

Derby Diocesan Association of Church Bellringers Consultant's Report	Report No. DDACB 06/05
Inspection Of Bell Installation at St James' Church, Whitfield Parish, GLOSSOP	Issue Date 10/06/05

1.0 Introduction

The inspection was carried out by Mike Banks and Robin Lyon on Wednesday 1st. June at the request of Mrs. H. Collard, secretary to the Parochial Church Council. The eight bells are rung full circle only occasionally as they do not have a regular band.

2.0 General

The eight bells are housed in a tower at the North West corner of the church. The tower appears to be of sound stone construction with no obvious signs of structural weakness. There are clock faces to all aspects. Ringing is carried out from a ringing chamber accessed from the main entrance to the church by means of a staircase and a large counterbalanced trapdoor. The clock room containing the clock mechanism (at present inoperable) is reached by climbing a vertical box section ladder and through another counterbalanced trapdoor. Access to the bell chamber from the clock room is by climbing a similar type vertical box section ladder and sliding another trapdoor to one side. The original eight bells were installed in 1884 and described by Taylors in 1930 as having a "terrible tone". In 1931 the bells were recast and rehung on ball bearings in a Cast Iron 'H' frame surmounted by a low sided cast iron frame by Gillett and Johnston.

3.0 Ringing Room (see figure 1)

The ringing room is reached by climbing a wide staircase. At the top of the stone step section is a cabinet containing the Ellacombe chiming mechanism. A set of wooden steps then leads to a large padlocked wooden trapdoor. This is counterbalanced and held open by a simple catch which is attached to one side of the vertical wooden ladder.

The room is almost square in section with plastered walls and there is plenty natural light from the floor level windows fitted into the North and West walls. The ringing floor bisects these windows and whilst the floor has been extended into the North facing window recess this is not the case with the west facing window and a gap of 750mm X 710mm is present. Further natural light is supplied by windows on the North, East, and West aspects which are bisected by the clock room floor.

The eight ropes fall in a good circle with the normal ringing position for both Bell No. 5 and Bell No. 6 being on the closed trapdoor position. The eight ropes for operating the Ellacombe chimes are neatly arranged in the North East corner adjacent to the ringing position for Bell No 7.

Almost centrally placed in the wooden floor is a large bell removal trapdoor.

A 48mm diameter steel strut to support the clock mechanism is fixed into the North Wall which in no way interferes with the ringing of any of the bells. The ceiling is supported on two Reinforced Steel Joists (RSJ) running North - South and two RSJ's close to the South wall running East - West. It is 3.215 metres from the floor which is safe in the event of a ringer being carried up following the breakage of a stay. A rectangular box containing the clock pendulum hangs down from the ceiling to which a single light is fitted. The clock weights are enclosed in a wooden cabinet located in the South West corner.

4.0 Clock Room (see figure2)

The clock room is reached by climbing the vertical box section ladder and opening the counterbalanced trapdoor which rests back against the wall. On the clock room side of this trapdoor is fitted a single pulley through which runs the rope for Bell No 5.

Note no attempt should be made to open the trapdoor when Bell No. 5 is in the raised position.

The walls are natural stone and the size is slightly larger than the ringing room. There are windows on the North, East, and West walls which bisect the floor and on the South side a door gives access to the church roof.

The area is dominated by the clock mechanism which is mounted centrally on a wooden frame running North East - South West. It was manufactured by J.W. Benson of Ludgate Hill, London and the manual winding positions are located on the South East side which is furthest away from the trapdoor. At present the clock is not operational and it's position completely blocks any exit route for removal of the bells internally within the tower. The floor is of wooden plank construction approximately three inches thick. The low ceiling (1.68 metres) to which are fitted several bell cranks for the clock chiming, is of tongue and grooved wooden construction. In the South West corner of which, there were serious signs of wet rot. There is a single light fitted to the West Wall and the area was clean and bird free. The ropes pass through the room all in boxes or flapper boards apart from the fifth. Pulleys are fitted at both floor and ceiling level on Bell No's 1,2,3,5,7,& 8.

The condition of these pulleys is as follows -

No 1 rope - floor pulley OK. ceiling pulley OK.

No 2 rope - floor pulley fitted on ball bearings OK. Ceiling pulley on ball bearings OK.

No 3 rope - floor pulley slightly grooved but free running on ball bearings. Ceiling pulley slightly grooved but OK.

No 5 rope - floor pulley slightly grooved but free running. Ceiling pulley - slightly grooved but free running.

No 7 rope - needs greasing but serviceable.

Ceiling pulley - grooved and needs greasing and new grease cap. Serviceable.

No 8 floor pulley - fitted with ball bearings and OK. Ceiling pulley - OK

5.0 Bell Chamber (figure 3 & figure 4)

Access is gained by climbing the vertical box section ladder and pushing the light construction hatch to one side. The louvres are all covered in wire netting which has been externally fitted and the West louvre has been blocked up by wood to keep the weather out. Although the floor area was in need of a good sweeping there were no signs of bird debris. Apart from the limited natural daylight there is a single light bulb fitted to the West Wall. Moving around within the confines of the chamber is not easy due to the various ropes and pulleys at ground level and there is no recognised route to the bells at the higher level.

6.0 The Bells

All eight bells are hung for full circle ringing on ball bearings. Details (taken from "The Church Bells of Derbyshire" by Pat Halls and George Dawson) are as follows

Bell No.	Diameter mm. (ins)	Weight cwt	Date (approx)	Founder
1	664 (26.125)	4-0-22	1931	Recast by Gillett and Johnston
2	686 (27)	4-2-18	1931	Recast by Gillett and Johnston
3	711 (28)	5-0-9	1931	Recast by Gillett and Johnston
4	768 (30.25)	5-2-11	1931	Recast by Gillett and Johnston
5	813 (32)	6-3-6	1931	Recast by Gillett and Johnston
6	883 (34.75)	7-3-23	1931	Recast by Gillett and Johnston
7	972 (38.25)	10-1-19	1931	Recast by Gillett and Johnston
8	1092 (43)	14-3-8	1931	Recast by Gillett and Johnston

All the bells show very little wear at the point of clapper impact on the sound bow. None of the bells had been quarter turned about the vertical axis to present an unworn surface to the clapper.

The Ellacombe chiming can be carried out on the bells and clock hammers are fitted to Bell No's 2,3,4,7, & 8.

7.0 The Lower (Cast Iron H Type) Bell Frame (see figure 3)

Bells 1,3,5, and 8 are carried in a cast iron H frame which is mounted on four steel foundation beams which are keyed into the wall as shown in figure 3. The foundation beam running along the North wall is further supported by 3 stone corbels. The foundation beams (12 ins x 5 ins) are mounted 490mm above the wooden floor which makes moving around under the bells possible but one has to take care in avoiding the extra ropes and metal rods associated with operating the Ellacombe and clock chiming.

Although of adequate size and showing little sign of corrosion it is recommended that the beams should be either wire brushed by hand, and for particularly bad areas an angle grinder fitted with a wire cup brush should be used. The use of eye and ear protection is essential when undertaking this task. Also a watchful eye should be kept out for the fire hazard. Where bare metal is reached a three coat paint application should be applied as follows -

- Red Oxide primer
- Grey undercoat
- Gloss top coat

If only surface rust is removed then a good undercoating followed by the gloss coat will suffice.

The H type cast iron frame (2metres) high, mounted on the foundation beams, should be treated as per the foundation beams with particular attention being paid to the fixing bolts.

8.0 The Upper (Cast Iron Lowside) Frame (see Figure 4)

Bells 2,4,6, & 7 are carried in the upper frame which is mounted on four reinforced steel joists which are keyed into the wall as shown in figure 4 and supported at each corner by a stone corbel. These joists are bolted to the top of the H frame making a very solid and stable configuration. Inspecting and undertaking any repairs to these bells and fittings is extremely difficult and great care must be taken, not only in reaching the upper level but also when working there. The foundation beams and lowside frame, although of substantial dimensions, showed signs of neglect and the rust removal and paint treatment as specified for the lower level should be carried out with particular attention being paid to the holding bolts.

9.0 Bell components and fittings

9.1 Wheels

The wheels are fitted with eight segment cheeks that have been 'joined' by insertion of a metal plate. These plates are corroding to such an extent that the wood, for approximately 30mm on each side of this join, is being splayed out which eventually will interfere with the rope run over the wheel on the inside edge. Although we could not see any problems caused by this on any of the bells the situation should be monitored at regular intervals.

The wheels were securely fitted to the headstocks and the condition of the spokes was good.

Note this type of wheel construction appears to be the one used by Gillett and Johnston and we have seen a wheel where part of the cheek had broken off by the garter hole (the position where the rope passes through the wheel) and the bell was unringable due to the rope slipping off the wheel when being rung full circle.

9.2 Headstocks/ Bearings / Gudgeons

All of cast iron construction and supported by ball bearings fitted by Gillett and Johnston in 1931.

They would all benefit from rust removal and painting as described under Section 7.0

The ball bearing houses were inspected and all appeared to be oil tight. On No 4 bell the bearing caps are missing. Although the bearing housings were well packed with grease new caps should be fitted to stop the ingress of

foreign matter (dust, water, etc) which could eventually find its way to the actual bearing and cause a premature failure.

The bell holding bolts all appeared to be tight and the gudgeons (the supporting pin projecting either side of the headstock into the bearing housing) were inspected and visually acceptable.

9.3 Clappers

All clappers are of wrought iron construction carried by independent crown staples located through a central hole in the bell and headstock.

- Clapper No 1 - the crown staple is slack in the headstock and needs to be tightened. Pivot wear is acceptable

Note the crown staple is tightened by using the following procedure which should be carried out by two people with the bell in the 'down' (at rest) position.

Remove the old split pin which passes through the castellated nut on the headstock. One person should now lie under the bell and hold the clapper against the sound bow at the centre of the strike point. This will resist the applied torque to the castellated nut which the other person should now tighten down the threaded section of the crown staple until it is tight. After checking with the person under the bell that the crown staple is tight, line one of the slots in the nut up with one of the holes drilled through the threaded section and fit a new split pin. 'Splay' ends of the split pin out to locate in position. It may be beneficial to run some easing oil down the threads before removing the old split pin to ease the tightening. The person underneath should now check that the clapper is hanging centrally and striking the sound bow on both sides in the centre of the worn section. Any 'play' up, down or sideways felt by moving the clapper should be in the pivot bearing only.

- Clapper No's 2,3,4,5, and 7

Clapper is tight in the headstock and there is very little pivot wear.

- Clapper No 6

Clapper is tight in headstock but there is some sign of pivot wear but it is acceptable

- Clapper No 8

Although being tight in the headstock the swing of the clapper is not in the same axis as that of the bell. (Approximately five degrees out) It is difficult to assess how long the clapper has been in this position but it should be re aligned using the method described for Bell No.1.

Above the pivot bearing an inverted cast iron 'V' bracket has been fitted which connects with the hexagonal section of the clapper on both the hand and backstroke when the bell is being rung full circle. A 'dingler' is fitted to the end of the 'V' section on the side facing the East wall (backstroke) but is missing on the other side. It is thought that this mechanism has been fitted to stop the bell 'double clapping'. Although it

shows signs of wear the hexagonal section at the strike point with the 'dingler' appears to be sound. This missing 'dingler' should be replaced.

9.4 Stays/sliders

- Bell No 1 slider and stay both OK.
- Bell No 2 the slider is OK but the stay is of poor quality wood and both the holding bolts are loose. These bolts should be tightened.
- Bell No's 3,4,5,6,7, & 8 sliders and stays are OK.

9.5 Pulleys

- Bell No 1 double pulley shows some wear but is serviceable.
- Bell No 2 double pulley requires greasing.
- Bell No 3 double pulley is slightly grooved and requires greasing.
- Bell No 4 double pulley, one of which is split and the other is grooved.
Note this double pulley should be replaced with a new unit.
- Bell No 5 double pulley is badly grooved and jamming against the side wall - requires attention.
- Bell No 6 double pulley OK
- Bell No 7 single pulley fitted and is serviceable.
- Bell No 8 double pulley which is grooved and worn. Just serviceable.

9.6 Ropes

All ropes were serviceable apart from that fitted to Bell No. 5 which is badly worn where it passes through the garter hole and the one fitted to Bell No. 7 which although not as bad as No 5 will require attention in the near future.

10.0 Recommended Actions

1. Replace the single filament bulbs fitted in the ringing room and the clock room by double fluorescent fittings. It is suggested that two double fluorescent fittings are fitted in the bell chamber. One to illuminate the area where the lower bells are hung and another to illuminate the higher level.
2. Bell No. 1 - slacken off crown staple nut and retighten making sure that the clapper is striking the sound bow in the centre of the worn section.
3. Bell No. 2 - a. tighten both bolts holding stay in place.
b. grease spindle on double pulley. (bell chamber)
Note If any stays have to be replaced after breakage then use stays made out of ash.
4. Bell No. 3 - grease spindle on pulley. (bell chamber)
5. Bell No. 4 - a. replace double pulley with new unit. (bell chamber)
b. fit new grease caps to bearings.

6. Bell No. 5 - a. investigate cause of pulley jamming and replace with new unit if required. (bell chamber)
b. replace existing rope.
7. Bell No. 7- look to repositioning the existing rope by moving the worn area away from the garter hole or replace with new rope.
8. Bell No. 8 - a. slacken off crown staple nut and retighten making sure that the clapper is striking the sound bow in the centre of the worn section.
b. replace missing 'dingler'.
9. All the metalwork in the bell chamber should be wire brushed, bolts checked for tightness, and then painted with red oxide paint followed by an undercoat and gloss topcoat.
10. Monitor wheel segments at six monthly intervals.
11. Bell No. 7 - a. grease spindle on both floor and ceiling mounted pulleys. (clock room)
b. fit new grease cap.
12. The bells are tightly packed into the space available and moving around in the bell chamber is both difficult and potentially dangerous. It is strongly recommended that a minimum of two people are present when any work is being undertaken.

11.0 Conclusions

Due to the location of the clock mechanism removal of any large items from the bell chamber would have to be through the louvres. In view of this difficulty it is in the interest of all parties to make sure that the bells and associated fittings are maintained in good working order. A watching eye should be kept on the wheel segments joints as attempting to replace a half wheel could prove a difficult and costly exercise. The bells were individually rung and no problems encountered. There is no reason why future generations should not enjoy the bells if the remedial actions outlined above are carried out.

Advice is given in good faith but no liability is accepted.

Robin Lyon
Bell Consultant to the DDACB

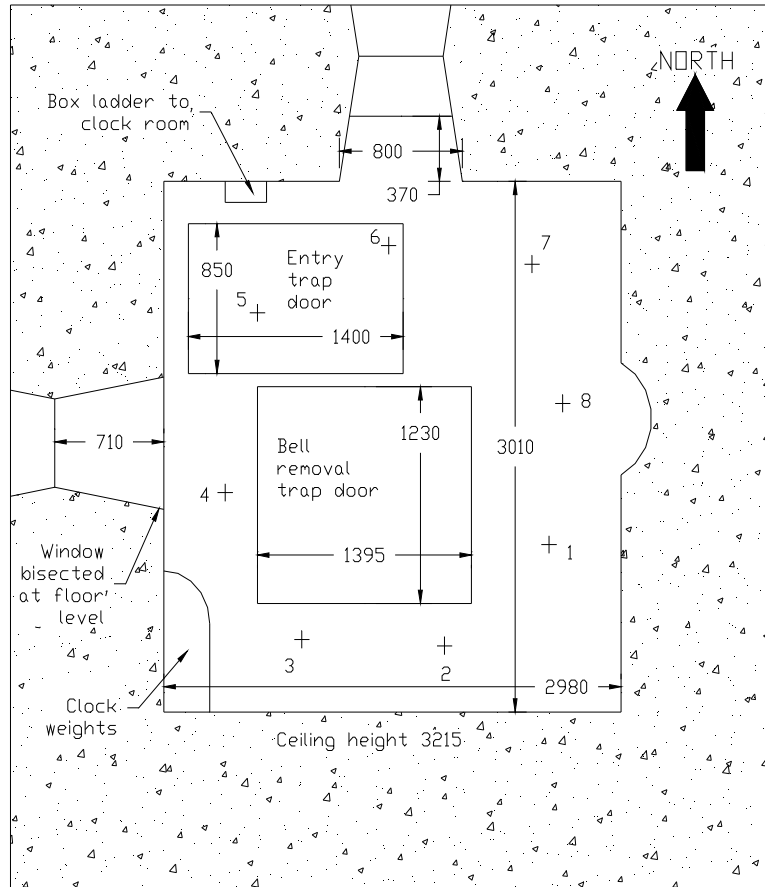


FIGURE 1
Ringing Room

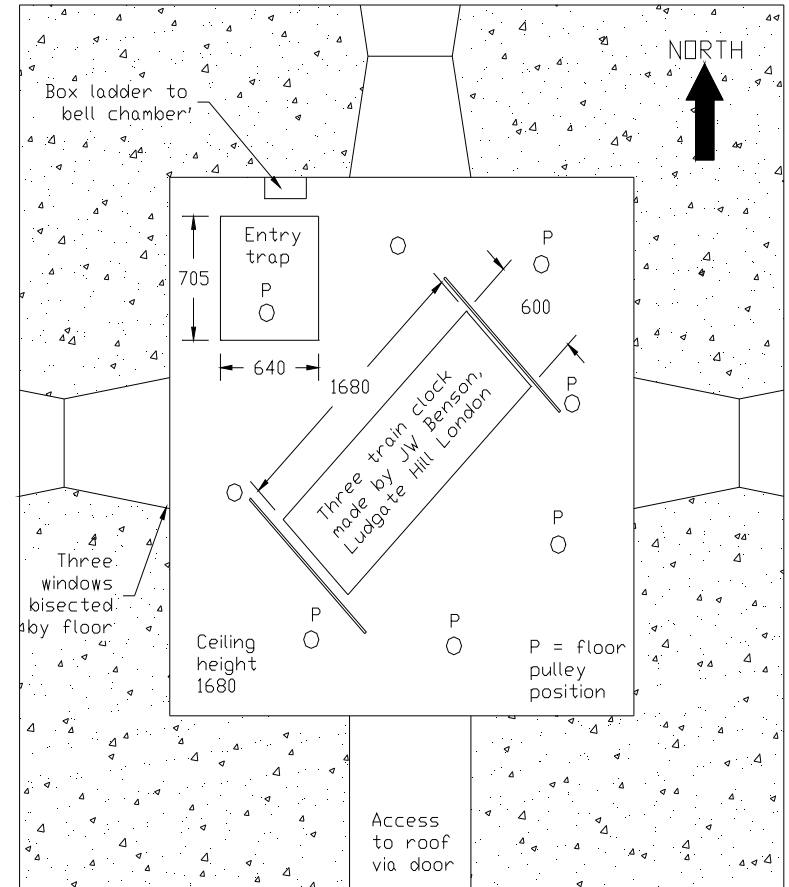


FIGURE 2
Clock Room

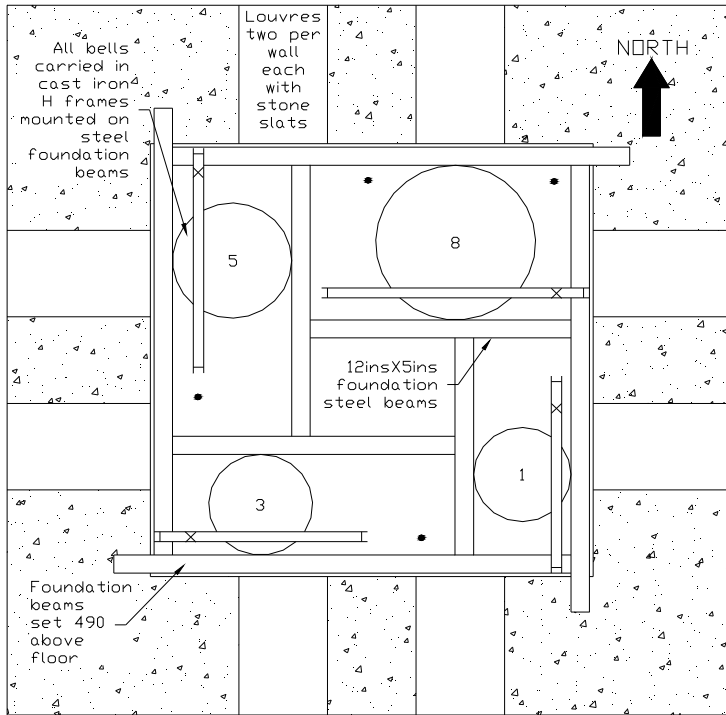


FIGURE 3
Bell Chamber
Lower Bell Frame

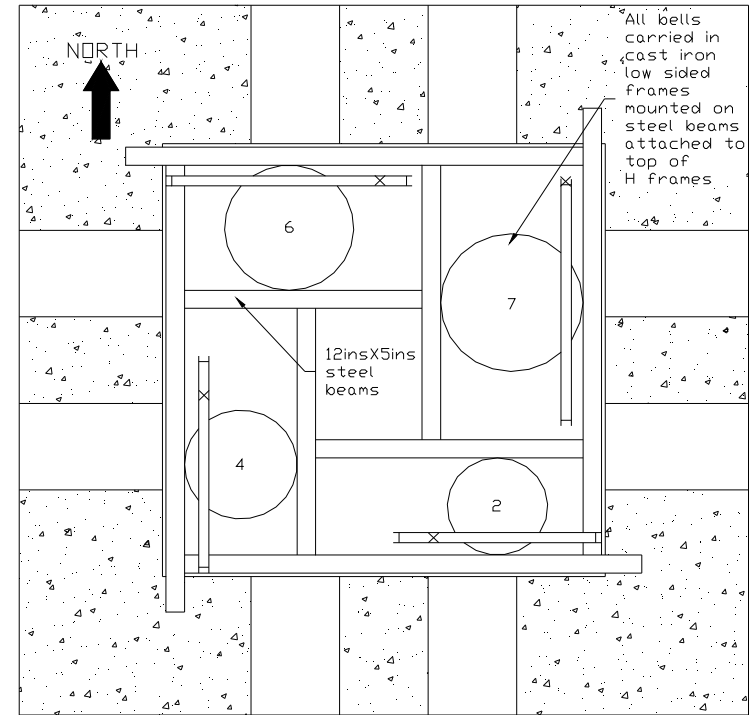


FIGURE 4
Bell Chamber
Upper Bell Frame