ST. MICHAEL WITH ST. MARY, MELBOURNE

February 28th 1994

Inspection carried out in connection with proposal to rehang bells in a new frame and augment eventually to 12 bells.

TOWER

The present eight bells are rung from the ground floor in the area currently in front of the altar which is also used by the choir. Some of the ringers have to stand in the choir stalls to ring. This is not a happy situation; fortunately it will change for the better when the church is re-ordered in the near future. There are three sets of rope guides to deal with the extremely long rope draught.
There are wooden louvres 5' 8 1/2" wide 10' 10" high on all four sides of the tower. They are wire-netted and boarded up, as they should be, to prevent birds getting in. The bellchamber is dirty. lumps of stonework, some of them quite large, have become dis-lodged from the wall of the tower and lie on the bellchamber floor.

BELLS

No.	diameter	weight	founder	date
1.	2' 1 1/2"	4-2-7	J. Taylor	1887
2.	2' 2 1/2"	5-0-5	J. Taylor	1887
3.	2' 4 1/2"	5-0-4	J. Taylor	1882
4.	2' 6 1/2"	5-3-24	J. Taylor	1882
5.	2' 9"	7-1-2	J. Taylor	1882
6.	2' 10 1/2"	8-1-6	J. Taylor	1882
7.	3 ' 2 1/2"	11-0-0	J. Taylor	1882
8.	3' 7 1/2"	15-1-24	J. Taylor	1882

INSCRIPTIONS

1. crown: J.TAYLOR & CO. FOUNDERS LOUGHBOROUGH
waist: OCTAVE COMPLETED IN THE FIFTIETH YEAR OF
THE REIGN OF QUEEN VICTORIA 1887
opposite: JOSEPH DEANS, VICAR
WILLIAM RICE, CURATE
W. J. WOOD)
W. COOK) CHURCHWARDENS

2. Same as treble.

3. crown: J.TAYLOR & CO. LOUGHBOROUGH 1882
waist: I SWEETLY TOLLING MEN DO CALL
TO TASTE OF MEATS THAT FEED THE SOUL
A.D. 1882

4. crown: J. TAYLOR & CO. FOUNDERS LOUGHBOROUGH 1882
waist: A.D. 1882

5. Same as fourth.

6. crown: J.TAYLOR & CO BELLFOUNDERS LOUGHBOROUGH 1882
waist: A.D. 1882

7. Same as fourth.

8. crown: J. TAYLOR & CO. BELLFOUNDERS LOUGHBOROUGH 1882
waist: JOSEPH DEANS VICAR
W. BRIGGS)
F.F. FOX) CHURCHWARDENS
A.D. 1882

The bells themselves are in good condition; none have been quarter turned. All, except No. 8, have small canons.

BELL FRAME
This is a low-sided wooden frame dating from 1882. It is supported on four large timber beams (16" X 9") which run N to S. There are no supporting beams running E to W. The large beams sit in large pockets cut into the north and south walls. Wooden wedges and packing pieces have been fitted or driven in round the beam ends to try to hold the beams tightly in place in the pockets. Unfortunately the stonework of the tower tends to crumble rather easily, the wedges are no longer tight and the beam ends now fidget about when the bells are rung. The observed frame movement at the lower level was less than 0.5mm when the tenor and No. 6 bell were rung separately this is acceptable. However, the highly localised loading at the beam ends combined with the movement is causing distress to the surrounding stonework; in places one or two large stones have become dis-lodged. The ends of one of these large beams (under bell No. 5) has partially rotted away. There are wedges between the lower beam and the tower wall at the NE corner. These wedges have caused severe distress to the wall. The rest of the bellframe is quite robust and well designed; there are plenty of vertical tie rods to hold the top frame firmly down on to the bottom frame. However, mention should be made of a previous visit by the writer to Melbourne during a dry summer several years ago. At the time the bells had become difficult to ring; advice was given that these vertical tie rods needed to be tightened in order to reduce frame movement brought about by the shrinkage of the wood. This movement was causing an increase in the dynamic loading on the tower walls it may have contributed to the distress of the stone work.

STAYS AND SLIDERS
There are conventional stays and sliders - all are serviceable.

HEADSTOCKS
These are all timber and all are serviceable.

WHEELS
All are serviceable

CLAPPERS
All are wrought iron, except No. 8 and No. 6 which are spheroidal graphite cast iron. All the wrought iron ones are flattened at the point of impact. Some clappers are oddstruck.

GROUND PULLEYS
Those on Nos. 4 and 5 need overhauling; the others are serviceable.

BEARINGS

Ball bearings throughout; no problems, so deemed serviceable.

GENERAL COMMENTS

The bell installation is in average condition for its age. Recent neglect has allowed an accumulation of dirt to develop under the bellframe. The bells can continue to be rung indefinitely in their present state.

The largest cause for concern occurs at the interface between the wooden support beams and the masonry: viz:

There are no E-W beams built into the walls to distribute loads.

The end of one support beam has rotted.

The walls crumble in the area round the support beam and allow fidgeting. In the light of the proposal to rehang the bells no solution to the above concerns is considered or offered.

PROPOSAL TO REHANG BELLS AND AUGMENT TO TWELVE

EAYRE AND SMITH drawing 11/11/92

The proposal to rehang the bells in a new metal frame at the present level in the tower (and augment to twelve) and provide new fittings throughout will overcome all the above reported concerns, viz:

(1). The new metal frame with supporting grillage having elements running both E-W and N-S will be grouted into all four walls of the tower. The sideways load due to the ringing of the bells singly or in combination will therefore be distributed to and be resisted by all four walls of the tower acting as one unit. Stresses in the stonework and deflections of the tower will be reduced. In the present wooden frame loads from individual bells are applied to the walls of the tower in a more concentrated fashion.

(2). The number of points at which the vertical and horizontal loads are transmitted the tower will be increased from eight to fourteen; thus the loads imposed locally will be less.

(3). The grouting in of the grillage ends will transfer the loads more kindly to the surrounding stonework and it will moreover eliminate local fidgeting found with the present at the beam ends.

(4). The design of the metal frame will be much stiffer than the present wooden frame. There will be no vertical tie rods to tighten in dry weather. Thus there will be a smaller sideways dynamic loads on the tower because of less frame movement.

BELL LOADS

The weights of the bells swinging in each direction are as follows:

CURRENT

bell no.	N-S	bell no.	E-W
3	5-0-4	1	4-2-7
4	5-3-24	2	5-0-5
7	11-0-0	5	7-1-2
8	15-1-24	6	8-1-6
total	37-1-24		25-0-20

PROPOSED

bell no	N-S	bell no.	E-W
4	4-1-11	1	4-0-23
5 (1)	4-2-7	2	4-1-1
6 (2)	5-0-5	3	4-1-4

9 (5)	7-1-2	7 (3)	5-0-4
10 (6)	8-1-6	8 (4)	5-3-24
		11 (7)	11-0-0
		12 (8)	15-1-24
total	29-2-3		50 0 24

The total bell weight swinging N-S is reduced from 37 cwt 1 qr 24 lbs to 29-2-3.
The total bell weight swinging E-W is increased from 25-0-20 to 50-0-24.
The weakest wall is the south wall which has two spiral stairways, thus to reduce the bell mass swinging parallel to the E-W wall is a good feature of the proposal. The strongest wall is the north wall; bells 11 and 12 swing adjacent to this wall, again a good feature of the design.
The total bell mass swinging E-W is acceptable (even though it is 35% more than currently experienced the by the N-S walls) because of all the factors mentioned above. Plus the fact that the bell forces from individual bells only combine instantaneously in time if the bells strike together (i.e. fire) this is an extremely rare occurence (indeed it would have to be organised to for it to happen).
It is concluded that the proposed frame design is acceptable and any other independent structural report is unnecessary in this case.

THE BELLS
The present eight bells will be quarter turned but not be retuned as the main strike notes are approximately in tune. This is the informed choice of the people at Melbourne and the bell founders. The new bells will be tuned to match. This is also the informed choice of the people at Melbourne and the bell founders. Their choices are respected. The bells will be hung on metal headstocks with new fittings throughout. Detail specification is awaited.

ROPE GUIDES
The present three sets of rope guides will need to be changed to accommodate more bells located differently to the present ones.
There is no definitive detail design at present, only sketches.

SOUND CONTROL
There is an expressed intention to install permanent/adjustable sound control.
There is no definitive design at present, only suggestions of what might be done.

WORK ON THE INSIDE OF THE TOWER
There is an expressed desire to do repair work to the inside of the tower. This should be phased in with the bell work.
A programme schedule of work has not yet been produced. It is recommended that one should accompany the faculty application.

Advice given in good faith no liability accepted.

G.A.HALLS