

23, PARLIAMENT STREET,
HULL.

March 21, 1923.

To the Building Committee of the Eserick Church Council,

Gentlemen,

ESORICK CHURCH.

I beg to submit the following report on the works which are required to effect a satisfactory reinstatement of Eserick Church.

While the works recommended follow in the main what existed before the fire, and, where not otherwise described, represent a reinstatement pure and simple of the previously existing conditions, they involve some considerable modifications. Some of these arise out of the injury to structure and details caused by the fire; others consist in the elimination of costly materials, such as marble and granite, elaborate tiled floors, stone-carving, etc., and the substitution of others less ornate and expensive, but entirely suitable, which will not in any way detract from the dignity of the church; though they will introduce an element of greater simplicity, which I imagine will be necessitated by the funds which are likely to be at your disposal.

The injuries to the masonry may be divided into two categories:— (1) those which affect the structural soundness of the building, and (2) those which are merely unsightly, and do not cause any structural weakness of importance. Generally only those in the first category are included in the following recommendations and the corresponding estimates, because it seems to me to be desirable to distinguish what is absolutely necessary. Those in the second category are dealt with in paragraph No. 18 below.

This report deals separately with each part of the building, and the reference numbers which precede the several paragraphs correspond with the same numbers in the estimates attached to the report.

NAVE AND AISLES, &c.

1. NAVE ARCADE, &c.

The marble piers of the nave arcade, with their carved stone capitals and granite bases, have been entirely ruined by the fire, and are beyond any repair. They must be completely rebuilt, and the damaged springer-stones of the arches repaired. The brick foundations of the piers have also suffered considerably, and must be rebuilt, in brickwork in cement; whether new concrete foundations will be required cannot be determined until the piers have been taken down. This work will involve the centering of each pair of arches, and the needling and shoring up of the walls, as each pier is removed and rebuilt. I recommend that the new piers be built of Portland stone, as a cluster of shafts with moulded capitals, as shown in elevation on the accompanying sketch A, and in perspective on the sketch B. The latter sketch shows that the piers will not look heavy, although their diameter will be some 3 inches more than that of the present piers, and their pronounced vertical lines will give them an effect of greater height. The capital, base, and plinth of the western respond pier must be renewed by letting in new, the mouldings of the capital and base corresponding with those of the detached piers.

The marble columns of the Baptistery will require repair and repolishing.

2. FLOORS.

The sleeper walls will require repair and partial rebuilding. The half-brick sleeper walls nearest to the two

outer walls (which formed a trunk connected with the first heating system) should be removed, and the external air-inlets should have fixed gratings substituted for the present ventilators. To ensure adequate ventilation beneath the wood floors, sufficient openings should be formed in the sleeper walls, with air-shafts through the width of the paved floors. The ground surface beneath the wood floors should be covered with a layer of cement concrete.

The floors of the seating spaces would be boarded on wood joists, and should be level with the floors of the alleys — not raised a step above them. The remains of the tiled floors of the alleys, and of the open spaces at each end of the nave, must be taken up, and I suggest that stone paving should be substituted. The rough flags on which the tiles were laid can be lowered, and the stone paving laid upon them. Wood-block flooring to the alleys, etc., would cost ^{about £35} more than stone, as it would require a concrete bed. An improvement in the system of heating would make it possible to dispense with the objectionable floor gratings and trenches for heating pipes (see No. 20 below).

The shattered granite steps across the front of the Baptistry would be replaced by stone steps.

The ground-floor of the Tower would be treated in the same way as the Nave floor. *Stone?*

3. ROOFS.

The trusses of the nave roof were framed with a very high collar, with sharply pointed arched braces under them and the principal rafters. This form of truss would have caused considerable thrust on the walls, had not the arched braces been strengthened by curved wrought-iron fitch plates. It would not be safe to reproduce this type of truss.

Although the stability of the walls fortunately does not seem to have been seriously affected by the fire (this is probably due to the extreme rapidity of the fire), it would not

be safe to assume that they are as strong as they were before. Moreover, if the old drawings are to be trusted, the walls between the windows, where the principal strength of the wall should lie, are built hollow. It would therefore, in my opinion, be rash to adopt any form of roof-truss which would exert any oblique thrust whatever on the walls. In other words, the roof must have ties at the wall-head.

The sketch C shows the type of tie-beam truss which I think will best meet the conditions, and the struts under the tie-beams will cover the strips of brick behind the former curved braces. The roof would be boarded to the underside of the rafters, and across the collar-beam. Pitch-pine, left its natural colour, will ultimately look as well as did the former roof, though of course oak would be very much better if it could be afforded (the extra cost is stated in ^{the} estimates). The roof would be underlined with Willesden paper on boarding, with an air-space between the underlining and the tiles. The roof covering would be hand-made sand-faced tiles. For the eaves gutters, heavy cast-iron may well be used, instead of lead (which was indirectly the cause of the fire).

The tops of the walls and the gable ends will require considerable repair, to receive the roof, but the estimate does not include any repair to places where the projections of the gable copings have flaked off. The stone angel-corbels under the roof trusses are beyond repair, and will disappear.

The only objection to the tie-beam design of sketch C is that, seen from the chancel, the tie-beam would seem to cross the circular window at the west end. The objection does not seem to me to be of much account, or sufficient to veto the type of roof-truss which is obviously the safest.

Sketch D shows an alternative in the form of a hammer-beam truss, which was suggested by the Rector. For the reasons already stated, however, I should not like to trust this form of truss without iron tie-rods. Personally I should recommend the

design C in preference to D.

4.

The roof of the aisle would be constructed in a similar manner, with visible principal rafters, purlins, and boarding, in pitch-pine (or oak); with underlining as before, and covering of lead. Tops of walls to be repaired as before.

With reference to the suggestion that the nave should be roofed with reinforced concrete, as a fire-resisting material, the conditions are not very favourable. The roof-line is fixed by the existing gable-ends. The height of the circular window in the west gable necessitates the ceiling rising very high into the roof. It is essential that the structure shall be absolutely rigid in itself, and that it shall exert no thrust whatever on the walls. The accompanying sketch E shows a pointed barrel vault, with main ribs between each bay, dying away into the wall above the string-course below the clearstory. Logically these ribs should be the principal constructional members. But the consulting engineer who generally advises me on reinforced concrete construction does not consider that a structure of this kind, with the main ribs in reinforced concrete, could be made sufficiently rigid to eliminate thrust, which would be fatal. Sketch E embodies (with modifications) a suggestion which he has made. The principal constructional members would be steel trusses, which would be cased with fibrous plaster to form the main ribs. To steel purlins between the trusses would be attached "Hy-rib" (a steel lathing which eliminates the boarded centering which adds so much to the cost) to which would be applied the concrete, 3 inches thick, which would form the panels between the main ribs. The cornices and minor ribs would be of fibrous plaster, and the whole lower surfaces of the vault would be finished in plaster. The outer roof would have wood rafters, underlining, and tiling, as described above for the timber roofs.

In a church which I built just before the war, I adopted a somewhat similar construction with steel trusses, but the barrel-

vault was entirely of fibrous plaster, fixed to wood bearers between the trusses. I am not sure that the concrete on Ry-rib presents any very great advantages over this form of ceiling, in which there is very little combustible material.*

There would be no difficulty in constructing a roof of reinforced concrete, pure and simple, over the aisle, with reinforced concrete beams between each bay. The underside of the concrete would be divided by ribs into panels, and all finished in plaster. The upper surface and the gutter would be asphalted.

With regard to the cost, the nave roof as sketch E would probably cost rather more than the timber roof, and the aisle roof in reinforced concrete would cost rather less. Taking the two together, there would probably be no great difference in cost.

5. The roof of the Vestry over the Porch is too badly burnt to admit of repair. It should be reconstructed as before, with lead covering on boarding.

6. WINDOWS.

The stained glass in some of the tracery lights is comparatively uninjured, and can be repaired. The remaining window-lights — south windows of nave, clearstory windows, and aisle windows — can be glazed with clear glass in plain lozenge leading, wired to the existing saddle-bars where these remain, and to copper saddle-bars elsewhere. There should be one opening casement in each of the larger windows.

7. DOORS.

New oak doors will be required for the principal entrance (inner doorway of south porch), and for the Vestry (from the aisle). The entrance doorway is rather wide for a single door, and it may be worth consideration whether it should not be fitted with folding doors, opening outwards. If it remains a single door, the old wrought-iron hinges would be repaired and reused.

* A barrel ceiling is generally less satisfactory acoustically, when the church is not filled.

CHANCEL.

8. FLOORS.

These would be treated as described above for the nave — sleeper-walls repaired, concrete bed under the boarded floors of the stalls, etc. The tiled floors and steps are beyond repair, and new paving must be laid, on concrete beds prepared to receive it. The steps and paving may be of stone, the latter laid in squares. Black and white marble paving in squares would add about £100 to the cost.

9. ROOF.

The roof itself would be reconstructed in fir, as before the fire, with underlining, air-space, tiling, and eaves gutters, all as described above for the nave. The wrought-iron finial would be repaired and refixed. The hips of the apse will look better if finished with hip-tiles, instead of the former lead hips. The tops of the walls will require effective repair (as before).

10. The wood vaulting under the roof would be reconstructed precisely as before the fire, but in pitch-pine, left its natural colour, instead of fir. It would, of course, be much better to execute it in oak, if funds permit. Some of the stone springers of the vault are badly damaged, and I see no objection to cutting these away, and continuing the ribs in wood down to the springing-line.

11. WINDOWS.

These would be treated precisely as described above for the nave, with plain lead-glazing and clear glass, and with one opening casement in each window.

For masonry repair, see paragraph No. 18 below.

TOWER.

12. ARCHES UNDER WEST WALL OF TOWER (towards Aisle).

The column which forms the central support of these two arches is shattered beyond repair. The arches themselves do not

take any very great weight, as there is what seems to be an effective relieving arch in this west wall of the tower at a higher level. The arches must be centered, needled, and shored, and the column rebuilt, in Portland stone, with moulded capitals, etc., as shown on sketch A. The injured springer-stones of the arch must be replaced.

- 13 The wrought-iron screen, which was fixed under these arches, can be repaired, refixed, and painted.

14 ARCH UNDER SOUTH WALL OF TOWER (towards Chancel).

The condition of this arch presents one of the most difficult problems in the whole reinstatement. The jambs of the piers on each side have suffered considerable damage, the effect of which is most prejudicial on the west side, where the pier receives one-fourth of the whole weight of the tower. The damage to the arch is still more serious, for in some cases the stones have split through the full depth of both orders of the arch. These injuries seem to me to demand some effective measures of strengthening.

Probably the least difficult way of strengthening would be to insert a permanent centering of the arch, by erecting steel stanchions against the piers, based on sufficient foundations, and supporting a framed steel centering under the arch itself, all the steelwork being encased in concrete. This addition would be thinner than the arch itself, and, after its execution, it might be possible to repair some of the stonework which has suffered most injury. The result would of course be a considerable reduction in the size of the opening, but the opening which would be left would probably be sufficient for an organ of moderate size, and the organ-case might be designed to cover part of the filling.

The alternative of a complete reconstruction of the arch could only be effected by needling and shoring up this whole side of the Tower, which would require long steel shores, and would be

a very difficult and costly operation. The cost would probably be double that of the permanent centering suggested above.

15. MASONRY ABOVE THE GROUND-FLOOR.

The stone springer of the relieving arch at the south-west angle of the Tower is very badly shattered, and must be renewed, which will be another difficult operation.

Above this level, the brick lining of the Tower has saved it from more serious injury, and the repairs required will not be extensive, until we come to the uppermost (belfry) stage. Here the damage is much more serious than appears from below. I think that there can be no doubt that the cracks through the arches of some of the belfry windows, which extend through the cornice and parapet, already existed before the fire — probably caused by movement of the tall bell-framing with the ringing of the bells; it is possible that the cracks may have widened slightly when the bells fell and the roof was destroyed, for there is ample evidence of very intense heat here, but I doubt whether they have widened to any great extent. In any case, their repair will be a much less serious matter than the repair of the damage to the masonry of the belfry windows themselves. In five of the eight windows, considerable renewals of the window tracery will be necessary, as well as of jambs and mullions. Precisely how much renewal will be required, and precisely how it is to be done, cannot be determined until the outside of the tower has been scaffolded, and the windows can be examined from both sides. The parapet will also require repair, and possibly may have to be partly taken down and rebuilt. The amount inserted in the estimates for this work must obviously be regarded as merely approximate.

16. FLOORS, ROOF, &c.

The reinstatement of the ground-floor has already been mentioned above. A new oak door will be required to the east doorway of the Tower.

In view of the disastrous effect of the fire on the Tower, and of the fact that the organ (always very inflammable) will be below it, I think it would be prudent to construct the first-floorⁱⁿ/reinforced concrete, with armoured doors to the hatch for the passage of the bells.

The second and third floors would be boarded, on wood joists and beams, with hatches for the passage of the bells.

The roof would be reconstructed as before, in timber, with lead covering.

17. The Tower will require a lightning conductor.

GENERAL REPAIR OF MASONRY.

18. As stated above, the estimates for the preceding items include only such masonry repairs as are necessary to ensure structural soundness, and do not include repairs of injuries to the stonework which are merely unsightly.

The worst of these injuries are sufficiently obvious, and more will appear when the surface soundness comes to be tested, as it must be in the course of the reinstatement. The replacement of all damaged masonry would be extremely costly, and moreover it would certainly tend to weaken the walls to take out and replace such stones. I take it that any such wholesale replacement is entirely out of the question. The walls will still show signs of the disaster which the church has suffered. Where a thin scaling of the surface only has occurred, I take it that the masonry may remain untouched. Where the surface has not scaled, it must not be assumed that it is sound. Where the surface is reddened by the fire, the effect of the heat on the stone (oolitic limestone from Ancaster) has caused an expansion of the surface particles of the stone which has forced the surface forward, leaving a thin cushion

of air behind it — a kind of blister, so to speak. Much of the surfaces of this kind may be left, but where a gentle tapping shows that it is loose, it must come away, to prevent its falling off in future.

However, beyond these cases of merely superficial injury, there are others which are more unsightly, and which you would not like to leave. For instance, in the chancel, there are injuries to the jambs of the chancel arch, and to the walls, especially below the windows,* to which something should be done by way of repair. In estimating the total cost of the reinstatement therefore, some provisional sum should be included for cleaning down and pointing, and for such general repair of the masonry as the funds may permit. The amounts entered in the estimates under this head must therefore be regarded as merely provisional.

FITTINGS.

19. The planning and character of the fittings will require consideration when it is known what funds will be available. The amounts inserted in the estimates provide for the following:—
Nave Benches, of simple design, in oak.

Alternative for chairs.

Pulpit, in oak, with traceried panels, simply treated.

Choir Stalls, of simple design, in oak.

Kneelers (in place of altar-rail), in oak.

Altar, in oak (plain, to be covered by frontal).

In fitting the nave, it would be advisable to space the benches to the standard width of 3 feet from centre to centre, which is wider than the former spacing.

In planning the choir stalls, I suggest that the former middle alley should be suppressed, the choir entering their stalls from the east, and the clergy from the west. This may allow of a little increase in the length of the sanctuary (if the numbers of the choir will permit), as greater length than formerly would
* Oak panelling to the sanctuary walls below the sill-string would cost less than renewal of the stone facing.

permit a better arrangement of steps, etc. It is a question for consideration whether the usual altar-rail step should not be omitted; it is not really necessary with kneelers with a raised step, and its omission means less stooping for the clergy in the administration to communicants.

The estimates do not include frontals, dossal, or hangings, credence, and sedilia.

The following four items would be the subject of separate contracts.

20. HEATING.

I understand that Messrs. Richardson's installation was conditioned to some extent by the original heating system, and there were some features in it which it is not now necessary to reproduce. Pipes run in trenches covered by floor gratings are objectionable, as harbouring dirt, and I think it should be possible to avoid them, running only below the floors the necessary mains, which would be lagged. The boiler is, of course, intact, and most of the radiators can be reused.

21. ELECTRIC LIGHTING.

The type of fitting will require consideration. Some of the more recent systems of semi-indirect lighting give a better diffused light than the ordinary shaded lamps which were used before.

22. BELLS.

The cost will, of course, depend on the weight. For the purposes of my present estimate, I have assumed that the largest bell would weigh about 16 cwt. If the frame were prepared for the addition of a sixth bell in future, the cost would be about £ 35 more.

23. CLOCK

The estimates do not include the Organ or its case. The design of the case will require careful attention to suit its situation, though it may fitly be made quite simple. It should not however be left to the organ-builder.

The estimates do not include any special provision for ventilation, beyond what would be obtained by the window-casements recommended. If roof-ventilation is considered to be necessary, what are known as "concealed roof-ventilators" would be least obtrusive.

X The estimates do not include anything for the tomb in the nave, nor for the repair of the two wall-monuments.

The estimates include architect's charges, but do not include anything for the salary of a Clerk-of-works (should one be needed).

With regard to the method of carrying out the work, much of it is of such a character as to make it quite unsuitable for a lump-sum contract. I recommend, as best suiting the conditions, and as most advantageous to you from every point of view, a contract on the basis of net cost plus an agreed percentage for use of plant and scaffolding, establishment charges, and profit. In view of the exceptionally difficult character of much of the work (especially on the nave arcade and the tower), it is essential that the builder shall be thoroughly competent and especially experienced in this kind of work. I know no one who combines these qualities better than Mr. Anelay, and I recommend that a contract on cost basis be made with him for the works included under Nos. 1 to 18 above.

I am, Gentlemen,

Yours faithfully,

John Pileon.

<u>ESTIMATES OF COST.</u>		£
	Preliminary shoring, scaffolding, and clearing.....	250
	further scaffolding yet to be done.....	200
1	NAVE AND AISLES, ETC. Nave Arcade, etc.....	1,020
2	" Floors.....	575
3	" Nave Roof (timber, to sketch C or D)...	1,650
	Ditto: Add for oak..... £ 450.	
4	" Aisle Roof (timber and lead).....	800
	Ditto: Add for oak..... £ 150	
5	" Vestry Roof.....	165
6	" Windows.....	285
7	" Doors.....	62
18	" Minor Masonry repairs, allow say.....	450
8	CHANCEL. Floors.....	250
9	" Roof (outer).....	960
10	" Wood Vaulting.....	440
	Ditto: Add for oak..... £ 220	
11	" Windows.....	165
18	" Minor Masonry repairs, allow say.....	300
12	TOWER. Arch under west wall.....	275
13	" Iron Screen.....	30
14	" Arch under south wall.....	500
15	" Masonry above ground-floor.....	1,060
16	" Floors, Roof, etc.....	675
17	" Lightning Conductor.....	30
19	FITTINGS. Nave Benches (oak).....	750
	" " Alternative for Chairs..... £ 110	
	" Pulpit (oak).....	150
	Choir Stalls, Kneelers, and Altar.....	350
20	HEATING.....	180
21	ELECTRIC LIGHTING, depending on type of fitting.....	150
22	BELLS (five), frame, and fixing.....	900
23	CLOCK.....	200
		£ 12,822