

Derby Diocesan Association of Church Bellringers Consultant's Report	Report DDACB 04/08
Church of St. Giles, Killamarsh Inspection of Bells	Issue Date 13/06/08

1.0 Introduction

The inspection was requested by Mr. R. Green on behalf of the PCC and carried out by Mike Banks and Robin Lyon on Wednesday 4th. and a return visit on Wednesday 11th June 2008. The clock mechanism (manufactured in 1903) is in the process of being overhauled by Potts of Leeds and it was thought prudent to have an inspection of the bells carried out at the same time.

2.0 General

The six bells are housed in a tower at the West End of the church. The stone tower is of substantial section and appears in good condition. The original stonework in the North and East louvres had been replaced and the stonework in the West and South louvres was showing some signs of decay but had not reached the stage of needing replacement. There are clock faces to North and South walls below the louvres at the bell chamber level and the flat roof appears to be in good condition.

Ringling is carried out on the ground floor and a door in the South West corner allows access to a spiral staircase. The clock room is reached by climbing 30 steps and the bell chamber is reached by continuing up the spiral staircase for a further 14 steps. The bells are regularly rung for church services and weddings.

3.0 Ringing Room (figure 3).

The main door to the church is located on the South wall and the ringing area is located at the West end of the church behind a wood and glass screen. The area is used for storage but this in no way affects the ringing of the six bells, the ropes of which fall in an acceptable ringing circle. Good natural light enters the area through the large window in the West wall. The wooden ceiling is 6 metres above the floor level. A rope guide frame, to which is fitted a single fluorescent light, is positioned 1500mm below the ceiling. This height is safe in the event of a ringer being carried up following the breaking of a stay. Clock hammers are fitted to strike bell numbers 1,2,3 and 6 and the hold off mechanisms are located on the North and South walls and very positive.

4.0 Clock Room (figure 2).

Reached by climbing 30 steps of the spiral staircase located in the South West corner. The Potts clock mechanism is well fitted and in no way interferes with any of the rope falls. The area is lit by a single incandescent bulb which gives an acceptable level of light to the area. The floor of wooden construction has a trapdoor fitted and the ceiling of wooden construction is 2450mm above the floor level. The ropes on bells 1,4, & 5 are 'drawn' and the floor pulleys

appeared to be in good condition. Bell 6 is 'drawn' slightly without the need for a pulley. The area was clean.

5.0 Bell Chamber (figure 1).

The bell chamber is reached by climbing a further 14 steps. Entry is through a doorway, where once was fitted a wooden door. This now lies against the South wall but does not interfere with the clock mechanism or ringing of the bells full circle. There is no artificial lighting fitted to the area and natural light enters through the louvres which all have wooden slat type fittings over the bottom halves. This allows birds to fly in and nest in the area. One bird was present during our inspection. Nesting material and bird droppings were noted between the walls and the foundation beams and on the screeded concrete floor. This debris retains moisture and promotes favourable conditions for the onset of rot in adjacent timbers. (It is also a health hazard). The debris should be removed and the louver openings covered in "Galebreaker" porous sheeting. This would cut down on the natural light into the area and artificial lighting would be required for fitting of muffles and any required maintenance work to be carried out safely. The wooden roof appeared to be in good condition with no sign of water ingress.

6.0 The Bell Frame

The frames are of cast iron H section securely fixed to wooden foundation beams which run North –South and are keyed into the walls with no sign of insect attack or rot. The tops of the H section cast iron frames are bolted to wooden beams which are not keyed into any of the walls. When three bells (1,2 and 3) were rung individually there was no detection of movement at lower level where the foundation beams are keyed into the walls. At the higher level there was a small amount of movement detected in the North – South line (this is the direction in which all the bells swing). We recommend that wooden wedges be driven into the gaps between the beam ends and the North and South walls to stabilise what little movement there is. All the metal work requires wire brushing and painting over.

The debris that has accumulated over the years between the walls and the foundation beams should be removed and the wood, although showing no signs of decay should be treated with wood preservative.

7.0 The Bells

All six bells have had their canons removed and hung on ball bearings for full circle ringing. They all swing in a North South direction.

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

Bell No.	Diameter mms. (ins)	Weight Cwt.	Date	Founder
1	733 (28.875)	5.1.1	1843	J Taylor
2	756 (29.75)	4.3.15	1843	J Taylor
3	813 (32)	5.3.0	1843	J Taylor
4	838 (33)	5.3.14	1843	J Taylor
5	914 (36)	7.1.14	1843	J Taylor
6	1041 (41)	10.3.26	1843	J Taylor

It is thought that all the bells have been quarter turned about the vertical axis to present an unworn surface to the clapper. There were signs of wear at the clapper point of impact over a wider area than is usually observed. This may be due to the observations made on the clappers (see under 8.2). The wear is acceptable and none of the bells appeared to be cracked.

8.0 Bell Fittings

8.1 Headstocks, bearings and gudgeon pins

Of wooden construction the headstocks showed no signs of rot or insect attack and were securely fixed to the bell by metal holding bolts. These appeared to be tight and showing little sign of corrosion. All the ball bearings were 'leak free' and there was no detection of 'rumble' when the any of the bells was swung through a small arc. The gudgeon pins were securely fixed to each wooden headstock by securing bolts and all appeared tight and in good order.

8.2 Clappers

All of wrought iron construction and showing little sign of wear at the impact point with the bell when being rung full circle. The clapper bearings all appeared in good condition with little signs of play in the bearing.

It was however possible to 'rotate' the clappers on bells 1,2,3, and 4 through 360 degrees. Even though all the clappers appeared to be swinging in the correct line (at 90 degrees to a line drawn through the centre line of both bearings) this situation is unacceptable and all the clappers should be removed and refurbished. It is thought that initially when the bells were rehung the leather washer fitted between the clapper assembly and the head of the bell created enough friction to stop this happening. Over the years the leather washers have deteriorated and dropped out leaving the clapper free to swing over a wider arc. There appears to have been a manufacturing problem as the clapper locating nut and bolt is tightening down onto the round section of the crown staple and not locating in the milled out section designed for the purpose of stopping the clapper rotating. (see diagram 1).

8.3 Stays and Sliders

All appeared in excellent condition.

8.4 Pulleys

Some signs of wear but all free to rotate in their housings with no 'locking up' on the sidewalls.

8.5 Wheels

The return visit on Wednesday 11th. June was made to investigate the problem of the rope coming off the wheel when ringing both bells 2 and 3. and a 'one off' occurrence of a jamming of rope on bell 1. All these bells were rung full circle with both Mike and myself observing from a safe position in the bell chamber.

The wheels for bells 2 and 3 are quite close together and any slack rope ringing can cause a problem with ropes 'interfering' with each other. This not helped by the fact that both wheels are not perfect circles and the wheel on Bell 3 is also running 'out of line'. On bell 2 the

end of the rope was not properly tied in with the result that approximately 8 inches of rope was flapping around. This could also cause a problem if the ringer on bell 3 was ringing with a slack rope. We are almost certain that the jamming of the rope on bell 1 was caused by the rope becoming entwined with part of the hammer striking mechanism which is very close to the normal run of the rope when the bell is being rung full circle.

We had noted on our first visit that the top and bottom halves of the wheels on bells 3,4, and 5 were not pulled tight together and this should be attended to. At the same time the metal tie rods from the spokes to the headstock should be repositioned to try and improve the alignment on bell 3.

The araldite repairs and the fitting of new wooden support around the garter hole made to the wheel on bell 6 several years ago were still in good repair

8.6 Ropes

It was noted that the rope on bells 1,2 and 5 were looped round one of the spokes before being tied off in the normal way. The rope on Bell 2 is showing signs of fraying around the garter hole and should be raised to present a newer part of the rope to this wear point.

8.7 Clock Hammers

When the bells are in the 'hold off' position there is no problem and all the linkages appear in good order. When the clock hammers are in their normal at rest position they are all resting on the bell. This could lead to cracking of the bells and the leaf springs that the clock hammer shafts fall against when striking should be repositioned.

9.0 Recommendations

1. All the clappers should be removed and new crown staples fitted with the clapper locating groove milled in the same plane as the clapper locating nut and bolt.
2. Adjust the leaf spring positions to stop the clock hammers resting on the bell in the 'at rest' position.
3. Clamp and tighten the wheel halves together on bells 3,4, and 5. Alter the metal tie rod positions on bell 3 to correct the alignment.
4. Remove all the debris from the Bell Chamber paying special attention to the areas between the walls and the wooden foundation beams.
5. Fit "Galebreaker" to cover the whole area of each louvre. This is obtainable from Mr. John Cater at a price of £15.65 metre.
6. Adjust rope position on bell 2.
7. Drive in wooden wedges between beam ends and North and South walls at upper level.
8. After the fitting of galebreaker some form of artificial light would be required to carry out any work in the bell chamber.
9. Wire brush all the metal work in the bell chamber - frame holding bolts, headstock holding bolts etc. and then paint with red oxide, an undercoat and gloss topcoat. Alternatively two coats of Hammerite paint could be applied.
10. Treat all the wheels and foundation beams with a good quality wood preserver.

10.0 Conclusions

It is understood that DIY labour is not readily available so I have attached a list of professional bell hangers who would be willing to quote for the work on the clappers and leaf springs.

The condition of the wood and metal in the bell chamber was far better than we would have expected from the open louvres but we still strongly recommend the painting and fitting of galebreaker which should give even longer life and lower maintenance costs.

Advice given in good faith but no liability is accepted.

Robin Lyon

Bell Consultant to the Derby Diocesan Association of Church Bellringers

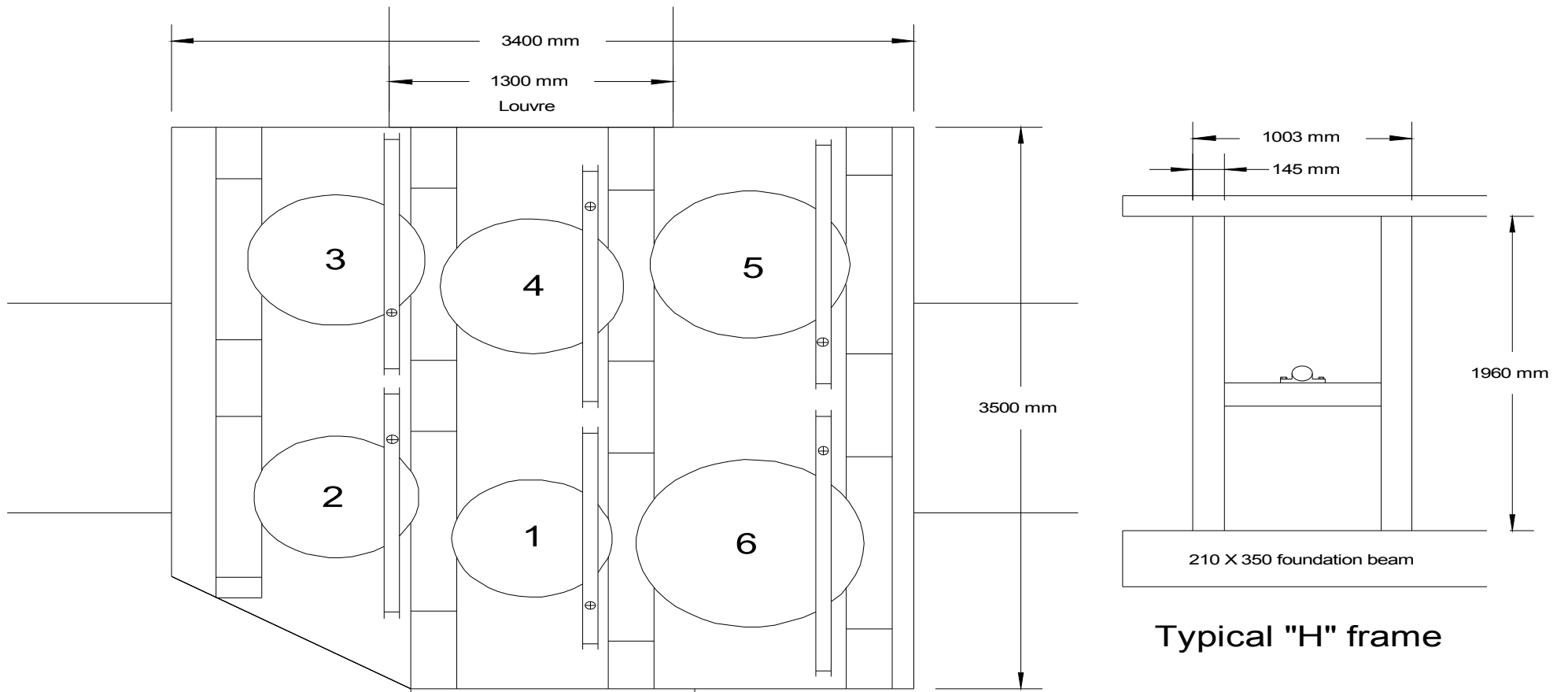


FIG1 BELL CHAMBER LAYOUT

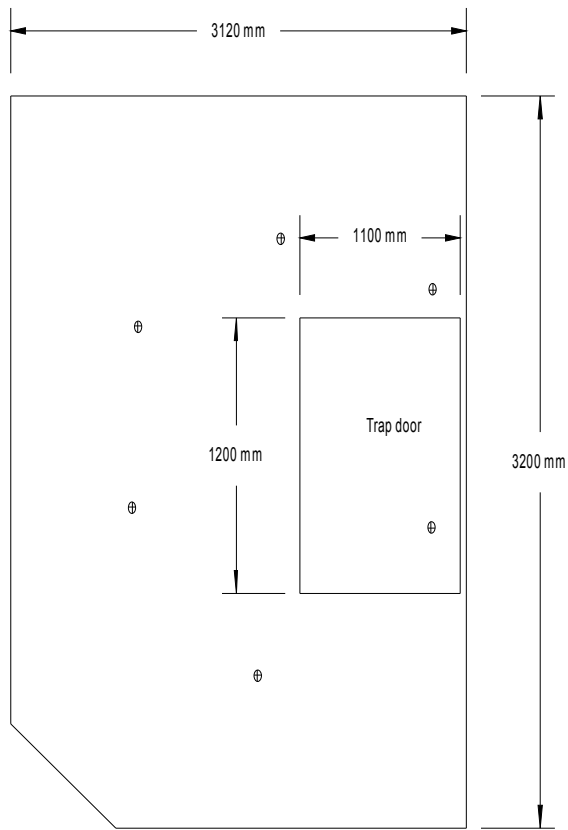


FIG 2 CLOCK ROOM

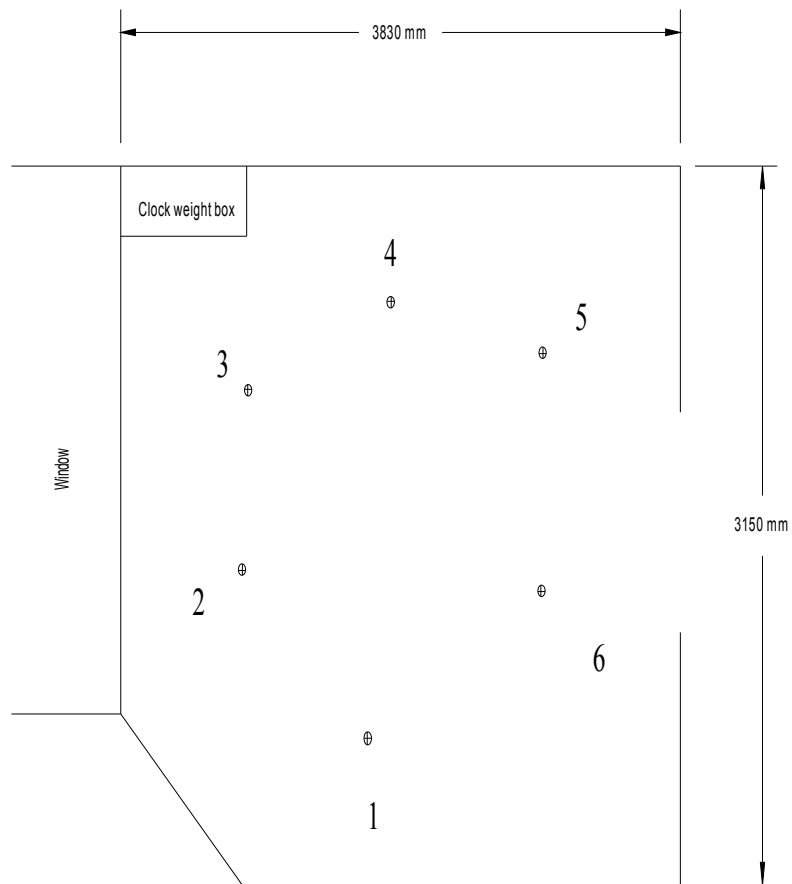
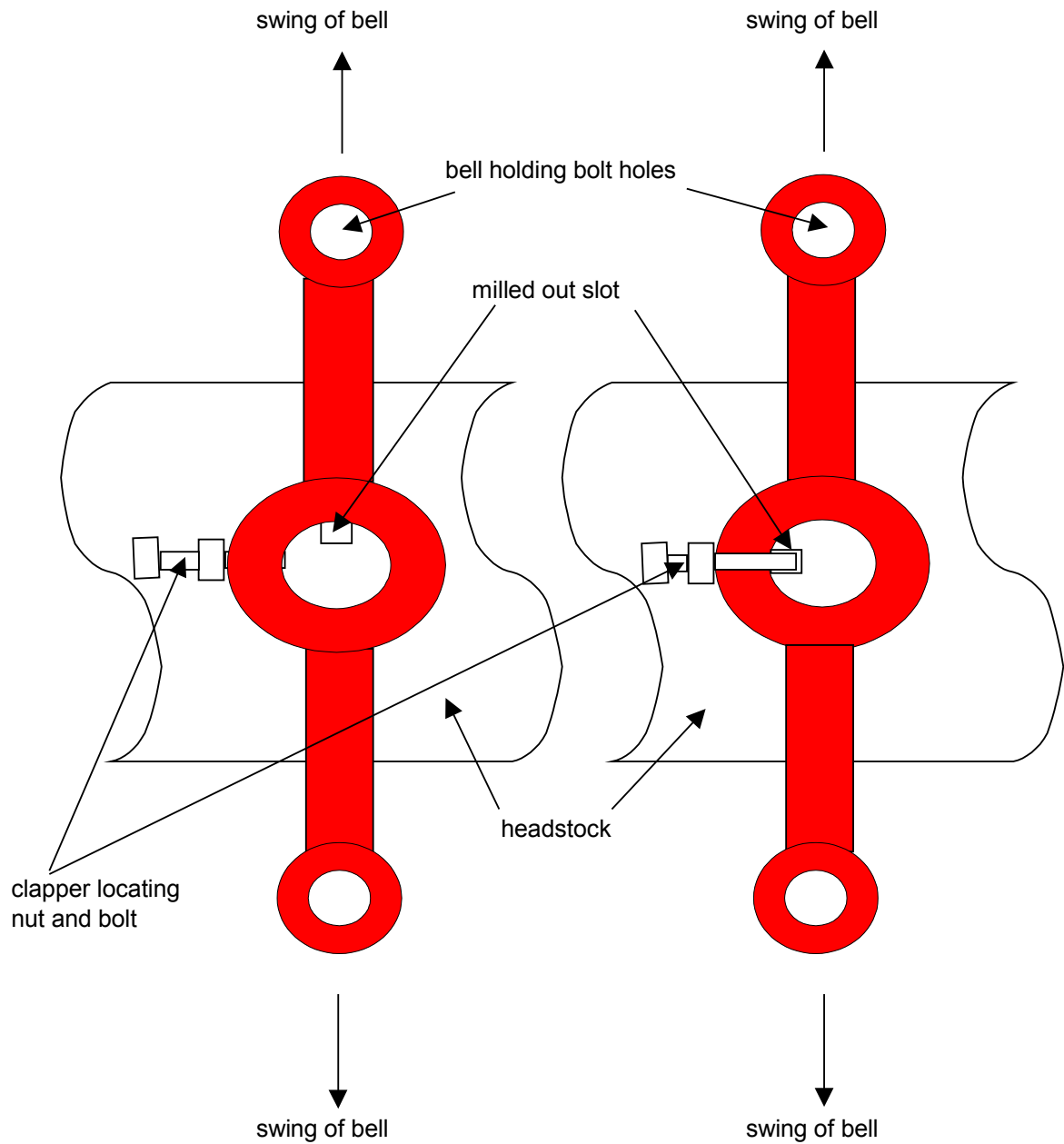


FIG 3 RINGING ROOM



VIEW LOOKING FROM DIRECTLY ABOVE HEADSTOCK

LEFT HAND SHOWS SET UP AS AT PRESENT which is **WRONG**
 clapper assembly location is only held in place by end of locating bolt on threaded section of crown staple.

RIGHT HAND SHOWS CORRECT INSTALLATION
 clapper assembly cannot rotate due to being 'held in place' by locating bolt

DIAGRAM 1
 NOT TO SCALE