

Derby Diocesan Association of Church Bellringers Consultant's Report	Report no 05/003
Inspection of Bell Installation at St Paul's Church, Quarndon	Issue date 09/04/03

1.0 Introduction

The inspection was carried out on 31st. March at the request of Mr. Tony Glover, a member of the PCC. The church, built in 1874, has a single bell that is rung full circle from the ground floor. The bell was cast on January 20th. 1874 and installed in the same year. In 1973 the bell was rehung on ball bearings with new fittings.

2.0 General

The single bell is housed in a tower at the West End of the church. The tower is of brick construction, which is faced with stone on the outside. The ringing is carried out from the ground floor and a single hole is present in the ceiling for the ringing of the bell full circle by a bell rope connected to the wheel as is standard. Access to the clock mechanism and the bell chamber is by a fixed vertical wooden ladder. From this level a free-standing wooden ladder is available for positioning against the north louvre sill to reach the actual wooden bell frame. The ends of the north/south foundation beams all rest on corbels. One clock face is located on the west end of the tower and the drive mechanism for the hands actually passes through a hole drilled in one of the foundation beams.

3.0 Ground Floor Layout (see Figure 1)

The area is almost square in section and is used as a storage area for chairs and books. These do not interfere with the ringing of the bell by the rope, which is located in the South West corner. The area is open to the main body of the church by arches on the East and North sides. The redundant clock weight box is still affixed to the West wall. The mechanism for withdrawing the clock hammer from striking the bell whilst being rung full circle is adjacent to this casing. Access to the clock room floor is gained by climbing the vertical wooden ladder which is fitted to the South wall. The ladder, although not captive at floor level, is fixed by metal bracing straps to the wall part way up and is firmly clamped at the trapdoor level. The trapdoor, of good construction, is hinged and when open rests against a wooden support.

4.0 Clock Room Floor (see figure 2)

Clear of any rubbish the area is well served by natural light coming through the windows on the South and West walls. More natural light from the louvres higher up make the use of any artificial light unnecessary during the daytime, although a single incandescent light bulb is fitted on the East wall. The clock case is fitted to the West wall and at some time an electric autowind system has been fitted making the weight box that is affixed to the west wall on the ground floor redundant. The floor is of wooden construction and when the trapdoor is shut the noise level at the bell ringer's ear would be acceptable. The bell rope's natural fall brings it very close to the side of the case but this in no way impairs the ringing of the bell. The only other piece of equipment in this area is an old, but serviceable, unfixed wooden ladder that can be positioned to gain access to the top of the clockcase or to one of the sills of a louvre.

5.0 Foundation Beams (see figure 3)

These timbers run east/west and rest on timbers running north/south, all four corners rest on stone corbels. There was no sign of any woodworm or rot. Wooden wedges have been driven in at the ends of the beams to 'lock' them in place. The large louvres have obviously given some cause for concern in the past because additional piers, made of engineering bricks, have been fitted to all the louvres in which steel reinforcing bars running parallel to the outside wall are bedded. These columns in the East and West louvres are butted up to the foundation beams thus minimising any ability of these to move.

The louvres are well covered by plastic mesh (around 20mm hole size) and panes of glass have been fitted which cover the louvres from sill level to approximately one-quarter the full height. Unfortunately most of these panes are now cracked and /or broken. The plastic mesh keeps out birds but not wind driven rain and we would recommend that 'Galebreaker' is fitted (see 8.2).

6.0 Bell Installation

6.1 The Bell

The bell is hung for full circle ringing on ball bearings that replaced the original plain bearings in 1973.

Details taken from "The Church Bells of Derbyshire" by Pat Halls and George Dawson are as follows.

Bell No	Diameter mms. (ins)	Weight (cwts-qr-lbs.)	Date	Founder
1	845 (33.25)	7-1-4	1874	John Taylor

The bell, with its original canons, (cast in loops on top of the bell) is fixed to the wooden headstock by means of metal straps which all show excessive signs of corrosion. The bell has been drilled centrally (in 1973 it is assumed) to take an independent crown staple to support the clapper. The bell had not been $\frac{1}{4}$ turned (turned through 90°) since being cast but there was a noticeable difference in wear at the point of clapper impact on the sound bow from one side of the bell to the other. This was put down to the bell having been chimed far more than it had been rung full circle.

The clapper pivot bearing showed very little 'free play' in both the side to side and up and down axis.

The three bolts holding the gudgeon pin to the wooden headstock on the North side were found to be slack. These were tightened, in the process of which one of them sheared. On examination it was found that this bolt had been partially drilled through when they had been fixing the U-bolt to hold the stay in place.

Note this bolt was replaced on 3rd. April 2003.

The stay itself was slack and on full circle ringing came into contact with the wooden frame. These bolts were also tightened to ensure that the stay was clear of the frame. The slider was free but the metal rod at the pivot point is heavily corroded.

The wheel is in good condition but the bellrope has been joined by a knot between the inner rim of the wheel and the vertical support where it is attached to the headstock.

6.2 Frame Layout (see figure 4)

The wooden frame is secured to the foundation beams by six tie rods. Two each on the beams running east-west and one each on the cross beams. During the inspection it was discovered that the tie rods on the main beam running east- west by the south louvre were slack. This allowed the frame to lift on this side when the bell was being rung full circle and the movement was visible to the naked eye. All the tie rods show excessive corrosion and no tightening was attempted for fear of shearing one of the rods. The timbers themselves all appear in good condition with no sign of rot or woodworm. The clock hammer is fitted to strike the bell on the North side. All the fixings, supports and actual mechanism appeared to be in good condition, easily operated and well lubricated.

The frame itself is mounted above the sill level of the louvres where the tower is naturally weakened. It is thought that this may very well have contributed to the need for extra piers being installed in recent years.

7.0 The Spire

Looking above the bell it was noted that the bricks appear to be eroding away. Engineer's bricks had replaced the original bricks around all the windows in the spire and cement had been applied to large areas of the existing brickwork in an effort to limit any more erosion.

8.0 Recommendations

8.1 Replace the six tie bars holding the frame to the foundation beams, all metal support straps holding the bell to the headstock, and slider pivot.

This work is best carried out by a professional bell hanger. (list of names and addresses attached)

8.2 Fit 'Galebreaker' to all the louvres at the frame level. This is a strong PVC coated, woven polyester sheet with tiny closely spaced holes that allow circulation of air through the tower but exclude wind driven rain. Wind driven rain hastens deterioration of the bell frame and fittings. (The Derby Diocesan Association of Church Bell Ringers has bought a roll of this material and can supply any reasonable amount at a cost of £15,65 per metre).

8.3 Replace bell rope.

8.4 General clean up around frame and the bell. (cement and dust).

8.5 The wooden frame should be given a good wire brushing and then treated with Cuprinol wood preservative or creosote to maintain the timbers in good condition.

8.6 Do not ring full circle – chime only until 8.1 is completed.

9.0 Conclusions

Assuming recommendations 8.1- 8.6 are carried out the bell is safe to ring. It is suggested that when these have been carried out both a frame and tower movement check should be undertaken.

Please note that this advice has been given in good faith, but no liability can be accepted.

Report written by _____

Robin Lyon, Bell Consultant to the DDA

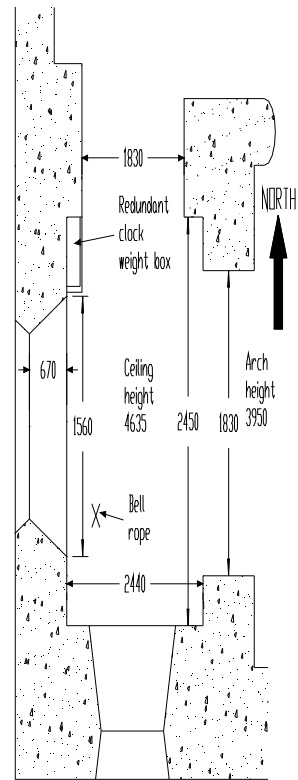


FIGURE 1 - GROUND FLOOR

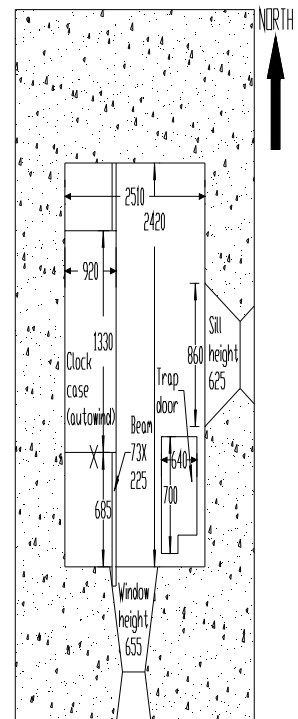


FIGURE 2 - CLOCK ROOM FLOOR

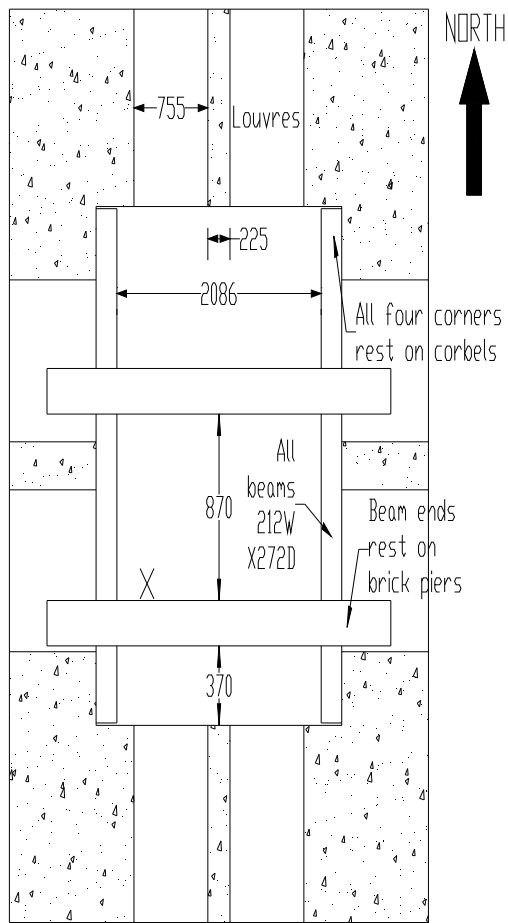


FIGURE 3 - FOUNDATION BEAMS

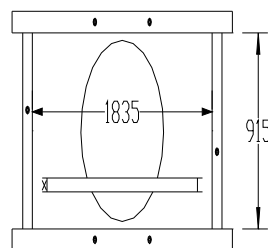
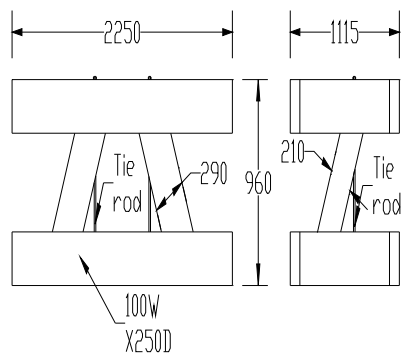


FIGURE 4
FRAME
LAYOUT

LOCAL BELLHANGERS

-) Hayward Mills Associates,
Unit 1, Palin Street,
Radford,
NOTTINGHAM
NG7 5AD
Tel 0115 978 8388
Fax 0115 978 9233

-) Eayre and Smith Ltd.,
45, Blanch Croft,
MELBOURNE
Derbyshire
DE73 1GG
Tel 01332 864266
Fax 01332 865444

-) John Taylor Bellfounders Ltd.,
The Bellfoundry,
LOUGHBOROUGH
Leicestershire
LE11 1AR
Tel 01509 212241
Fax 01509 263305