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Jennifer Malcolm <jenmalcolm@hotmail.com>

Dear Jen,

St Catherine's Church, Baglan - Bells

In accordance with your request I called and inspected the bell installation on Tuesday 9th July. I would like to thank you for arranging for the tower key to be available, Andrew John for meeting me and for refreshment provided. I report on my findings as follows.

Bells

The principal details of the six bells are:

Bell	Dia.	Founder	Date	Weight
Treble	701 mm	John Taylor & Co of Loughborough	1899	246 kg
2 nd	752 mm	John Taylor & Co of Loughborough	1899	285 kg
3 rd	795 mm	John Taylor & Co of Loughborough	1899	321 kg
4 th	834 mm	John Taylor & Co of Loughborough	1899	346 kg
5 th	925 mm	John Taylor & Co of Loughborough	1899	469 kg
Tenor	1047 mm	John Taylor & Co of Loughborough	1880	651 kg

The bells were all cast with flat heads in the modern fashion and they have been tuned on the five-tone principle and are a fine sounding peal.

The treble and tenor bells have been quarter turned previously and have moderate wear on the their soundbows in the old clapper strike positions and all six bells have moderate wear at the points that they are currently struck.. No work is required to the bells themselves at present.

Fittings

The bells are all hung from hollow box-section cast iron headstocks which are in very good condition structurally. The tenor would originally have been hung from a timber

headstock and its present headstock is dated 1963, which is presumably when the bells were last thoroughly overhauled and the ball bearings fitted.

The headstocks are fitted with turned steel gudgeons which are hot riveted fastened into them and all the gudgeon fittings appear to be firm. The gudgeons rotate in double-row, self-aligning ball bearings mounted in heavy section cast iron plummer block housings. Mercifully it would appear that the bearings have been left well alone and there are no signs of the felt seals being ruptured by over-greasing. The headstocks are in quite rusty condition.

Leather insulation pads have been fitted between the bell heads and the headstocks and all except that of the 5th, which has been replaced in recent times, are disintegrating and will eventually fail. The pad of the 5th bell has been replaced with two sections of material with a gap between and this will allow dampness and air to reach the centre bolt of the clapper assembly, which is one of the most vulnerable areas of the installation for corrosion.

The independent wrought iron clappers and cast iron crownstaple assemblies are a mixed bag but they are generally in serviceable condition. The clappers of the treble and tenor are of pear top pattern with a hardwood bush set into the top eye. They pivot in forked crownstaples which are fitted with mild steel clapper joint pins. The clappers of the other bells are of forked top pattern, with quite thick tapered shafts, and are fitted with mild steel clapper joint pins. They are suspended from solid cast iron staples with a hardwood bush fitted into the central eye. All of the clapper joint pins are fitted with Stauffer lubricators to allow periodic lubrication of the clapper joints. The caps of the lubricators of the 3rd, 4th and 5th bells are missing. The clappers have large flats on their balls, the clapper bushes of the 2nd, 4th and tenor are slightly worn, that of the treble is moderately worn whilst those of the 3rd and 5th are badly worn.

The 5th bell is held onto its headstock by four hexagon headed bell support bolts which are relatively new and were most probably fitted along with the new bell insulation pad. The other bells have square headed bell support bolts and all are in satisfactory condition.

There are slight signs of wear in the soling on the top sections of the wheels from the passage of the bell ropes. The wheels are given additional rigidity by pairs of profiled metal wheel-strengthening irons which are in rusty condition.

All six bells have hardwood rollers running on ball bearings, mounted in hardwood roller boxes. The rollers are all of double pattern, to draw the bellropes under the wheels to improve the rope circle in the ringing chamber. All of the rollers have slight to moderate wear on their surfaces from the passage of the bell ropes and some appear to be a little loose on their bearings. The roller box of the 2nd comprises a front piece and two end blocks, the back of the assembly being formed from the cill of the bellframe which has been drilled to take the pivot pins of the rollers.

All of the bells are fitted with plain stays which are of appropriate size and in good order. The nuts are missing from a number of the stay fixing bolts, the top bolt is missing from the 3rd stay and the bolts are generally in poor condition.

The stays engage on curved steam-bent ash sliders, the free end of the treble slider has become quite badly worn on its underside from passing back and forth along the runner whilst those of the five larger bells are only slightly worn. The fixed ends of the sliders pivot on vertical spikes driven into a timber block that is nailed to the side of the frame cill beneath the wheel. The sliders of the five smallest bells run on a softwood runner fitted with two hardwood end stops that adjust the 'set' of the bell at handstroke and backstroke. The end of the tenor slider runs across the top of the frame cill to which the stop blocks are fitted.

The cast iron floor bosses on the bellchamber floor, which protect the bellropes as they pass through, are quite rusty and their surfaces have consequently become rough.

Each of the bells has been fitted with a plain type Ellacombe chime hammer to allow the six bells to be chimed by one person from a chime rack in the ringing chamber. Cast iron purpose-made pulleys are screwed to the bellchamber floor to redirect the chime cords from each bell to the chime rack and these seem to be running freely.

Bell frame

The bells are hung in a composite frame comprising cast iron 'H' section members mounted on a substantial timber grillage, the tops of the casting being tied together by a further set of timbers. Due to the fact that the spire squinches begin at roughly bearing height of the bellframe the outer arms of the 'H' castings in the four corners are cranked inwards, although not by a sufficient amount in some places and consequently the stonework has had to be chiselled away in order to avoid them.

Four pairs of castings are fixed down to longitudinal timbers, the ends of which rest on a continuous timber ring which in turn rests on 24 stone corbels which project from the tower walls, their tops being approximately 340mm above bellchamber floor level. Each corner of the tower has a short cant section beneath the squinches, being approximately 1 metre in length. A steel flat is fixed down to the top surface of the main timbers to brace them apart, running in the north south plane across the centre of the tower.

There are four longitudinal top timbers, the ends being tied with members along the length of the east and west walls with short returns along the cant walls. A north-south timber member spans across the centre of the tower above the steel flat in the lower grillage.

The metalwork of the frame is in quite rusty condition and the timberwork is a little dry.

The frame is of '*Bellframes*' type 8.3.C and of layout 6.4, the bells all swinging in the east-west plane.

General

There is good access to the ringing chamber via a polygonal stair turret set against the southeast corner of the central tower. The ringing chamber floor is of stone set atop the stone vaulting of the ground floor chamber and it has a large circular opening with a timber hatch to allow bells to be hoisted and lowered internally. At just over 4 metres high the ringing chamber is of ideal proportions for bells of this size.

Access to the intermediate, or clock, chamber is via a steeply raked wooden stairway. At this level the floor is lead covered on account of the four un-weather-screened window openings the sills of which are some distance below the floor to allow rainwater runoff. Once again there is a central hoisting hatch, lead covered, for hoisting and lowering bells.

This chamber is 3.7 metres high and the ropes run from floor to ceiling in timber chutes to reduce rope flap. The chute of the 5th is loose at its bottom end and it needs securing permanently to reduce the risk of damage to the bellrope. The chute of the 3rd has already been dealt with.

There is a three-train flatbed clock by Smith of Derby housed in a timber case which the makers have at some time converted to electric winding. It strikes the Cambridge Quarters via external drop hammers on the treble, 2nd, 3rd and tenor bells and the tenor has a second hammer to strike the hours. There is an external dial face over the top section of the west window opening, which would normally be in the bellchamber but is in fact one of the clock chamber windows.

The bellchamber is reached via another steeply raked timber stairway and through an access hatch below the end of the 3rd bell pit. The 60mm thick bellchamber floor has a central hoisting hatch.

At the level of the upper timbers of the bellframe is a set of four moderately-sized spire lucarnes at the cardinal points which are well netted to prevent entry by birds. However they are no guard against the elements and no doubt copious amounts of wind-borne rainwater enter the tower during storms.

Recommendations

The bells installation is generally in sound condition and there is no work that needs to be undertaken urgently. However it would be a good idea for the PCC to budget to undertake some work within the next two years to put the installation back into first class order.

The clappers would benefit massively from re-bushing, building up and grinding to shape to remove the flats on their balls which will affect the sound greatly. This should be carried out with an appropriate type of welding rod, compatible with wrought iron.

New hardwood rollers, running on ball bearings, should be fitted in the existing roller boxes.

The cast iron ceiling bosses should be wire brushed to remove all surface corrosion and painted with rust inhibiting paint.

All bells should be fitted with new bell insulation pads, including the 5th, with no gaps to allow unseen deterioration of the centre bolts. The existing bell bolts are probably of better quality than those available today and should be cleaned and reused if possible.

As the bearings are now some 56 years old it would perhaps be sensible to lift each bell in its pit, strip down and clean the bearings and refit them with using fresh grease.

The metalwork of the bellframe and bell fittings should be thoroughly cleaned down and well painted with a solvent-based system which would usually involve a primer coat followed by two gloss coats. Single coat applications, such as those readily available from DIY shops, should not be used as they have been find not to last in the bellchamber environment.

Once all of the work has been undertaken it would be a good idea to ensure that the worst of the weather is kept out. This would best be done by fitting boarding to the openings immediately above the bellframe, preferably with a closable hinged flap for use when severe weather is expected. Exterior grade boarding such as Sterling board would be ideal for this purpose, treated on the outside with matt black waterproof paint and on the inside with good quality wood preservative solution.

I trust that you will find my report helpful and please do not hesitate to contact me if there are any questions that you would like to ask with regard to the bell installation or my report.

Yours sincerely,

Peter Hayward