

<b>Derby Diocesan Association of Church Bellringers Consultant's Report</b>	<b>Report No. DDACB 01/05</b>
<b>Inspection of Bell Installation at St. Andrews, Radbourne</b>	<b>Issue Date 28/01/05</b>

## **1.0 Introduction.**

The inspection was carried out on 20<sup>th</sup>. January 2005 at the request of the vicar, the Reverend Michael Bishop. The three bells are rung full circle from the ground floor, but only on occasions.

## **2.0 General.**

The three bells are housed in a tower at the West end of the church. The tower appears to be of sound stone construction with no obvious signs of structural weakness. Ringing is carried out from the ground floor in a room accessed from the main body of the church. The clock room containing the clock mechanism is reached by climbing a heavy steel ladder. Access to the belfry, from the clock room, is by climbing a ladder which has to be moved into position. The three bells are mounted on a lowside wooden frame which is thought to date from c1800. In 1898 the second bell was recast, and all three bells rehung in the original frame.

## **3.0 Ringing Room (see figure 1).**

Entrance is gained from the main body of the church through a door which is normally closed and locked. The room measures 2.55 metres (East-West) and 2.71 metres (North-South) with a ceiling height of 3.76 metres. There is a small window in the East Wall and a larger window recessed back into the West Wall. A single bulb supplies artificial light to the room. The ceiling, supported on eight beams running East -West, is wooden boarded with a trap door opening in the North East corner. The floor of the room is stone flagged. The electrical intake is on the West Wall and it appears that the tower, and possibly the whole church was rewired in the late 1990's. The ropes fall in a good circle but due to the clock weight box fitted in the South West corner the ringing of Bell No 3 would be difficult for a novice ringer and the free standing ladder, which is used for access to the clock room, presents a similar problem for ringing Bell No 2. There are two free standing cupboards, one on the North Wall and the other in the South East corner behind the door when it is open. The area has also been used to store electric convector heaters used in the church.

## **4.0 Clock Room (see figure 2).**

The clock room is reached by climbing the metal free standing ladder which protrudes through the trap doorway. The area is of similar size to the ringing room and the floor is of sound wooden construction. The area is clean apart from

some metal stands. There is evidence of a chimney having been fitted in the North West corner (probably removed when the bells were rehung in 1898).

The clock mechanism mounted on an armchair frame is fitted in a case on the South Wall and appeared to be in excellent condition. The clock drive rod (approximately half inch diameter) to the single clock face, fitted on the South Wall, is supported in simple guides up the wall and through the ceiling. The clock weight box continues up to the ceiling. Natural light enters through a window in the West Wall and artificial light is supplied by a single electric bulb. The height to the ceiling/bell room floor is 3.63 metres below which are four main beams running East- West. The lowside wooden bell frame is secured through these beams by eight tie bars. These foundation beams are resting on two wooden beams running North - South. At the Eastern end the beam is supported on four equidistantly spaced corbels and at the Western end the beam is supported on the tower offset.

Access to the Bell Chamber is via a trap door which is located under Bell No.3. There is a free standing ladder in the clock room which has to be repositioned taking care to avoid the clock face drive rod.

### 5.0 Bell Chamber (see figure 3).

The chamber is almost square in section. The large louvres on all four aspects are covered by plastic sheet which was well fitted and in excellent condition. Although being fitted with larger 'holes' than "galebreaker" there was no evidence of bird ingress and/ or leaves in the chamber. One advantage the larger' hole' mesh has over "galebreaker" is that more natural light enters the chamber. In the South-East corner a fixed vertical ladder gives access to a wooden platform 920mm. wide running East-West fixed 1.4m. above the bell frame. From here a further fixed wooden ladder leads up to the roof trap. The roof appeared to be in good repair with no evidence of water ingress.

The single clock face is fitted below the louvre in the South wall. The drive mechanism is secured to the wooden frame with the gears being open to any ingress of dirt.

Although the bell wheels could probably be removed/refitted using the existing trap doors, removal of any of the bells would have to be via one of the louvres.

### 6.0 The Bells

All three bells are hung for full circle ringing on plain bearings mounted in a lowside wooden frame. 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	600 (23.625)	unknown	c1550	Henry 1 Oldfield
2	689 (27.125)	unknown	1897	John Taylor
3	705 (27.75)	3-0-19	1595	Henry 11 Oldfield

In 1898 the Canons were removed from Bell No's. 1 and 3 and both bells were 1/4 turned about the vertical axis to present an unworn surface to the clapper and retuned. Bell No 2 was recast and tuned to match.

Bell No.1 appears on the Schedule of Bells For Preservation compiled by the Council for the Care of Churches.

All bells show light/moderate, but acceptable wear at the point of clapper impact on the sound bow.

## **7.0 The Lowside Wooden Frame.**

The three bells, swinging East- West, are mounted on a lowside wooden frame secured to the foundation beams by eight tie bars. Four metal corner brackets are fitted to each bell pit at the top level to add further rigidity to the frame. The frame was in excellent condition with no sign of rot or insect attack. Carved into the frame near Bell No. 3 is 'REHUNG 1898'

## **8.0 Bell components and fittings.**

### **8.1 Wheels.**

All the wheels were in excellent condition but the metal fittings were rusty and need wire brushing and painting.

### **8.2 Headstocks/Bearings/Gudgeons.**

All these are of cast iron construction and supported on plain bearings let into the wooden frame. All the bell holding bolts were tight and the gudgeons (the supporting pin projecting either side of the headstock into the bearing housing) were inspected and acceptable although there is slight scoring on both gudgeons fitted to Bell No.2. The bearing housings require cleaning out and oiling.

### **8.3 Clappers.**

All clappers are made of wrought iron construction carried by independent crown staples located through a central hole in the bell and headstock. On Bell No's 1 and 3 the crown staple nut requires tightening. The wear on the pivot bearings and the strike faces was acceptable on all the clappers.

#### **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. After applying some easing oil to the threaded section remove the old split pin which passes through the centre of the screwed section rod above the nut on the headstock. The nut presently fitted should be replaced with a castellated one where the split pin actually 'holds' the nut in position to stop it loosening. One person should now lie under the bell and take the weight of the clapper whilst holding it against the sound bow at the centre of the strike point. This will resist the applied torque whilst the old nut is removed and the new one fitted. This should be run down the threaded section until the crown staple is tight. After checking with the person under the bell that the crown staple is truly tight one of the slots in the nut should be lined up with the hole drilled through the threaded section and a

new split pin fitted. 'Splay' the ends of the split pin out to locate in position. 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.

#### **8.4 Stays/sliders.**

The stays on all three bells are presently only held in by friction. Two new bolts need to be fitted to each stay to hold them in position. In the interests of safety it was agreed that frame deflection tests (by ringing each bell full circle) would not be carried out until the stays had been secured properly to their respective headstocks.

The sliders were all in acceptable condition.

#### **8.5 Pulleys.**

- Bell No 1 single pulley free to turn with acceptable wear on plain bearing. Running face of pulley grooved but acceptable.
- Bell No2 single pulley comments as for Bell No 1.
- Bell No 3 single pulley free but needs lubrication.

#### **9.0 Clock Hammer.**

The clock hammer strikes the outer edge of Bell No 3. The linkage, although complicated, appeared to be in good condition. At present the 'holding off' mechanism for the hammer (required if Bell No 3 is to be rung full circle) is located in the cupboard which houses the clock mechanism and there is no way of operating the system from the ringing room.

#### **10.00 Recommended Actions.**

1. Fit two bolts through each stay to secure in position.
2. Replace the ringing room single filament bulb by a double fluorescent fitting and a new fitting should be installed in the bell chamber if access is required after dark.
3. 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 topcoat.
4. Clean out plain bearings and replace oil. (Ensure absolute cleanliness to avoid introducing grit into the bearings).
5. Grease pulley on No.3 bell or look to replacing with new ball bearing unit.
6. Clear the ringing chamber of stored equipment

7. Although the metal ladder used to gain access to the clock room is sturdy and not easily moveable it is not fixed and some means of securing the ladder in position when being used should be sought. Failing that another person should be present to 'hold' the ladder in position when it is being used.
8. A sign should be prominently displayed in the ringing room as to whether the clock hammer is OFF or ON. Thought should also be given to fitting some mechanism for operating the clock hammer from the ringing chamber.

## **11.0 Conclusions.**

Due to the 'loose' stay situation checks on the frame movements and state of the bearings under load could not be checked. The rest of the installation appeared sound. Instead of putting any money into new ropes, which appear to be satisfactory, it is suggested that the money would be better spent on attending to the recommendations listed above.

Advice given in good faith but no liability accepted.

Robin Lyon  
Bell Consultant to the Derby Diocesan Association of Church Bellringers

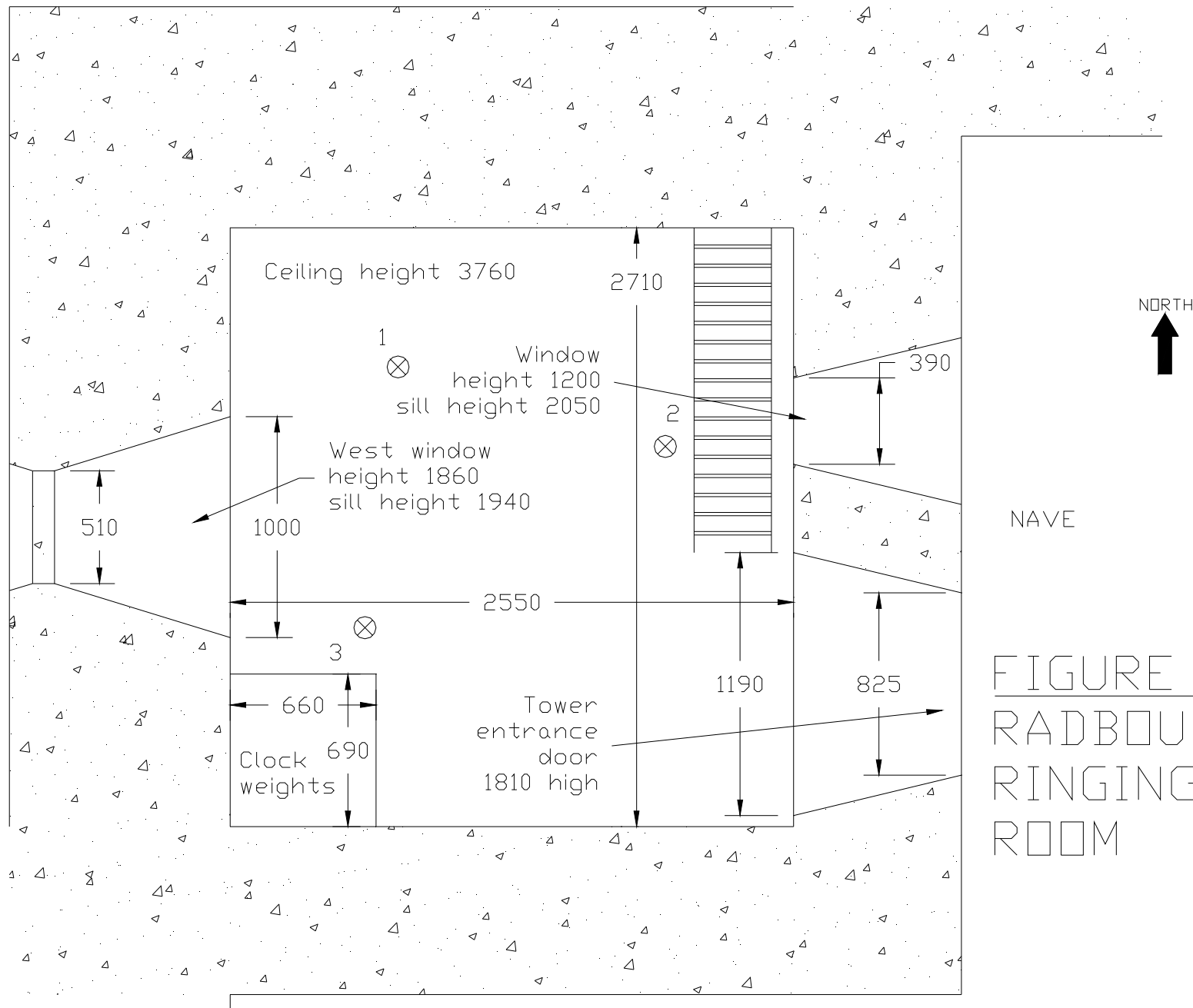
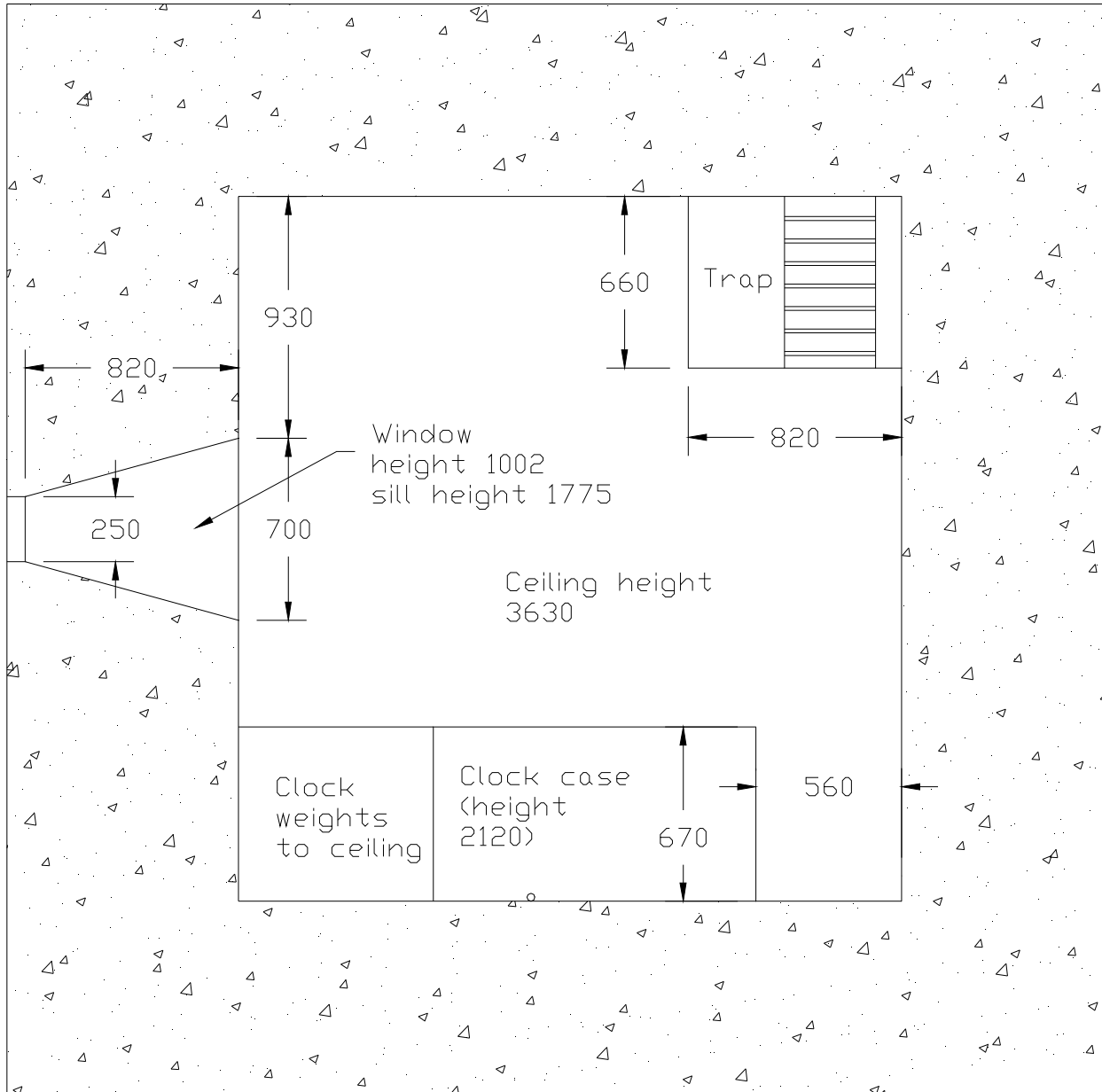


FIGURE 1  
RADBOURNE  
RINGING  
ROOM



NORTH



FIGURE 2  
 RADBOURNE  
 CLOCK  
 ROOM

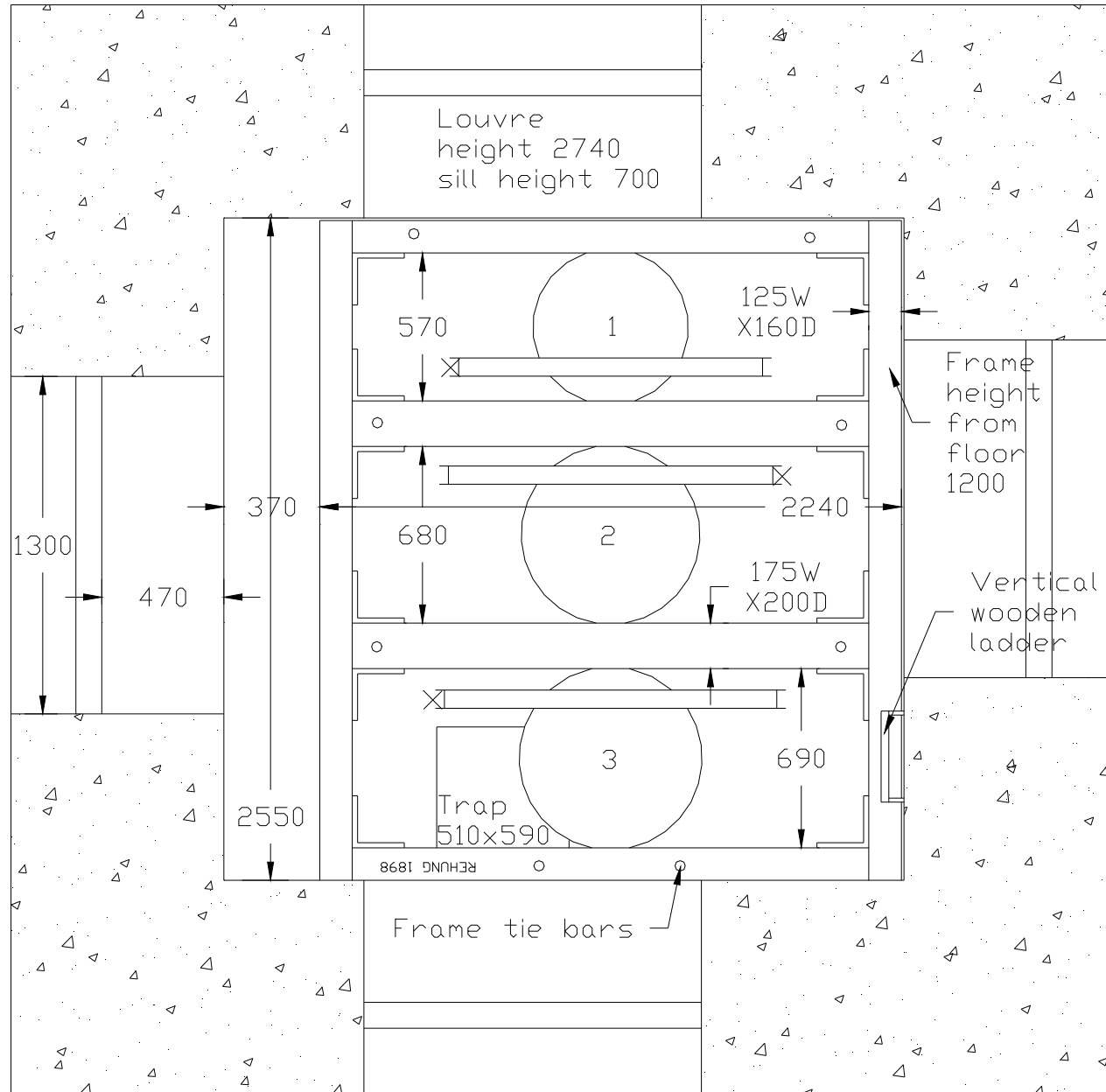


FIGURE 3  
RADBOURNE  
BELL  
CHAMBER