressed to the nearest half hertz;

Bell	Hum	Fundamental	Third	Fifth	Nominal
Tenor	171.5	335	390	?	629.5
Seventh	195.5	350.5	432	559	714
Sixth	221.5/218.5	396.5	483.5	584.5	795.5
Fifth	218.5/221	433/426	514.5	650.5	845
Fourth	272	464	592.5	764	969.5
Third	297.5	520.5	667	837	1079
Second	312.5	545	707	?	1181
Treble	353	582.5	771.5	?	1277

Consideration of the nominal or principal notes shows that they are by no means in accurate alignment. Taking the nominal of the tenor as the reference point as is most usual, the seventh is sharp, the sixth is almost in line, the fifth is a little sharp, the fourth is extremely sharp, the third is extremely sharp, the second is a little flat and the treble is very sharp. It is the alignment of the various partial tones or harmonics which determines the tonal quality or timbre of any musical instrument, bells being no exception. The alignment of the fundamental is the most critical to the tone of a bell and should be an exact octave below the nominal or half its frequency, a sharp fundamental making a bell sound very acid and a flat fundamental imparting a sour quality to the sound. The hum note is the next in importance and should be two octaves below the nominal or one quarter of its frequency, sharp hum notes tending to reduce resonance and fullness of tone, flat hum notes being mercifully rare. The third harmonic should normally be a minor third above an accurately aligned fundamental although some sharpness of this harmonic can be a benefit as it imparts brightness to the sound. The fifth harmonic is generally very weak in amplitude and not normally a major cause for concern. Analysis of the various partial tones shows the following to be the case;

Tenor
The hum note is approaching two semi-tones sharp, the fundamental is a semi-tone sharp, the third harmonic is approaching a semi-tone sharp and the fifth harmonic is too weak in amplitude to be reliably measured. The very sharp fundamental to this bell is unfortunate and this combined with the sharp hum note combine to produce a bell which is tonally only fair. In considering this it should be noted that it is the tonal quality of the tenor more than any other which determines the musical quality of a peal of bells.

Seventh
The hum note is one and a half semi-tones sharp, the fundamental is a little flat, the third harmonic is somewhat sharp and the fifth harmonic is approaching a semi-tone sharp. Tonally this bell is quite fair.

Sixth
The hum note is split i.e. there are two opposing notes a few hertz apart, that with the strongest amplitude being almost two semi-tones sharp. The fundamental is virtually in line, the third harmonic is somewhat sharp and the fifth harmonic is a little flat. In terms of its tonal quality, the excellent alignment of the fundamental is a major advantage though this is tempered by the sharp hum note. Overall tonally this bell is pretty fair.

Fifth
The hum note and fundamental are both split, those with the strongest amplitude being respectively half a semi-tone sharp and nearly half a semi-tone sharp. The third harmonic is somewhat sharp and the fifth harmonic is somewhat sharp. The split hum note and fundamental are no doubt the result of the bell being of inconsistent thickness around its diameter, the effect of this being to produce strong and unpleasant beats. Tonally this bell is poor.

Fourth
The hum note is two semi-tones sharp, the fundamental is approaching a semi-tone flat, the third harmonic is somewhat sharp and the fifth harmonic is nearly a semi-tone sharp. With a flat fundamental and a sharp hum note, it is no surprise to find that tonally this bell is only fair.

Third
The hum note is approaching two semi-tones sharp, the fundamental is over half a semi-tone flat, the third harmonic is approaching a semi-tone sharp and the fifth harmonic is over half a semi-tone sharp. Like the fourth, this bell is tonally only fair.

Second
The hum note is a semi-tone sharp, the fundamental is well over a semi-tone flat, the third harmonic is slightly sharp and the fifth harmonic is too weak in amplitude to be reliably measured. With a significantly flat fundamental it is no surprise to find that tonally this bell is quite fair rather than good or better.

Treble
The hum note is approaching two semi-tones sharp, the fundamental is well over a semi-tone flat, the third harmonic is somewhat sharp and the fifth harmonic is too

weak in amplitude to be reliably measured. Like the second, tonally this bell is quite fair rather than good or better.

Taking everything into account and as a result of the various inadequacies in the tuning of these bells, the overall musical effect when the eight bells are rung together will inevitably fall far short of the best which could be achieved.

All the bells seem to be sound though only complete dismantling would allow a full examination to be made.

The fifth bell is listed by the Church Buildings Council as being worthy of preservation.

FRAME

The bellframe was constructed and installed by Thomas Blackbourn of Salisbury in 1896. The frame consists of cast-iron lowside framesides bolted down to an oak grillage. The frame is supported principally by three oak joists which span the tower east-west, the north and south sides being supported directly upon offsets in the tower walls.

The fixings to the framesides show no obvious sign of having been tightened in recent years and there are indications that some of the framesides may be moving slightly on the sills when the bells are rung.

The framesides are suffering from surface corrosion but are otherwise sound.

Those timber parts of the bellframe which could be inspected appeared to be in good order.

Although cleaner than a good many others, there is nevertheless a fair amount of dust and debris about the bellchamber. The lack of decent lighting and a power socket in the bellchamber hardly encourages good maintenance of the installation.

FITTINGS

The ringing fittings are in essence those provided by Thomas Blackbourn in 1896, the exceptions being the clapper assemblies, gudgeons and bearings and the pulley assemblies, all of which have been replaced at various times over the intervening years.

The bells hang from elm headstocks fitted with plate gudgeons, those to the tenor and seventh running in single row semi self-aligning ball bearing races with the remainder running in double row fully self-aligning ball bearing races, all the bearings being housed in sealed cast-iron plummer blocks. The wheels are of traditional timber construction and the pulleys consist of nylon sheaves each running upon a pair of sealed ball bearing races in timber boxes, the exception being the backstroke sheaves to the treble and fifth which are of hardwood. All the bells are fitted with conventional stays, sliders and runner gear. The clappers are of wrought iron and hang from independent crown staples.

Like all the ironwork to the bell installation, the strapwork to the headstocks is showing signs of surface corrosion the headstocks otherwise being in very fair condition. Measurement and subsequent calculation has shown that the hanging radii are excessive, some significantly so, and that they are not well graded. Not only will the excessive hanging radii make the bells go harder than need be the case, it also means that the bells will generate larger dynamic loads with which the bellframe and tower have to cope.

The north gudgeon pin to the fourth appears to be slightly loose, the gudgeons otherwise appearing to be sound and tight.

Without dismantling we cannot comment upon the condition of the internal bearing components. It is, however, likely that unless the bearings have been overhauled in the last twenty years or so the lubricant will now be becoming denatured. It should also be noted that although strong enough the design of bearing fitted to the tenor and seventh is in terms of go and ease of ringing inferior to the more recent design of bearing fitted to the remaining bells.

The wheel to the fifth is slightly loose on its headstock. The seventh wheel rim has suffered damage in the past as a result of coming into contact with a clock hammer. The damage has been repaired and appears satisfactory. Although the nails with which their rims were assembled are beginning to show signs of corrosion the remaining wheels are in fair condition for their age. Measurement and subsequent calculation has shown that the wheel diameters are less than ideal.

The nylon pulley sheaves are all grooved in varying degrees, those to the tenor and sixth being particularly poor and near to cutting right through.

The stays, sliders and runner gear are in very fair condition.

The clapper bushes to the tenor, seventh, sixth and treble are showing signs of wear. The clapper hinge pins to the sixth and fourth are loose in their respective staples.

One of the clock quarter chime hammers to the seventh has been very badly damaged after coming into contact with the wheel while the bell was being swung. We are told that this occurred as a result of human error, the hammers not having been pulled off prior to the commencement of ringing. As things stand the hammer cannot be used.

RECOMMENDATIONS

BELLS

As part of any major work to these bells, we strongly recommend that all remaining parts of the original cast-in crown staples be cut away, drilled out and removed from the crowns of any of the bells which still have them. By this means the chances of any of the bells becoming cracked in its crown would be greatly reduced.

The degree of wear to the majority of the bells is now so severe as to require remedial action. The solution would be to eighth-turn the bells to bring fresh surfaces to the blows of the clappers. This will require rehanging with new headstocks.

There can be no doubt at all that the musical qualities of these bells could be hugely improved by careful attention under the tuning machine. Unfortunately if the fifth bell were to be left in the peal untuned it would so restrict what could be done by way of tuning of the other bells, in particular the correction of the very sharp fundamental to the tenor, as to make tuning a waste of time. The starting point must therefore be the listed fifth bell, there being a natural presumption against tuning any listed bell. While there can be no doubt that at least one of the amenity bodies routinely consulted as part of any faculty application would recommend against tuning, we nevertheless feel that a strong case exists for the tuning of this bell. If a faculty could be obtained for its tuning it would be entirely transformed from being much the worst bell in the current peal to one of the best. If a faculty for tuning the fifth cannot be obtained and the remaining bells are to be tuned, it will be necessary to remove the bell from the peal and replace it.

The poor grading of the diameters and weights of the smaller bells in particular is unfortunate. Whilst wholesale replacement of the three smallest bells would be the ideal solution it would be pretty radical and in our view would not be justified. The alternative which we propose would be to remove the third bell from the peal and tune the current treble and second down to be respectively the second and third in eight, tuning to include some skirting of the current treble both to improve it tonally and also to improve the grading. In tuning the two bells down in this way, not only would their diameters and weights be far better aligned but their musical qualities would be greatly improved. This would then leave only the provision of a new treble of the correct size to complete the octave, one possibility being to have the current third recast to be the treble in eight with the surplus metal helping to offset the cost of its recasting.

FRAME

All fixings to the bellframe should be thoroughly tightened with particular attention to the bolts which secure the framesides to the oak grillage.

All ironwork should be thoroughly cleaned down and descaled, primed with a heavy zinc-rich primer and then painted with two coats of enamel.

The whole of the bellchamber should be thoroughly cleaned out, all debris removed and a powerful vacuum cleaner used to remove all dust. Particular attention should be given to the areas between the oak grillage and the tower walls, dust build-up in such areas tending to encourage damp and consequent decay.

FITTINGS

Noting that the bells are now badly in need of eighth-turning due to excessive wear at their strike points, we regret to have to advise that the only sensible course of action will be to rehang them with new headstocks. In replacing the headstocks, it is vital that the opportunity be taken to bring all the hanging radii into perfect alignment in

order minimise both the effort required of the ringers and the dynamic loads with which the tower and bellframe have to cope.

The bearings to the six smallest bells could be overhauled and fitted to the new headstocks after replacement of any parts found to be defective. Entirely new bearings should be fitted to the largest two bells of the same type already fitted to the other six bells.

With the hanging radii brought into good alignment, it will be necessary to adjust the wheel diameters to suit, the relationship between the two being vital to good performance. The wheels would in any case benefit from being rebuilt with new rims and this would be the ideal time to achieve both ends.

The pulleys should be entirely replaced. In replacing the pulleys, the opportunity should be taken to completely revise the rope paths down through the tower to improve the rope circle and more importantly to reduce or eliminate any drawing over of the ropes from the vertical. Not only will improving the rope paths make the bells easier for the ringers to handle, it will also significantly reduce wear to the ropes. Where any rope is drawn away from the vertical, this should be achieved using pulleys. Where the ropes pass through the clock chamber they should be fitted with flapping boards to further improve the handling qualities of the bells.

New stays and runner boards will be required to suit the new headstocks.

The lengths of the crown staples will need to be completely revised in order to bring the clapper throws into perfect alignment with the new hanging radii. New clappers will be required to match the revised staple lengths.

If the clock quarter-chime is to be brought back into use it will be necessary to straighten and repair the damaged hammer to the seventh. We would also urge the installation of a proper clock hammer pull-off mechanism be provided. The easiest way of achieving this would be to fit electrically operated pull-off devices to both the clock and chiming machine and arranging for them to be operated by a single switch in the ringing gallery. The control system would also incorporate a time switch which could be set up to provide automatic night time silencing should that be required.

RINGING CHAMBER/GALLERY

We understand that there are plans to install a new ringing gallery at the base of the west window. According to our measurements this would create a ringing chamber 17’ 11” which would be only slightly taller than the optimum. If the new floor could be installed just above the sill that would be a great advantage and this would also allow some light from the window to enter the new ground floor room. If, however, the floor is to be installed any lower, rope guides will continue to be required.

The reduction in the overall length of rope between the bells and ringers as a result of the introduction of a ringing gallery would be very welcome in helping to make the bells easier to ring, the resulting length being just about ideal. A further advantage is that the bells would be somewhat louder when heard from the new higher level, the bells being rather quiet in the current ringing chamber. We must, however, sound a

note of caution as the current rope circle has been achieved only as a result of excessive and poorly thought out drawing over of the ropes in both the clock chamber and into the rope guides. Ringing from the proposed gallery without attending to the roping issues would make the bells extremely difficult to handle and the ringing circle and rope positions would be unacceptable. Attending to the roping issues as recommended during the rehanging and restoration of the ringing fittings would, by comparison, produce a first class rope circle and excellent handling characteristics. It follows that the two jobs must be done as a package.

In designing the new gallery, proper consideration must be given to providing sufficient space for the ringers, both those actually ringing and those sitting out or standing behind others who may be learning. We would urge that the gallery be taken as far to the east as possible and certainly at least as far as the mid-point under the east tower arch.

The east tower arch will need some form of protection and we understand that a glass panel is to be installed. The parish might like to consider entirely glazing the arch as this would allow the new ringing chamber to be heated in winter and would also help reduce heat loss from the body of the church, open church towers making splendid chimneys.

Good lighting will be required, it being important to install any fittings well above the line of sight of the tallest ringer, uplighters being one possibility. Strip lights should be avoided as they can cause difficulties for some ringers. At least one power point should be provided in the ringing gallery. Whilst considering electrical requirements, the provision of improved lighting and a power outlet in the bellchamber should be considered essential to the safe maintenance of the bell installation. Switching for the ringing gallery lights should be under the direct control of the ringers in order to avoid the risk of the ringers being plunged into darkness. In similar vein, the bellchamber lighting should be switched from there.

SOUND CONTROL

It is understood that there have been complaints in the past about excessive sound outside the tower, in particular from the nearby rectory. Although the sound openings are boarded over, the boards are so thin as to make them pretty ineffective. The installation of a sound control system which can be easily opened and closed would seem to be the best way forward.

The first principal to consider is the desirability of avoiding a direct path from the lip of a bell when raised for ringing and the ear of the listener, this applying whether or not sound control shutters are to be provided. With a peal of bells it is also desirable for the sound of the bells to mix before exiting the tower as this will produced a far more balanced sound outside the tower. At Penshurst these two principals could be satisfied by boarding up the sound openings to a height just above the lip of the tenor when raised for ringing. The boarding will, however, need to be far more effective than the current arrangement. We recommend fitting 18mm thick plywood panels with their internal surfaces panelled with Rockfloor RC65 sound insulation panels and with a further layer of plywood such that the Rockfloor forms a sandwich. It is vital that no air gaps are left around the panels after they have been fitted. With the sound

openings boarded in this way the upper parts would be left completely open thus allowing a full and well balanced sound to be heard outside without any harshness.

If it is desired to be able to fully close down the sound of the bells, perhaps for peal attempts or other longer periods of ringing, hinged doors could be provided for the upper parts of the sound openings. These panels should be of the same construction as for the new boarding to the lower parts of the sound openings. The doors could be arranged to be controlled from the ringing chamber using ropes and pulleys.

CONCLUSION

The initial reason for our visit was to consider the proposed creation of a new ringing chamber higher in the tower. Our conclusion is that in general terms the proposed new ringing chamber would be a considerable improvement and is to be strongly supported. Unfortunately, however, the roping issues must be addressed if the bells are not to be made difficult or impossible to ring by the addition of the proposed ringing gallery. Some improvements to the roping could be achieved using the majority of the current ringing fittings but the best solution could only be achieved as part of the rehanging of the bells with new headstocks and revised wheel diameters. The fact that the bells in any case need to be rehung as part of their eighth-turning makes it all the more obvious that all tasks should be undertaken simultaneously. Additionally, it would surely be a missed opportunity of epic proportions not to attend to the tuning and grading issues while the bells are dismantled for other work.

With the bells retuned, properly graded and rehung with new fittings, all roping issues properly dealt with and the bells rung from the proposed new ringing gallery, the parish would be provided with a fine musical peal of bells which would be easy to handle and strike well. As such it would be difficult to overstate the improvement this would represent over the current position. With the recommended work complete the bells would in mechanical terms be in essentially new condition and with proper maintenance the bell installation might then be expected to serve the parish well for many decades to come without further major work.

I trust that this report is of assistance. If, however, there is anything further we can do to assist at this stage, do please let me know.

Andrew Nicholson

Managing Director

09 June 2016

Quotations

QUOTATION NO.1 – EIGHTH-TURN THE BELLS, REHANG WITH MAINLY NEW FITTINGS AND ADJUST THE ROPE FALLS DOWN THROUGH THE TOWER IN PREPARATION FOR RINGING FROM THE NEW GALLERY

Travel to the church with all necessary tools and equipment.

Dismantle the bells and ringing fittings, lower all to the ground and bring back to our works.

Remove and discard the ringing fittings, retaining only the bearing plummer blocks to the front six.

Take detailed measurements from the inside and outside surfaces of the bells. From those measurements calculate new leading dimensions such as to bring the hanging radii, wheel diameters and clapper throws into perfect alignment.

Cut away, drill out and entirely remove all remains of the original cast-in crown staples from the crowns of those bells which still have them. Neatly remove the canons from the seventh, sixth, fourth, second and treble. Cast resin pads onto the crowns of all eight bells true and level ready to receive new headstocks, the canons to the fifth being left in-situ.

Make a new headstock for each of the bells, all fitted with steel gudgeons set in true alignment, that to the fifth to be of canon-retaining type and the remainder to be complete with staple adjusting screws for setting and maintaining even clappering. Send the headstocks for hot-dip galvanizing. Fit the headstocks to the bells, stock down and balance, turning the bells to present unworn surfaces to the blows of their clappers. Drill through and fit galvanized steel supporting bolts together with insulation washers for fitting between the crowns of the bells and the bolt heads.

Wash out the plummer blocks to the six smallest bells and fit new seals and premium quality bearing races. For the largest two bells provide new heavy duty double row self-aligning ball bearings housed in cast iron plummer blocks, all to the same design as those to the front six. Fit the bearings to the new headstocks and charge with the correct lubricant before closing.

For the tenor and seventh make heavy steel bedplates for fixing to the frameheads to which the new plummer blocks may be secured.

Remove and discard the soles and shrouds to the wheels. Alter the spokes and wheel eyes as necessary to suit the new headstocks and to produce the correct diameters. Fit new steam bent ash soles and oak shrouds, all secured with stainless steel screws. Provide all new steel angle cleats and braces. All wheel securing bolts to be of hot-dip galvanized steel.

Make completely new pulleys consisting of cast nylon sheaves each running on two ball races all housed in hardwood boxes. The pulleys to be such as to suit entirely revised rope paths down through the tower.

Make new stays and sliders of finest quality ash, together with new hardwood runner boards and steel slider pins.

For each of the bells make a completely new clapper and crown staple consisting of a malleable iron clapper fitted with a Tufnol bush resiliently mounted in neoprene rubber, together with an independent crown staple fitted with a stainless steel hinge pin and with an insulation pad for fitting between the staple and the crown of the bell.

All galvanized steelwork to be etch-primed and the remainder primed as appropriate with a heavy zinc-rich primer and all then painted with two coats of top-quality machinery enamel.

All timber parts of the ringing fittings to be treated with a heavy application of exterior grade Cuprinol wood preservative.

Transport all to the church.

Thoroughly tighten the whole of the bellframe with particular attention to the fixings to the frameside feet. Fit the bedplates to the tenor and seventh to the frameheads true and level and secure in position.

Hoist the bells into the tower and hang true and level in the bellframe. Assemble all the ringing fittings, test each bell and adjust for even striking and correct set at handstroke and backstroke.

Drill down through the floors for the bellropes in their new positions, the rope paths being carefully redesigned to remove and wherever possible eliminate all drawing over of the ropes from the vertical while at the same time providing a first class rope circle in the new ringing gallery. Fit turned and polished hardwood rope bosses to the new rope holes. Where any of the ropes is drawn over, this to be achieved using drawing pulleys. All eight rope runs down through the clock chamber to be fitted with flapping boards to further assist in providing first class rope handling characteristics.

Repair and straighten the damaged chiming hammer to the seventh bell. Alter all the clock and chiming hammer positions as necessary to suit the new hanging radii of the bells. Test and commission all the hammers.

Fit the existing ropes, try out the bells with the local ringers and leave ready for use.

We are prepared to undertake the whole of the above works, including time on site and in our works, materials, transport, mens' accommodation and expenses etc., for the sum of:

£46598

SUPPLEMENTARY QUOTATION NO.1A – TUNE ALL EIGHT BELLS

Transport the bells direct from the church to the bellfoundry in London and there have them carefully attended to under the tuning machine, all eight bells to be so tuned. Transport the bells back to our works.

If done in conjunction with quotation no.1, we are prepared to undertake the whole of the above works for the sum of:

£5376

SUPPLEMENTARY QUOTATION NO.1B – REPLACE THE FIFTH BELL

After dismantling, leave the fifth bell at the church for storage, display or disposal by the parish.

Have a new bell cast from copper and tin to replace the existing fifth bell. The new bell to be carefully designed, cast and accurately harmonically tuned to agree in pitch and style with the other bells after their tuning.

If done in conjunction with quotation no.1 and supplementary quotation no.1A, we are prepared to undertake the whole of the above works for the sum of:

£10509

SUPPLEMENTARY QUOTATION NO.1C – REMODEL THE THREE SMALLER BELLS

Tune the current treble and second down to be the second in third of the octave, at the same reducing the diameter of the treble to further improve the weight grading.

Have the third bell recast to a smaller diameter to form the treble in eight, the existing inscription being reproduced in facsimile upon the new bell. The new bell to be carefully designed, cast and accurately harmonically tuned to agree in pitch with the other bells after their tuning.

If done in conjunction with quotation no.1, supplementary quotation no.1A and supplementary quotation no.1B, we are prepared to undertake the whole of the above works for the sum of:

£3330

SUPPLEMENTARY QUOTATION NO.1D – CLOCK HAMMER PULL-OFF MECHANISM

Provide electrically operated clock and chiming hammer pull-off mechanisms together with all necessary controls.

Install the mechanisms in the clock chamber and connect up to the clock and to the chiming machine. Install the control unit in the ringing chamber. Leave all ready for connecting up by the electrician appointed by the parish.

Set up and commission the equipment and leave ready for use.

If done in conjunction with quotation no.1, we are prepared to undertake the whole of the above works, including time on site and in our works, materials, transport, mens' accommodation and expenses etc., for the sum of:

£1868

SUPPLEMENTARY QUOTATION NO.1E – CLEAN AND PAINT BELLFRAME AND CLEAR OUT BELLCHAMBER

Thoroughly clean down and descale all ironwork to the bellframe. Prime all with a heavy zinc-rich primer and paint with two coats of top-quality machinery enamel.

Clear away all rubbish from the bellchamber with particular attention to the areas between the walls and the bellframe. Vacuum the whole of the bellchamber and leave all clean and tidy.

If done in conjunction with quotation no.1, we are prepared to undertake the whole of the above works, including time on site and in our works, materials, transport, mens' accommodation and expenses etc., for the sum of:

£5701

INSCRIPTIONS

A short inscription may be cast in relief upon any new bell at an additional cost of £3.10 per character. Such an inscription might record the gift of a bell perhaps as a memorial or might mark an event of local or national importance.

EXCLUSIONS

Quotation no.1 specifically excludes the following;

1. Preparing the hatchways in the various floors ready for use including moving aside any light fittings and their associated wiring.

2. The provision of a suitable arrangement of lifting beams above the bells from which we can safely sling our lifting tackle. We would be pleased to discuss our requirements in detail.

Supplementary quotation no.1D excludes all necessary electricians' work involved in providing a mains supply to the equipment in the clock chamber together with wiring from there down to the control position in the ringing chamber.

POSSIBLE REDUCTIONS

If the parish is able to provide the fit, able-bodied assistance of three persons to assist with all the site work, we would be pleased to make a reduction as follows;

Quotation no.1	£8106
Supplementary quotation no.1E	£2266

In considering the provision of such assistance the parish must realise that the work would be dirty and would involve a degree of heavy lifting and working at height, for all of which those assisting must be prepared and suited. Provided certain criteria can be met, those assisting with the work would be covered under the terms of our employers' liability insurance.

TERMS

For the above quotations we would require one third payment with order, one third upon commencement, with the balance due immediately on completion of the works according to this specification.

All prices are based upon current costs but will be held firm if accepted in writing within 90 days.

VAT

VAT is chargeable in addition as applicable at the rate current at the time. Under current guidelines the whole of these works must be standard-rated, currently at 20%.

GUARANTEE

For these works we would be pleased to offer a full three year guarantee, the only exceptions being those items subject to wear and tear such as stays and sliders, except where failure is due to faulty workmanship or materials. All guarantees are given on the basis that the installation would be subject to full and rigorous maintenance and in particular that all fixings are kept fully tightened at all times.

FACULTY

A faculty will be required before these works may be commenced.

INSURANCE

We carry full public liability insurance in the sum of £5,000,000.

I trust that the above quotation is of interest and we look forward to being favoured with your valued instructions.

Andrew Nicholson

Managing Director

18th December, 2012.

THE BELL INSTALLATION AT THE CHURCH OF SAINT JOHN THE BAPTIST, PENSHURST, KENT.

4th March, 2013



ALL RECOMMENDATIONS GIVEN IN THIS REPORT ADHERE TO THE 1993 CODE OF PRACTICE FOR THE CONSERVATION OF CHURCH BELLS AND BELL FRAMES ISSUED BY THE COUNCIL FOR THE CARE OF CHURCHES

A FACULTY MUST BE OBTAINED BEFORE ANY WORKS COMMENCE

WHITES OF APPLETON LTD. CHURCH BELLHANGERS,
69 EATON RD, APPLETON, ABINGDON, OXON. OX13 5JJ
TEL. (01865) 862549 FAX. (01865) 864969
Email:-bells@whitesbellhangers.co.uk
Web site:- www.whitesbellhangers.co.uk

The western tower contains a ring of eight bells in the key of E-flat plus $^{18}/_{100}$ of a semitone, details as follows:

BELL	DIAMETER	DATE	FOUNDER
Tenor	3'- 10$^{1}/_{2}$"	1619	Joseph Hatch
7th	3'- 8"	1896	Mears & Stainbank
6th	3'- 4"	1896	Mears & Stainbank
5th	3'- 0$^{5}/_{8}$"	*circa* 1370	Stephen Norton
4th	2'- 9$^{1}/_{2}$"	1802	Thomas Mears I
3rd	2'- 8"	1701	Richard Phelps
2nd	2'- 6$^{1}/_{2}$"	1896	Mears & Stainbank
Treble	2'- 6"	1896	Mears & Stainbank

BELLS

The 5th bell is listed in the Church Buildings Council "Schedule of Bells for Preservation" in the Rochester Diocese.

The 7th, 6th, 4th, 2nd and treble retain their canons, those of the 7th and 6th being of the "Doncaster" type. The canons have been removed from the crowns of the tenor, 5th and 3rd bells.

The cast-in crown staples have been removed from the tenor, 5th, 4th, 3rd, 2nd and treble bells but some roots remain. The 7th and 6th were cast without cast-in crown staples. Cast-in crown staples and their roots are the principal cause of bells becoming cracked in the crown due to the corroding iron expanding within the brittle bell metal.

At the time of inspection and with the headstocks in place, the bells appeared to be sound and free from cracks.

The 4th and 3rd bells have been quarter turned. The tenor and 5th bells have been sixteenth turned. The remainder are still in their original unturned positions. All are well worn in the soundbow areas where struck by their respective clappers.

The 7th, 6th, 2nd and treble bells have been machine tuned in the soundbow areas. The 4th and 3rd bells have been chip tuned. The 5th bell is a maiden casting (i.e. not tuned). The tenor has been lightly skirted in an attempt to raise its strike note.

The ring as a whole is not well in tune, the tenor being flat of the required key note. The 4th, 3rd and, to some extent the treble, are all very sharp. The partial tones of all eight bells are somewhat wild resulting in various qualities of tone and a less than cohesive sounding ring.

BELLS (Contd.)

The complete table of principle partials are as follows:-

BELL	HUM	PRIME	TIERCE	QUINT	NOMINAL	PITCH
	Cycles per second (Hz.)	Cycles per second (Hz.)	Cycles per second (Hz.)	Cycles per second (Hz.)	Cycles per second (Hz.)	+/- cents
Tenor	171	335	389.5	509	629	Eb(2) +18
7th	195.5	350.5	431.5	558.5	713	F(2) +35
6th	221	396	483	635	794	G(2) +21
5th	218	433	515	649.5	844	Ab(2) +27
4th	272	463.5	591.5	764	969.5	Bb(2) +68
3rd	297.5	521	666.5	835.5	1079	C(3) +53
2nd	312	545	706.5	938	1181	D(3) +9
Treble	352.5	581	771	1180	1275.5	Eb(3) +42

Using the pitch of the tenor as the datum (629cps) and Just Intonation, the 7th bell is 5.38hz. sharp, the 6th 7.75hz. sharp, the 5th 5.33hz. sharp, the 4th 26.00hz. sharp, the 3rd 30.67hz. sharp, the 2nd 1.63hz. sharp and the treble 17.50hz. sharp.

BELL FRAME

The bell frame was made by Thomas Blackbourne of Salisbury in 1896. It consists of long-headed low-sided cast iron framesides bolted to an oak foundation.

The frame is supported by three large oak beams spanning the tower in an east-west direction and also by offsets in the north and south walls. There are floor boards in the base of the frame but these are not stable in some areas.

From north to south, the 3rd, 4th, tenor and 7th bells swing side-by-side in an east-west direction in the centre of the tower. The 2nd and treble bells swing mouth-to-mouth in a north-south direction on the western side of the tower. The 5th and 6th bells swing mouth-to-mouth in a north-south direction on the eastern side of the tower.

The frame is in good order but will require repainting within the next few years.



A view of the bell frame looking north-east.

RINGING FITTINGS

Most of these are contemporary with the bell frame and are as follows:

Headstocks & Bearings

The headstocks are of elm and are fitted with plate gudgeons. All are twisted to some degree, taking the gudgeons out of alignment. Woodworm is evident in places and some minor splits are evident.

The gudgeons revolve in self-aligning ball bearing units. Those of the front six are of a modern double-row design and other than requiring re-greasing are in good order. Those of the 7th and tenor bells are of an older single-row design.

Supporting Ironwork

The 4th, 2nd and treble bells are supported by traditional canon brackets, straps and copses. The tenor, 5th and 3rd bells are each supported by four bolts through the crown. The 7th and 6th bells are each supported by a pair of V-bolts and copses.

Clappers & Staple Units

All clappers are of wrought iron. They consist of older C19th clappers with more recent tops forge welded to the older iron. The bushes are dry and require lubricating. There is moderate play in the bushes with some side-play but very little vertical play.

The clappers are suspended from independent staple units. Those of the front four bells are of fabricated steel and those of the back four bells are of cast iron.

Wheels

These are of traditional pattern and made of oak, elm & ash with two rod braces on each. The rims are in poor condition due to the weakness of the shrouding and rusting of the iron retaining nails. The tenor wheel rim has been damaged by a clock hammer retaining spring and requires repair in the very near future. The centres are in fair condition.

Pulley Units

These consist of hardwood cages with nylon sheaves revolving on ball bearing races. The sheaves are grooved and in need of replacement.

Stays, Sliders & Runnerboards.

The stays are of ash and of the straight design. Those of the treble and 3rd are over-sized.

The steam-bent ash sliders are in fair condition, the pivots being somewhat worn.

The runnerboards consist of timber boards with cut-out slots. The slots are showing signs of wear.

RINGING FITTINGS (Contd.)

Bellropes

The bell ropes are in good condition and have pre-stretched terylene top ends. However, most of the ropes are dragged against the rope holes in the clock chamber floor, causing the rope holes to wear into slot-shaped openings.

Hammers

There are clock hammers on the 2nd, 3rd, 4th, 7th and tenor bells. The quarter chimes are currently out of action but the hours still strike on the tenor.



The tenor bell and its fittings.

RINGING FITTINGS

TOWER

The western tower is of stone and consists of three levels:-

- Ground floor ringing chamber with rope guides some 34'- 0" high.
- First floor clock chamber some 14'- 0" high.
- Second floor bell chamber some 15'- 7" high.

Access to the upper levels is by way of a stone spiral staircase in the south-west corner.

There is electric lighting in all chambers.

There are bell trapways in all floors.

CONCLUSIONS

The bells appeared to be sound at the time of inspection but they are worn in the soundbows and require turning. The ring as a whole is not well in tune. All have somewhat wild partial tones so retuning the ring would certainly be beneficial. Some of the cast-in staple roots remain and removing as much as practicably possible of these would reduce the chances of these bells becoming cracked in the crown.

The bell frame is in good order and will only require repainting in the next few years.

Many of the fittings have outlived their useful lives, particularly the headstocks and the wheels. The tenor wheel in particular is in need of attention to repair the rim which has been damaged. The existing pulley units could be re-used fitting new hard-wearing nylon sheaves. The rope paths could also be improved to reduce friction where the misaligned ropes are rubbing against the clock chamber floor.

RECOMMENDATIONS

TOWER

Trap ways should be prepared for easy lifting in all floors to enable the bells, frame and fittings to be removed from and returned to the bell chamber.

BELLS

All eight bells should have their centre holes enlarged for clapper adjustment and those with any remaining staple roots have as much of the cast-in crown staple roots removed as practicably possible to reduce the chances of these bells becoming cracked in the crown.

Carefully remove the canons from the crowns of the 7th, 6th, 4th, 2nd and treble bells and cast resin pads on the crowns of all bells to receive modern headstocks.

Drill the bells to receive their new support bolts, reusing any existing holes where possible.

Adjust the chief harmonic tones in each bell under the tuning machine to bring the ring as a whole into tune and their partial tones into better alignment.

When rehung, turn the bells to present unworn surfaces to the blows of their respective clappers.

BELL FRAME

All existing ironwork should be checked over and tightened.

The cast iron framesides should be painted in the next few years.

RINGING FITTINGS

These should be renewed as follows:-

- Cast iron box-section headstocks with fixed steel gudgeons, new heavy-duty double-row self-aligning ball bearings (in new totally enclosed dust-proof housings for the tenor and 7th and the refurbished existing housings for bells treble to 6th) and clapper adjustment screws to maintain even striking of clappers.
- Hot-dipped galvanised 8.8-grade steel supporting bolts, nuts, locknuts and insulation washers.
- Independent crown staple units, each fitted with a "maintenance free" stainless steel clapper pin.
- Ductile iron clappers, each with a machined Tufnol bush resiliently mounted in Neoprene rubber at its point of swing.
- Traditional hardwood wheels each fitted with two steel angle braces.
- Refurbished *existing* hardwood pulley units with *new* hard-wearing nylon sheaves.
- Slider pins with facilities to prevent the sliders from "lifting" and to take up wear at the pivot.
- Dry ash stays and sliders and hardwood runner boards.
- Ceiling and floor rope bosses.
- Rope chutes and guide pulley units in the clock room as required.
- A set of bellropes with pre-stretched terylene top ends and close-woven pure wool sallies (if required).

All timber fittings should be treated with insecticide and all non-galvanized metal ringing fittings painted with three coats of high quality exterior grade paint.



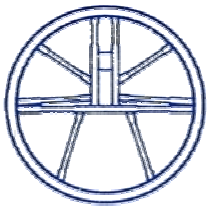
Proposed design of cast iron headstock for the eight bells.

Tel: 01865-862549

Fax: 01865-864969

VAT Reg. No. 311 5128 09

Directors
B. R. WHITE (Managing)
G. J. CLIFTON
J. A HASELDINE



Whites of Appleton Ltd
(Established 1824)
Church Bellhangers

69 EATON ROAD
APPLETON, ABINGDON, OXON
OX13 5JJ

e-mail: bells@whitesbellhangers.co.uk

Estimate

4th March, 2013

CHURCH OF SAINT JOHN THE BAPTIST

PENSHURST, KENT

LONG TERM WORKS – REHANG THE BELLS IN THE EXISTING BELL FRAME

DISMANTLING

Attend the Tower with our Bellhangers and all necessary tools and lifting equipment.

Dismantle the eight bells and their fittings, lower them to the ground and remove all old fittings from the Tower.

Transport the bells to our Works.

BELLS

Enlarge the centre holes for clapper adjustment in all eight bells.

Remove as much of the cast-in crown staple roots as practicably possible from all but the 7th and 6th bells to reduce the chances of these bells becoming cracked in the crown.

Carefully remove the canons from the crowns of the 7th, 6th, 4th, 2nd and treble bells and cast resin pads on the crowns of all bells to receive modern headstocks.

Drill the bells to receive their new support bolts, reusing any existing holes where possible.

Adjust the chief harmonic tones in each bell under the tuning machine to bring the ring as a whole into tune and their partial tones into better alignment.

When rehung, turn the bells to present unworn surfaces to the blows of their respective clappers.

BELL FRAME

Check over and tighten all ironwork in the bell frame.

Level, bed and securely bolt heavy steel bearing foundation plates to the top cills of the frame in the 7th and tenor pits to receive the new self-aligning ball bearing units.

RINGING FITTINGS

Fit as follows:-

- Cast iron box-section headstocks with fixed steel gudgeons, new heavy-duty double-row self-aligning ball bearings (in new totally enclosed dust-proof housings for the tenor and 7th and the refurbished existing housings for bells treble to 6th) and clapper adjustment screws to maintain even striking of clappers.
- Hot-dipped galvanised 8.8-grade steel supporting bolts, nuts, locknuts and insulation washers.
- Independent crown staple units, each fitted with a "maintenance free" stainless steel clapper pin.
- Ductile iron clappers, each with a machined Tufnol bush resiliently mounted in Neoprene rubber at its point of swing.
- Traditional hardwood wheels each fitted with two steel angle braces.
- Refurbished *existing* hardwood pulley units with *new* hard-wearing nylon sheaves.
- Slider pins with facilities to prevent the sliders from "lifting" and to take up wear at the pivot.
- Dry ash stays and sliders and hardwood runner boards.
- Ceiling and floor rope bosses.
- Rope chutes and guide pulley units in the clock room as required.
- A set of bellropes with pre-stretched terylene top ends and close-woven pure wool sallies (see "Possible Deductions" for re-using the existing bell ropes.

Treat all timber fittings with insecticide/preservative and all non-galvanised metal ringing fittings with three coats of high quality exterior grade paint.

REHANGING

Transport the bells and their fittings from our Works to the Church.

Attend the Tower with our Bellhangers and all necessary tools and lifting equipment.

Hoist the bells into the tower and hang them, complete with their fittings in the bell frame, firmly bolting the self-aligning ball bearing units to the steel bearing foundation plates.

Repositioning the rope-ways as required, fit guide pulley units and rope chutes as required in the clock room, fit new ceiling and floor rope bosses, adjust the existing rope guides (if the ringing chamber remains at ground floor level) set up the clappers for even clappering, test-ring the bells both singly and "in peal" and leave them in good order for full-circle ringing.

For the sum of:-

FORTY-FOUR THOUSAND & TWENTY-SIX POUNDS
(£44,026.00)
PLUS VAT

POSSIBLE EXTRA

1) If a ringing gallery is constructed, remove the existing rope guides. *This may be cheaper if carried out by the contractor installing the new ringing gallery.*

£1,171.00 plus VAT

NOTES

These estimate figures are based on current prices and are therefore subject to fluctuation.

EXCLUSIONS

This estimate specifically excludes the following:-

1) The construction and preparation for easy lifting of trap ways in all floors for the removal and return of the bells and fittings.

2) The de-rusting & painting of the existing bell frame ironwork. This would be considerably cheaper if carried out by a local tradesman or as a "self-help" exercise by the local ringers/congregation.

3) Any required works to the clock, including the clock hammers.

TERMS OF PAYMENT

1) 33% when the bells have been dismantled and transported to our Works.

2) 33% on completion in our Works.

3) The balance, less any deductions due, when works are complete in the Tower.

PLEASE NOTE THAT WE DO NOT ASK FOR ANY PAYMENT WITH ORDER.

POSSIBLE DEDUCTIONS.

1) **Fit & able-bodied** local labour to assist us with dismantling & lowering of the bells and old fittings (minimum 3 persons) so that we only need send one Bellhanger. **£672.00**

2) Transporting of the bells and fittings from the Church to our Works (including loading at the Church). **£400.00**

3) Transporting of the bells and new fittings from our Works to the Church (including off-loading into the Church). **£400.00**

4) **Fit & able-bodied** local labour to assist with the hoisting and rehanging of the bells (minimum 3 persons) so that we only need send one Bellhanger. **£1,440.00**

5) Lodgings and all meals to be supplied for our Bellhanger(s) whilst on site **£41.00 per day per man**

6) Re-use the existing bell ropes if in good order at the time of the works commencing. **£1,520.00**

HEALTH AND SAFETY

The deductions given in (1) and (4) assume that we will only send one Bellhanger. If the number of helpers is below the number requested we reserve the right to send an extra Bellhanger and adjust the deduction accordingly. For health and safety reasons someone **MUST** be present in the tower at all times when our Bellhanger is present. If this at any time is not the case he will leave the site and the deductions will be adjusted accordingly.

PLEASE NOTE THAT OUR INSURANCE'S DO NOT COVER ANY LOCAL PERSONS ASSISTING WITH THIS PROJECT OR WORKING IN THE TOWER ON THEIR OWN. ***THEIR INSURANCE COVER SHOULD BE ARRANGED BY OTHERS.***

TO COMPLY WITH HEALTH & SAFETY LEGISLATION WE WILL SUPPLY HARD HATS FOR ANY VOLUNTARY LABOURERS. HOWEVER, THEY WILL BE REQUIRED TO SUPPLY THEIR OWN SENSIBLE PROTECTIVE CLOTHING AND FOOTWEAR. SOFT FOOTWEAR SUCH AS TRAINERS IS NOT ACCEPTABLE.

THE DIRECTORS AND STAFF OF WHITES OF APPLETON LTD ACCEPT NO RESPONSIBILITY WHATSOEVER FOR ANY ON SITE WORKS UNDERTAKEN WHEN THEY ARE NOT IN ATTENDANCE.

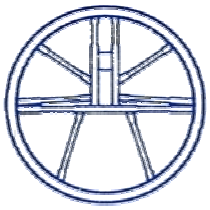
A FACULTY MUST BE OBTAINED BEFORE ANY WORKS COMMENCE.

Tel: 01865-862549

Fax: 01865-864969

VAT Reg. No. 311 5128 09

Directors
B. R. WHITE (Managing)
G. J. CLIFTON
J. A HASELDINE



Whites of Appleton Ltd
(Established 1824)
Church Bellhangers

69 EATON ROAD
APPLETON, ABINGDON, OXON
OX13 5JJ

e-mail: bells@whitesbellhangers.co.uk

Estimate

4th, March, 2013

CHURCH OF SAINT JOHN THE BAPTIST

PENSHURST, KENT

SHORT TERM WORKS – OVERHAUL THE EXISTING FITTINGS

DISMANTLING

Attend the Tower with our Bellhangers and all necessary tools and lifting equipment.

Remove the wheels and clappers from the bells, lifting the bells as required to remove the lower parts of the wheels.

RINGING FITTINGS

Re-bush the clappers each with a machined Tufnol bush resiliently mounted in Neoprene rubber at its point of swing.

Refurbish the staple units.

Re-rim the existing wheels and fit each with two new steel angle braces.

Treat all new/refurbished timber fittings with insecticide/preservative and all non-galvanised metal ringing fittings with three coats of high quality exterior grade paint.

REHANGING

Transport the fittings from our Works to the Church.

Attend the Tower with our Bellhangers and all necessary tools and lifting equipment.

Hoist the fittings into the tower and fit them to their respective bells.

Fit new hard-wearing nylon pulley sheaves to the existing pulley units.

Re-grease the main bearings.

REHANGING (Contd.)

Repositioning the rope-ways as required, fit guide pulley units and rope chutes as required in the clock room, fit new ceiling and floor rope bosses, adjust the existing rope guides (if the ringing chamber remains at ground floor level) check over and tighten all fittings and leave the bells in good order for full-circle ringing.

For the sum of:-

TWELVE THOUSAND & TWENTY-THREE POUNDS
(£12,023.00)
PLUS VAT

POSSIBLE EXTRA

1) If a ringing gallery is constructed, remove the existing rope guides. (*This may be cheaper if carried out by the contractor installing the new ringing gallery).*

£1,171.00 plus VAT

NOTES

These estimate figures are based on current prices and are therefore subject to fluctuation.

EXCLUSIONS

This estimate specifically excludes the following:-

1) The construction and preparation for easy lifting of trap ways in all floors for the removal and return of the wheels.

2) The de-rusting & painting of the existing bell frame ironwork. This would be considerably cheaper if carried out by a local tradesman or as a "self-help" exercise by the local ringers/congregation.

3) Any required works to the clock, including the clock hammers.

TERMS OF PAYMENT

1) 33% when the fittings have been dismantled and transported to our Works.

3) The balance, less any deductions due, when works are complete in the Tower.

PLEASE NOTE THAT WE DO NOT ASK FOR ANY PAYMENT WITH ORDER.

POSSIBLE DEDUCTIONS

1) **Fit & able-bodied** local labour to assist us with the dismantling & lowering of the fittings (minimum 3 persons) so that we only need send one Bellhanger. **£288.00**

2) **Fit & able-bodied** local labour to assist with the hoisting and installation of the fittings (minimum 3 persons) so that we only need send one Bellhanger. **£672.00**

3) Lodgings and all meals to be supplied for our Bellhanger(s) whilst on site **£41.00 per day per man**

HEALTH AND SAFETY

The deductions given in (1) and (2) assume that we will only send one Bellhanger. If the number of helpers is below the number requested we reserve the right to send an extra Bellhanger and adjust the deduction accordingly. For health and safety reasons someone **MUST** be present in the tower at all times when our Bellhanger is present. If this at any time is not the case he will leave the site and the deductions will be adjusted accordingly.

PLEASE NOTE THAT OUR INSURANCE'S DO NOT COVER ANY LOCAL PERSONS ASSISTING WITH THIS PROJECT OR WORKING IN THE TOWER ON THEIR OWN. ***THEIR INSURANCE COVER SHOULD BE ARRANGED BY OTHERS.***

TO COMPLY WITH HEALTH & SAFETY LEGISLATION WE WILL SUPPLY HARD HATS FOR ANY VOLUNTARY LABOURERS. HOWEVER, THEY WILL BE REQUIRED TO SUPPLY THEIR OWN SENSIBLE PROTECTIVE CLOTHING AND FOOTWEAR. SOFT FOOTWEAR SUCH AS TRAINERS IS NOT ACCEPTABLE.

THE DIRECTORS AND STAFF OF WHITES OF APPLETON LTD ACCEPT NO RESPONSIBILITY WHATSOEVER FOR ANY ON SITE WORKS UNDERTAKEN WHEN THEY ARE NOT IN ATTENDANCE.

A FACULTY MUST BE OBTAINED BEFORE ANY WORKS COMMENCE.

PENHURST, KENT

CHURCH OF ST JOHN THE BAPTIST

Report upon the condition of the bell installation
following an inspection undertaken on Thursday 21st November 2013,
together with quotations for undertaking the recommended works

CONTENTS:

1. The Bells ..... Page 2
2. The Fittings ..... Page 5
3. The Frame ..... Page 7
4. The Tower ..... Page 8
5. Conclusions ..... Page 9
6. Recommendations ..... Page 10

Quotations

2. Re-rope all eight bells.
3. Turn and tune the bells, re-hang them with mainly new fittings, rearrange the roping, thoroughly clean out the belfry, paint the bellframe and improve access from the spiral staircase to the top of the bellframe.

Terms and Conditions

on behalf of Whitechapel Bell Foundry Limited

Date: 2nd January 2014

PENSHURST, KENT – CHURCH OF ST JOHN THE BAPTIST

The Bells

The church possesses a ring of eight bells in the very approximate key of E ^{b} as follows:

Bell	Diameter	Strike Note	Approx. Weight	Date	Founder
Tenor	3'-10¾"	8313½ c.p.s.	17-2-11	1619	Joseph Hatch, Ulcombe
7th	3'-8"	356½ (3¾#)	14-0-6	1896	Mears & Stainbank, London
6th	3'-4"	397¼ (5½#)	10-3-7		
5th	3'-0¾"	419 (1#)	7-2-26	c1370	Stephen Norton, London
4th	2'-9½"	484 (13¾#)	6-3-0	1802	Thomas Mears, London
3rd	2'-8½"	539¾ (17½#)	6-2-0	1701	Richard Phelps, London
2nd	2'-7"	591 (3¼#)	6-0-3	1896	Mears & Stainbank
Treble	2'-6"	638 (11#)	5-3-19		

*E^{b} International Pitch – 311.1 cp.s.

The 5th bell has been identified by the Council for the Care of Churches as being of historic significance.

All the bells appeared sound but are only fair for tone and tune. As can be seen from the table above, the seven smaller bells are all sharp with respect to the tenor but by varying degrees. Of significance is the fact that the treble, 3rd and 4th bells are particularly sharp. It should also be remembered that all the bells were made before their founders fully understood the harmonic structure of bells and in consequence of this their various harmonic tones are somewhat randomly arranged. A full tonal analysis is given at the end of this section from which it will be observed that the 2nd partial is sharp in the tenor, and a lesser extent the 5th, but flat in the remaining six bells with this comment particularly applying to the treble and 2nd. It will also be noted that the hum notes are all sharp but by varying degrees and again with this comment particularly applying to the tenor, 7th, 6th, 4th, 3rd and treble. It is the misalignment of these octave harmonics that is chiefly responsible for the varying tonal qualities bell to bell.

PENSHURST, KENT – CHURCH OF ST JOHN THE BAPTIST

It should also be mentioned that both for the keynote and also for the sizes of the neighbouring bells the tenor is under-sized whilst the three smallest bells are somewhat over-sized. It will be noted for instance that the treble is less than a hundredweight lighter than the 4th.

All the bells were made with canons, or supporting loops, with those upon the 7th and 6th being to the squat "Doncaster" pattern. These canons have however been removed from the tenor, 5th and 3rd. They are fully intact upon the remaining five.

With the exception of the 7th and 6th, all bells were made with cast in crown staples however these have been cut away and centre holes drilled for independent staples. The roots of these staples are however in place in the tenor, 5th, 4th, 3rd, 2nd and treble. These staples, being of iron, are often the cause of old bells becoming cracked due to their rust and consequent expansion. In the event of our undertaking any work to the bells we would remove the remains of these staples thus reducing the risk of the bells becoming cracked in the future.

The tenor and 5th bells have been turned through 90° and again through 45°. The 4th and 3rd bells have been turned through 90° whilst the four newer bells are unturned. All bells are again becoming indented with the indentation upon the 7th and 6th reaching the point when turning is now advisable.

PENSHURST, KENT – CHURCH OF ST JOHN THE BAPTIST

DETAILS OF THE PRINCIPLE HARMONIC TONES OF THE EIGHT BELLS

Bell	Hum Note	2nd Partial	3rd	5th	Nominal
Tenor	171.5	333	389.5	509	627
7th	195.5	349.5	431	558.5	713
6th	221	395.5	483.5	635	794.5
5th	218.5	425.5	513.5	647.5	838
4th	271.5	460.5	591	764	968
3rd	298	518	666	836	1079.5
2nd	312	543	706.5	902.5	1182
Treble	352.5	580	771	101.1	1276

*E^b International Pitch = 311.1 c.p.s.
E^b Old Concert Pitch = 321 c.p.s.

Note:

1. Strike note = nominal ÷ 2
2. 2nd partial should be nominal ÷ 2
3. Hum note should be nominal ÷ 4

PENSHURST, KENT – CHURCH OF ST JOHN THE BAPTIST

The Ringing Fittings

The bells are equipped with fittings for full circle change ringing which date mainly from 1896 when Thomas Blackbourne of Salisbury hung the bells with new fittings and framework and partly from 1973 when the frictional parts were renewed by this company. Generally the equipment is in a fair condition although we are conscious that the sizes of the headstocks and the leading dimensions associated with the ringing fittings are such that by modern standards the bells would be regarded as slow turning and "lumbering".

The bells hang from Elm headstocks with cast iron and steel gudgeons bolted to their ends. The gudgeons were renewed in 1973 as were also the main bearings. Double row self-aligning ball bearings in standard cast iron plumber block housings were employed on the six smaller bells whereas, through lack of space, singe row aligning ball bearings in narrow cast iron plumber block housings were employed for the tenor and 7th. Externally these bearings appeared sound and the bolts associated with the gudgeon fixings all appeared tight.

Where canons have been removed the crowns of the bells have been drilled for through bolts which secure the bells to their headstocks. Where the canons are in place conventional forged ironwork is used to secure the bells and this loops around the canons passing up either side of the headstocks to flat steel bars above. As with the gudgeon fixings the various fastenings appeared nominally tight.

The clappers are of wrought iron and are of fair shape and proportion although flatting is now taking place on the ball surfaces and the clapper ball on the 7th is now starting to flake away around the areas of contact. All clappers incorporate the modern "eye" top end with a non metallic bush running upon staple hinge pins spanning the jaws of forked independent staples which bolt up through the centres of the crowns and headstocks above. Some wear is taking place at the points of swing however this is not serious. All clappers swung in line however a number now squeak and require lubrication.

The wheels appeared sound and are firmly held in place. They are however somewhat heavily constructed which will cause the bells to turn a little more slowly than one would expect for their weights.

The bellropes are in fair condition. Those on the 5th and treble are drawn under the wheel slightly with double pulleys to improve the spacing of the bellropes in the chambers beneath whereas the remaining six ropes drop plumb. The pulleys are of moulded nylon and were provided in 1973. Although all rotate freely most are now worn. The pulley upon the tenor is fitted down to one of the floorboards however this is loose and can be moved about. At the time of our visit the pulley was not nicely aligned with the wheel.

In fitting new pulleys in 1973 we simply positioned them at the same heights as the previous pulleys however by modern standards these are not optimum. In most cases the pulley boxes are set rather low.

PENSHURST, KENT – CHURCH OF ST JOHN THE BAPTIST

Conventional stays, sliders and runnerboards are in place and these are in a serviceable condition although most of the sliders now pass rather stiffly.

Gravity type clock hammers are in place to strike the quarters and hours upon the 2nd, 3rd, 4th, 7th and tenor with there being two hammers upon the 7th to facilitate rapid repeat.

All timberwork in the fittings appeared sound and all iron and steelwork is reasonably painted although rust is now starting to appear.

PENSHURST, KENT – CHURCH OF ST JOHN THE BAPTIST

The Bellframe

The bellframe is a composite structure comprising massive cast iron framesides secured to a timber foundation which takes its bearing upon the belfry floor which in turn is supported by three heavy Oak beams spanning the tower east/west. The bellframe, its foundation and the belfry floor were installed by Thomas Blackbourne in 1896. The frame is arranged to accommodate the eight bells upon one level with the tenor, 7th, 4th and 3rd swinging east/west (the strong way of the tower) whilst the 6th, 5th, 2nd and treble swing north/south. The whole structure has been well designed and constructed and we reported in 1984 that only the slightest of movement took place when the tenor bell was rung.

As with the ringing fittings all timberwork appeared sound and all iron and steelwork reasonably painted.

PENSHURST, KENT – CHURCH OF ST JOHN THE BAPTIST

The Tower

The tower is of masonry construction and stands conventionally at the west end of the church. Diagonal buttresses are incorporated in to the four corners in order to provide rigidity although very slight movement in the tower structure was reported when we undertook a tower movement measurement test on 22nd September 1960. The movement was however only in the order of 1/32"and therefore unlikely to have any significant effect upon the ease with which the bells could be controlled.

Access to the ground floor ringing area is either via a large arch in the east wall which leads directly from the nave or alternatively through double doors on the west side from the churchyard outside. A spiral staircase in the south-west corner gives access to the first floor clock chamber and second floor belfry.

The first floor is a little over 30'-0" above the ground thus creating a ringing chamber considerably taller than optimum. To overcome the handling difficulties that this would create a rope guide has been installed to steady the ropes thus easing the handling of the bells.

The clock chamber is approximately 13'-0" high. It houses a turret clock manufactured by T. Cooke & Sons of York in 1858. This is sited adjacent to the south wall with the weights falling in the south-east corner to the ground floor.

The 5th bellropes falls plumb through this chamber however the remaining seven are all drawn from plumb to improve the spacing of the bellropes in the chamber beneath. The drawing of ropes is undertaken without the benefits of either flapboards or pulleys and in any case the rope holes through the floor and ceiling are rather small in diameter.

Additionally most of the ropes are drawn from plumb between the ringing room ceiling and the rope guide.

Access in to the belfry is cramped in that the door opens inwards with its movement being restricted by the bell framework immediately inside. To gain access to the top of the frame a timber board has been strapped to the south end of the treble pit and although useful the arrangement is barely satisfactory.

The bells hang level with sound openings on all four sides which have been partially boarded to reduce the crash of sound immediately around the church. In spite of this it is still considered that the bells are too loud particularly when practice ringing is being undertaken.

Generally the tower appeared to be in good condition and we could find no signs of distress in the usual areas.

PENSHURST, KENT – CHURCH OF ST JOHN THE BAPTIST

Conclusions

It is now a little under 120 years since the ring was augmented to eight and re-hung with new fittings and framework. It is clear that the bells have been regularly, rather than frequently, used during the intervening years and it is equally clear that the equipment has been maintained on a regular basis with the frictional parts having been renewed by this company a little over 40 years ago.

Generally the equipment is in fair condition however the ringing fittings and their leading dimensions are decidedly 19th century in style, the bellringers and the bells are too far apart for comfort with all of the bellropes being drawn between the belfry floor and the rope guide.

The bells themselves are mixed for age and quality and are not particularly well in tune.

The bellframe is massively constructed and although it relies upon a timber foundation is satisfactory and in good order.

PENSHURST, KENT – CHURCH OF ST JOHN THE BAPTIST

Recommendations

The main purpose of our visit was to consider the condition of the equipment bearing in mind that a ringers' gallery is now to be installed with the purpose of creating useful space at ground floor level whilst at the same time shortening the overall lengths of the bellropes which will be of significant benefit. We fully support the installation of such a gallery and indeed have been suggesting it for a number of years. We understand that access to this gallery will be via a built in doorway from the spiral staircase in the south-west corner which, to an extent, will determine the height at which the gallery is to be placed.

The installation of this gallery should allow for the complete removal of the rope guide and although the new ringing chamber will be slightly taller than optimum we think it unlikely that a guide will be required in this new and shorter chamber. Ideally the ringing chamber should have a clear height of approximately 16'-0" and anything that can be done in the design of this gallery to achieve this optimum height would be of benefit.

In re-arranging the ground floor area care should be taken to ensure that there is a passage left by which means the bells can be removed at any future date. The gallery floor should incorporate a centre hatchway at least 4'-0" square and immediately beneath there should be a passageway of similar width.

In conjunction with these building works it would also make sense to give consideration to sound levels around the church tower. It will be noted from the enclosed Code of Practice that sound control systems should be designed by the church's nominated architect and such designs need to take in to account the need for access to the louvers and the avoidance of changes in the outside appearance of the structure. Any permanent infilling of the sound openings should be relatively high in mass and all air gaps should be effectively sealed. As sound is directional the design can be varied on each face according to the required sound levels on those particular sides of the tower. We recommend a degree of adjustability in the sound control systems so that the bells may be brought as close to silence as possible for practice ringing whilst at the same time openable for service and celebration ringing. We shall be pleased to work closely with your chosen architect in establishing suitable designs.

As far as the bells are concerned we consider the minimum that can sensibly be undertaken is the work set out in out in our Quotation no. 2 of 18th October 2005 but modified slightly to take in to account the installation of a ringers' gallery. This work involved the improving of the roping down so that ropes would pass as near as possible plumb from the belfry and with the rope holes through the various floors and ceilings enlarged to optimum diameter. An updated and revised version of this quotation is enclosed herewith.

PENSHURST, KENT – CHURCH OF ST JOHN THE BAPTIST

Ideally the opportunity should be taken to re-hang the bells with mainly new fittings so that they perform in a manner that one would expect from a modern peal, turn the bells to present unworn sections to the clappers as indentation on some of the bells is now reaching a point when turning will soon be necessary, and tuning the bells to improve their pitch relationships and musical characteristics. As far as tuning is concerned we suggest that the ancient 5th bell be left as it is with the remaining seven bells being tuned to suit. This larger proposal would also include all of the work set out in the revised Quotation no. 2.

It is often the case that the Kent County Association of Change Ringers provide practical, as well as financial, help to Parishes restoring their church bells and mindful of this possibility we show appropriate allowances at the end of each quotation to take this possibility in to account.

QUOTATION

Ref. AH/SH

The Parochial Church Council
Church of St John the Baptist, Penshurst
For the attention of:
Mrs Janice Byrne
Brandon
Chafford Lane
Fordcombe
Kent TN3 0SH

11th February 2016

Quotation no. 2 (revised and update No.2)

PENSHURST, KENT – CHURCH OF ST JOHN THE BAPTIST

To: Re-rope all eight bells.

Survey

To send to the church to undertake a detailed survey of the roping of the bells.
Drop a plumb line through each rope hole to establish the draw of rope at each level. Establish how the ropes may be rearranged to maintain as closely as possible the existing circle at ground floor level and with the bellropes dropping as near plumb as possible.

PENSHURST, KENT – CHURCH OF ST JOHN THE BAPTIST
Quotation no. 2 (revised and updated) - continued

The Ringing Fittings

Provide double pulleys for drawing the ropes under the wheels and complete with all necessary fixing blocks and fastenings.
Provide stainless steel rope bosses for fitting to the floors and ceiling.

Painting (Materials at the Foundry only)

All iron and steelwork to be thoroughly cleaned and descaled.
Steelwork, including fastenings, to be hot dip galvanised.
Woodscrews to be of stainless steel.
Timber to be treated with Solignum.

Site Work

Provide a tower scaffold for access to the underside of the ringing chamber ceiling.
Deliver the fittings to the church.
Send two bellhangers to the church with all necessary tools and tackle.
Remove the pulleys and place to one side as customer's property.
Offer up and fit the double pulleys in the new positions.
Move the garter holes in the wheels to suit.
Drill down through the tower floors and ceiling as necessary and fit the new rope bosses.
Check the tightness of all fastenings in the fittings and tension where possible.
Smooth contact surfaces between sliders and runnerboards and liberally treat with beeswax.
Lubricate all clapper joints and ring up each bell adjusting for even clappering as far as the existing equipment will permit.
Refit the existing bellropes, shortening them at their top ends to suit the shorter draught and leave the eight bells all ready for use.

We undertake to carry out the whole of the work specified above, including the provision of lifting tackle, men's time, expenses, carriage and third party insurance in connection therewith, for the sum of:

£8,358.00 plus VAT

Allowance

1. If fit able-bodied assistance were provided so that it was only necessary to send one bellhanger there would be an allowance of **£2,006.00**

QUOTATION

Ref. AH/SH

The Parochial Church Council
Church of St John the Baptist, Penshurst
For the attention of:
Mrs Janice Byrne
Brandon
Chafford Lane
Fordcombe
Kent TN3 0SH

11th March 2016

Quotation no. 3 (updated)

PENSHURST, KENT – CHURCH OF ST JOHN THE BAPTIST

To: Turn and tune the bells, re-hang them with mainly new fittings, rearrange the roping, thoroughly clean out the belfry, paint the bellframe and improve access from the spiral staircase to the top of the bellframe.

Dismantling

To send two men to the church with all necessary tools and tackle.
To dismantle the eight bells and fittings and lower these items to the ground.
Neatly coil the bellropes and place to one side as customer's property.
Send the bells, clappers, staples and bearing housings to the foundry for re-use and stack the unwanted fittings in the churchyard for disposal by others.
(Alternatively, remove the fittings from site as scrap if so directed).
Take all necessary measurements from the bellframe for new fittings and new bearing plates for the tenor and 7th.

PENSHURST, KENT – CHURCH OF ST JOHN THE BAPTIST
Quotation no. 3 - continued

The Bells

Increase the sizes of the centre holes through the crowns of the bells as necessary.
Remove as much of the remaining staple iron from the crowns of the bells as possible.
Neatly grind away the remaining canons to facilitate the fittings of standard cast iron headstocks.
Place the 5th bell upon a tuning machine, face the inside of the crown of the bell to provide a flat staple seating, voice the bell to establish the optimum striking position and accurately pitch the bell to create the tuning standard for the remaining seven.
Undertake no tuning to bell no. 5.
Carefully adjust the notes and principle partial tones of the remaining seven bells under a tuning machine to suit the uncut 5th. Face the insides of the crowns of these seven bells to provide flat staple seatings and voice each bell to establish the optimum striking positions.
Cast resin pads onto the crowns of the bells to present a flat surface to the new headstocks.
Turn the bells to present unworn sections to the clappers.
Drill the crowns for supporting bolts (existing bell bolt holes to be employed wherever possible).

The Ringing Fittings

For each bell provide the following new fittings:

Headstock of cast iron with steel gudgeons turned in true alignment, and with staple bolt adjusting screws for setting and maintaining even clappering.
Self-aligning, double row ball bearings, in cast iron plummer block housings (tenor and 7th only).
Heavy steel bedplates for fitting to the top members of the bell frame to support the bearing housings (tenor and 7th only).
Self-aligning double row ball bearings complete with new grease seals (six smaller bells only).
Insulation pad for fitting between the bell and headstock, together with supporting bolts, with nuts, lock nuts and insulation washers.
Wheel of Oak fitted with steel angle braces.
Pulley of cast nylon, running on two lubricated for life sealed ball bearings, and housed in a hardwood box.
Stay and slider of Ash with hardwood runner board.
Slider pin of steel.
Rope bosses of stainless steel.
Bellrope of best quality flax with a close woven red, white and blue wool sally and with a pre-stretched polyester top end.

Thoroughly clean out the bearing housings and bearing sleeves from the six smaller bells for re-use.
Modify the existing clappers and staples to suit the new hanging arrangements and fit new resiliently mounted Tufnol bearings to the points of swing.

PENSHURST, KENT – CHURCH OF ST JOHN THE BAPTIST
Quotation no. 3 - continued

Painting (Materials at the Foundry only)

All iron and steelwork to be thoroughly cleaned and descaled.
Steelwork, including fastenings, to be hot dip galvanised.
Woodscrews to be of stainless steel.
Iron castings to be primed one coat Galvafroid rust inhibitor and finished with one undercoat and one gloss coat Permaglaze charcoal grey.
Timber to be treated with Solignum.

Re-hanging

Deliver the new bearing plates to the church together with all necessary materials for cleaning and painting the bellframe and cleaning out the belfry area.
Set the new bearing plates on to the bellframe true and level.
Check the levels across the remaining six pairs of plates and measure up and make up any levelling shims that may be necessary.
Check the tightness of all fastenings in the bellframe.
Thoroughly clean out the belfry area with particular reference to the gap between the base of the bellframe and the tower walls.
Scrape and wire brush the bellframe and paint two coats Hammerite black strictly in accordance with manufacturer's instructions.
Make up and properly fix two hardwood bearers to the outer end of the treble pit to improve access from the spiral staircase to the top of the bellframe.
Deliver the bells and fittings to the church and hoist in to the tower.
Set the bearings on the framework true and level. Hoist and hang the bells therein and assemble the fittings.
Plumb down through from the wheels to the new ringing chamber, fitting double pulleys where appropriate to produce the best possible rope circle. Drill down through the belfry floor and ringing chamber ceiling and fit the rope bosses at each level.
Provide and assemble the tower scaffold on to the new ringing gallery to permit the fitting of rope bosses to the underside of the ceiling.
Adjust each bell for even clappering and correct set; handstroke and backstroke.
Fit the new bellropes and leave the eight bells all ready for use.
Arrange for a test ringing of the bells with the local bellringers and make any final adjustments.

We undertake to carry out the whole of the work specified above, including the provision of lifting tackle, men's time, expenses, carriage and third party insurance in connection therewith, for the sum of:

£53,640.00 plus VAT

PENSHURST, KENT – CHURCH OF ST JOHN THE BAPTIST
Quotation no. 3 - continued

Allowances

1. If fit, able-bodied assistance (two persons between the ages of 21 and 70) were provided for the dismantling work there would be an allowance of **£1,160.00**.

2. Alternatively, if all dismantling works were to be undertaken by others and the bells and some fittings were delivered free to our works there would be an allowance of **£3,165.00.**

3. If fit, able-bodied assistance (two persons between the ages of 21 and 70) were provided for the re-hanging works so that it was only necessary to send one bellhanger there would be an allowance of **£4,010.00.**

Note: Fit able-bodied assistants are responsible for suitable clothing and insurance whilst undertaking the work. In the event of the personnel being absent or unsuitable (in the judgement of Whitechapel Bell Foundry Limited) for the tasks to be undertaken we reserve the right to provide additional company personnel and charge accordingly.

The Bells of St John the Baptist, Penshurst

Application for a Faculty to re-hang and re-rope the Bells - Quotation no. 3 Whitechapel Bell foundry

St John the Baptist Church Penshurst has a ring of 8 bells. These bells are rung regularly for Sunday Services and other special occasions. Penshurst is a popular venue for weddings and the bells were requested for 24 weddings last year alone. They are used for District Ringing Meetings and also by other visiting ringers. There have been several Quarter Peals in recent years and this year there is a Peal attempt planned in November.

Statement of Need

The bells have been regularly maintained by our steeple keeper but they have had no major work done on them since the 1970s when just the frictional parts were renewed. Three bell hanging companies have been called in to inspect our bells (Whitechapel, Whites of Appleton and Nicholson Engineering) and it clear that some work needs to be done them in order that they remain ringable in future years. Some of the bells are wearing thin where the clappers are hitting the same part of the bell and so they need to be 'turned'. This needs to be done soon as several of the bells have reached the critical point at which they might crack. The bells are hung on old style headstocks and so they will need to be rehung in order for them to be turned. The wheels need replacing as they are very old and some have woodworm; however the metal frame is sound. The ropes need to be repositioned and new pulleys will need to be installed. At present the ropes are sawing through the clock chamber floor boards as they are significantly drawn and they need to be realigned. There are also general maintenance issues. The three quotes are very detailed and make similar recommendations costing approximately £50,000. All three quotes are available to be seen on request.

There is also a plan to put in a ringing floor which will be funded by a benefactor so that the bells can be rung from a first floor platform. This together with the rehanging and re-roping will make the bells considerably easier to ring. If the installation of a ringing floor goes ahead it would make sense to do the work on the bells first as the bells would need to be removed from the tower in order to rehang and turn them. If the floor is not installed the work on the bells would still need to be done for the reasons mentioned above.

Statement of Significance

The bells were cast at different times by different foundries. The 5th bell has been identified by the Council for the Care of Churches as being of historic significance. It is listed in the 'Schedule of Bells for Preservation.

Penshurst Bells - St John the Baptist

Bell	Weight	Note	Diameter	Cast	Founder
1 Treble	5-3-19	Eb	30.00"	1896	Mears & Stainbank
2	6-0-3	D	31.00"	1896	Mears & Stainbank
3	7cwt	C	33.50"	1701	Richard Phelps
4	6¾cwt	Bb	35.00"	1802	Thomas I Mears
5	7½cwt	Ab	36.00"	c1370†	Stephen Norton
6	10-3-7	G	40.13"	1896	Mears & Stainbank
7	14-0-6	F	44.00"	1896	Mears & Stainbank
8 Tenor	17-2-11	Eb	47.50"	1619	Joseph Hatch

Whitechapel recommend that if the bells are tuned when they are being rehung that the bells are tuned to the 5th. In this way the 5th is not altered in any way.

Penshurst is a picturesque village in West Kent with a population of about 1,000. The Church, which dates from the 12th century, is situated in the centre of the village close to Penshust Place. Penshurst bells are well known in the Kent District as being very difficult to handle. They are a ground floor ring. They sound beautiful when well rung, but due to the very long draft – coupled with the fact that the ropes are not at all well aligned - they are very difficult to handle. It is extremely rare to be able to teach anyone to ring at Penshurst, and many experienced ringers will not ring there. Despite this, we – the local ringers - have worked very hard and now have an enthusiastic band of ringers, the size of which has expanded in recent years. We now regularly ring all 8 bells on Sundays.

It has long been suggested by local experts and by the bell hangers at Whitechapel that our bells would be much easier to ring if they were rung from a first floor ringing chamber. Pegs in the wall and door shaped stone work inside the spiral stair case indicate this was once the case.

We have found a donor who is very prepared to donate money to put in a ringing floor and we have called in three bell hanging companies to examine the bells and give us their opinion on the project as a whole. As we expected there is a considerable amount of work that needs to be done on the bells -preferably before the ringing floor goes in. Some of the bells are wearing thin where the clappers are hitting the same part of the bell and so they need to be turned. This needs to be done as soon as possible as several of the bells have reached the critical point at which they might crack. The bells are hung on old style headstocks and so they will need to be rehung. The wheels need replacing as they are very old - probably 100 years old; however the metal frame is sound. The ropes will need to be repositioned and new pulleys will need to be installed. At present the ropes are sawing through the clock chamber floor boards as they are significantly drawn and they will need to be realigned before the new ringing floor goes in. There are also general maintenance issues. The three quotes are very detailed and make similar recommendations costing approximately £50,000. The quotes are available to be seen when requested.

Last year considerable work was done on Penshurst church. Kitchen facilities were installed at the back of the church and a small extension was put on to provide toilet facilities. The heating and lighting had a much needed upgrade and considerable repair work was done to the inside of the church. The project involved an enormous amount of local fund raising. The church now looks marvellous but there is no money left to restore the bells.

If Penshurst bells are rehung and a ringing chamber installed it will make the bells so much easier to ring. We are a very active team of ringers and have the time and enthusiasm to teach others to ring. We do run a beginners practise at a nearby tower every week which we would like to run at Penshurst but the bells are too difficult for learners at present. We have no young ringers as the bells are not suitable for young people to ring and same applies to older ringers. With a first floor ringing chamber, rehanging and re-roping, the bells would be more easily rung by young and old alike.

Apart from the Sunday services Penshurst Church is a very popular wedding venue and almost all the weddings request the bells. There were 25 weddings with bells last year and this year there are 20 so far that we are aware of. The bells are rung very regularly for Sunday service and we have a weekly Thursday night practise. We want to be able to include more people- young, old, inexperienced, and the more nervous ringers. The ringing floor will enable us to do this but the bells also need to be restored otherwise they will become effectively unringable.

The plans for the ringing floor are progressing fast. The architect Eva Jiricna is designing the new ringing floor http://www.ejal.com/ . We are anticipating not only an increase in ringers in our tower but also an increase in visiting ringers as the ringing floor is planned to be an amazing installation.

Our bells are of significant historical interest. The 5th is circa 1370 and is listed in the Church buildings Council 'Schedule of Bell preservation' in the Rochester Diocese.

Whilst the ringing floor is being funded, as stated above, by a donor and The Kent County Association of Change Ringers have offered a grant of £10,000 we still need a further £40,000 to complete the bell restoration work.

Tower contact: Janice Byrne tel: 01892 740393 email: janice.a.byrne@btinternet.com

HLF EVALUATION REPORT

Project Title: Penshurst: conserving, interpreting and archiving a church and its village.
Project No.: OH-13-02907

Overview

1. This project formed part of other works the overall purpose of which was to preserve the 900 year old church of St John the Baptist, Penshurst for present and future generations and to re-order it to make it fit for a wider range of religious and secular purposes. This re-ordering was not part of the HLF Project but was an important part of the overall plan to ensure the continued preservation and use of the church.

2. The HLF Project covered three main areas:
   - i Repair and conservation work;
   - ii Interpretation of the history and architecture of the church; and
   - iii Housing and development of a local historical archive.

3. Parts of the non-HLF supported works have not yet been completed. The re-ordering was intended to include the removal of the chancel screen and re-ordering of the chancel. This work has been delayed due to opposition from the Victorian Society to the removal of the screen. However, apart from very minor matters (such as lighting in the chancel) this has not affected the HLF supported work which is now virtually complete. Indeed, having obtained additional funding, we have been able to complete the restoration of the font which, although part of the urgent conservation works required, had originally had to be excluded from the planned works due to its expense. There have been minor changes made to the works carried out but, in general, the works originally intended have been carried out and completed approximately in line with the original budget costs.

HLF Approved Purposes

4. The approved purposes of the HLF Project were:

i Repair and conservation: Undertake repair and conservation work defined as requiring prompt attention in the 2011 Quinquennial.

ii Interpretation:

- a Add lighting to display heritage features.
- b Create a welcome desk with interpretation, create website content and install wifi.
- c Train a target of 10 volunteer guides/stewards.
- d Arrange a target of 10 school visits pa with volunteer guides.
- e Liaise with Penshurst Place on joint tours and visitor information.

iii Archive:

- a Convert a room in the church for storage display and handling of archival material.
- b Train volunteers in further archival acquisition, cataloguing and display.
- c Create and provide the first annual exhibition based on the First World War memorial.

REPAIR AND CONSERVATION

Work done

5. The planned repair and conservation work has been completed successfully and within budget. The work completed included the major items of the work that the 2011 Quinquennial Survey indicated required either prompt attention or attention within 2 or 5 years. The main work carried out was:

i Leaks in join between nave and south aisle roof successfully repaired.

ii Ingress of damp from northern side to walls successfully stemmed.

iii Complete redecoration of church, including repair of blasted plasterwork, wholly successful and much admired.

iv Mediaeval font repaired and repainted.

v Work uncovered hidden painting of east wall, probably 18th century – conservator's report received and decisions required on how to reveal and/or preserve.

6. The font repair was an item that the Quinquennial advised required prompt attention to "Remove painting to font using a conservator". The font had been "horribly over-painted in oil based paint" causing "severe damage to the stonework". Due to the cost of the conservation work required, this item had been excluded from the initial works contracted for. However, subsequent separate donations and a saving on certain other items of the HLF funded work has enabled the font to be restored.

Approved purpose achieved

7. The approved purpose of carrying out the work defined as requiring prompt attention in the 2011 Quinquennial has been achieved.

Records

8. The course of the restoration is shown by pictorial archives.

   i The church prior to restoration. http://www.blythehill.com/penshurst_church_pre_restoration/content/index.html

   ii The church during restoration. http://www.blythehill.com/penshurst_church_during_restoration/content/index.html

   iii The font restoration (picture of restored font attached).

INTERPRETATION

9. Following a tender process, Motivation 81 Ltd was engaged to project manage the new approach to interpretation of the church and its communication with the outside world. Motivation's approach put particular emphasis on the church establishing not just physical guiding material in the building itself , but a professional website through which it could continue to communicate messages about its history and current day events to villagers, schoolchildren, visitors and tourists alike.

Work done

10. Progress to date:

i Welcome desk constructed and installed.

ii Wifi installed.

iii Branding and logo for the church and all its activities designed and implemented.

iv Six interpretation boards have been mounted at various parts of the church (example of artwork for one of the interpretation boards attached). These deal with its artistic, architectural, military and political contents and are much admired for their design and content and have proved practical. The interpretation boards include Q codes that enable tablet/smartphone users to access the long and short form guides as well as specific material on the various features of the church not otherwise available on the guides.

v Website http://www.penshurstchurch.org designed, live and maintained by the church's new part-time administrator.

vi New, free short-form guide (A5) designed, printed and available at church entry point. Some 500 copies have been used in the first full year, but we feel this is a disappointing proportion of total visitors to the church. We have therefore asked Motivation to redesign the display of material at the entry point to draw more attention to it and make it clear that this guide is free.

vii The guide is also available on-line, on tablets or on smartphones (go to download guide on website http://www.penshurstchurch.org). It is possible that the proportion of visitors using the guides is higher than is suggested by the take up of physical guides because they are using the on-line facility.

viii A fuller 32 page, coloured guide is available for purchase at £3 and take-up is steady: we estimate that 250 copies were bought in the first full year. Again, the content is available on-line in the church without charge (copy attached). All interpretation material on the website and in hard copy was written and illustrated by volunteers within the village.

ix New lighting scheme installed. This has assisted in bringing out more features of the church's history, particularly in its roof. It is a pity that we were not able to secure permission from the Sidney family to light the fine roof of the Sidney family chapel.

Approved purposes achieved

11. Achievement towards the agreed approved purposes is as follows:

i Lighting to display heritage features has been completed.

ii An interpretation welcome desk has been built and installed, website content has been created and wifi installed.

iii Six people (towards target of 10) have been trained to give guided tours of the church, for which written guidance notes are available in support. Guided tours are available by arrangement and are also provided without prior arrangement in connection with other events in the church including an annual Heritage Open Day that takes place in September each year.

iv Further work is required to achieve the target of 10 school visits pa. We consulted with the local primary school on content and format of the educational material required and drew up preliminary drafts of content and four worksheets for children in year 5 and 6. However we feel this needs further work before it can be placed on the website for teachers to access and it is currently in the hands of Motivation for improvement of its design.

v Liaison with Penshurst Place on joint tours and visitor information has taken place and is ongoing. The online guides referred to above include the support we are providing to Penshurst Place which has undertaken to provide similar support to the church.

vi We have held one open event based on the interpretation material. This was an evening on the life of Sir William Coventry (whose memorial is in the church) illustrated by an actor reading from Samuel Pepys's diaries (in which Sir William frequently appears). Attendance was over 100

vii Our evaluation has shown us that we need to attract a higher proportion of visitors to the available interpretation material at the entry point (especially the free guide sheets). We have instructed Motivation to review the lay-out at this point and provide clearer guidance; we also plan to review the lighting arrangements, so that spotlights on the welcome desk and its material will be activated when visitors first enter the building.

ARCHIVE

12. The original intention was to convert a basement space to house the archive. This proved impractical and an amendment to the plans was approved by the HLF to substitute ground floor level storage for the archive. Training of the initial group of volunteers has taken place and the substantial task of cataloguing the archive is in progress. It was decided that the best way to handle the current and future archive content was to put all the material on line to create what is now know as the Penshurst Living Archive. A strategy to achieve this was developed with expert help. Software for recording, cataloguing and displaying archival material in digital form has been identified. A website has also been designed and implemented for the free, on-line display of material to all those interested, whether villagers or wider-spread researchers.

Work done

13. The archive works completed include:

    i Construction and installation of archive display and storage cabinets.

    ii Archive catalogue set up.

    iii Training of 7 archive volunteers including one web master and 6 web editors.

    iv Physical archive transferred to new storage in the church.

    v Process of putting archive material online has commenced and is continuing.

Approved purposes achieved

14. Progress towards the approved purposes is as follows:

    i The revised arrangements for the storage and display of archival material on the ground floor of the church have been completed as has the physical transfer of the existing archive material to the new storage facilities.

    ii The identification of the appropriate archive software and website provider was achieved with the expert assistance the Kent Community Historian and of a volunteer who is in charge of the historic archives at the National Maritime Museum. Both have provided their assistance free of charge. The web site is

still being populated and it not ready to go live but it is hoped to launch the site for public access in September 2016.

iii The software supplier, Community Sites, has delivered two training days, in October 2015 and January 2016, to the seven initial volunteers who will act as editors for specific content of the archive. These volunteers have held two further sessions between themselves in March and April 2016. Monthly meetings are scheduled until the site launches. Currently the editors are selecting and loading a representative cross-section of material from the main archival collection, the John Flower collection, as the launch content. These documents come under the broad headings of People, Places, History and Activities. It is clear that there is ample material of real interest and all involved are confident that they can secure more contemporary material of genuine interest to current and future archive users. The main constraint is turning out to be the time required for each document to be recorded, stored, catalogued and displayed: the process is not as seamless as it would be in an ideal world and several tasks have to be repeated if the work is to be carried out according to community archive guidelines.

iv The first exhibition based on the archive material was presented in the autumn of 2014 to coincide with the centenary of the outbreak of the First World War. The exhibition was based around the names on the war memorial in the church. The exhibition was great success and a record of it remains available at http://www.penshurstreflects.com

ACTIVITIES

15. Since the church was re-opened in April 2015 there have been the following (non-ecclesiastical) events:

i 4 organ recitals

ii 3 fund-raising and awareness fairs in the village

iii 2 choral concerts

iv 1 orchestral concert

v 1 major exhibition commemorating the role of Penshurst and its fallen in the

first world war

vi 1 literary lunch (part of Tunbridge Wells festival)

vii 1 exhibition opening event

viii 1 historical evening

ix 1 event for visiting bell-ringers

x 1 tour for a church architecture group

xi 1 Heritage Open Day (another planned for September 2016)

16. We had hoped to record the number of visitors to the church following the completion of the works but it has not proved practical to do so. The church is open all day, every day and we cannot afford staff on hand to greet and record numbers (or gender, ethnicity, social class or disability). Our evaluation is that visitor numbers are broadly unchanged so far (we were unable to afford the external signposting part of original plans because of budget limitations and the higher importance given to an on-line presence) but that the average stay per visitor is longer than it used to be, thanks to improved interpretation material.

Outreach

17. Outreach is achieved through the following methods:

i A regular stall at the Penshurst Farmers Market, held monthly at Penshurst Place estate – this attracts substantial footfall.

ii Bi-annual Fairs held in Penshurst Village hall at Easter and August bank holidays

iii Regular articles in the Penshurst news, a village publication with a circulation of approx. 400 copies.

iv A new electronic newsletter on church-related news that goes four times a year to approx. 500 email addresses

v Church guides are available in the village Post office and at the Penshurst Place estate gift shop.

VOLUNTEERS

18. All these events have been conceived, organized and run by volunteers, with the part-time help of one paid assistant.

19. Approximately 15-20 volunteers are regularly involved in aspects of these events.

20. Each gives an average of at least 30 hours' time over the year.

TRAINING

21. 2 days of structured training in archive recording and cataloguing have been provided to 6 volunteers.

22. 1 day of structured training has been provided to 3 volunteers in the management and maintenance of the church website.

23. Just before the project, a half-day of structured training in guiding around the church was provided to six volunteer guides.

NEW STAFF

24. Since the start of the project we have taken on the part-time paid services of one events organizer to cope with the increased activity. She is still in post.

ACKNOWLEDGEMENT of HLF

25. HLF's role in funding this project is or has been acknowledged in the following ways:
    - i On the church website
    - ii On all printed guiding material – free and paid-for
    - iii At the church entrance
    - iv At launch events
    - v In Penshurst News magazine

DIGITAL OUTPUTS

26. We confirm that all digital outputs comply with HLF Appendix 4. We are willing to contribute digital outputs to appropriate heritage collections.

Prepared by:

Simon Crookenden
On behalf of the PCC and the Friends of Penshurst Church
Dated: 10 May 2016