

[Jan. 1930]

REPORT

TO

DR. H. W. CHASE, PRESIDENT
UNIVERSITY OF NORTH CAROLINA

ON

THE PRESENT CONDITION OF MEMORIAL HALL

AND

AS TO THE PRACTICABILITY OF ITS REPAIR

BY

JOHN H. GREGORY

PROFESSOR OF CIVIL ENGINEERING
THE JOHNS HOPKINS UNIVERSITY

DECEMBER 7, 1929

[Jan. 1930?]

December 7, 1929

Dr. H. W. Chase, President
University of North Carolina
Chapel Hill, North Carolina

Dear Sir:

You have requested me to inspect Memorial Hall at the University of North Carolina and to advise you as to the present condition of the building and as to the practicability of its repair. In accordance with your request I made a careful inspection of the building on December 5th, 1929, and beg to present the following report.

The important structural features of the building are correctly set forth in two reports, dated November 27th, 1929, one by Atwood and Nash, Architects and Engineers, and the other by Sherwood Brockwell, Fire Engineer, from the Office of the State Insurance Commissioner. These features will not be repeated here. I may say, however, that in an experience of upwards of thirty years, which has included the design and construction of various types of buildings, I know of no building of similar construction, that is, in so far as the structural features are concerned.

My inspection has included a careful examination of both the superstructure and substructure. Insofar as the superstructure is concerned the framing can be examined, as I have done personally, by crawling through and over the trussed arch construction. In doing so I have noted the condition of the different members of the trussed arches, which are of wooden framing, and especially the

[Jan. 1930?]

-2-

framing of the joints and the joints themselves. It is evident, at once, that the arches are distorted and out of line, and are overstrained. This is apparent from the fact that at many points, where the framing should be tight and the joints close fitting, the joints are open, in places open to such an extent that one can insert his fingers in the joint.

Further, marks on the members, which must have been placed when the building was constructed, indicate a certain amount of sliding of one timber on another. And still further, at points, it can be seen that movement has taken place, more or less recently, as evidenced by the fact that clean wood is exposed in contrast to the otherwise darker color of the wood. The conditions above mentioned show that the arches are not in a safe condition to carry the loads to which they are subjected.

Again, where the tie rods pass through the wooden members, the distortion has been such, in places, as to cause crushing of the fibres of the wood where the nuts and washers bear on the wood. This, again, is another sign that the arches, at such places, are overstrained.

It is not necessary, however, to examine the structure from the inside to see that the framework supporting the roof is distorted. A bulging of the roof at the south end of the westerly arch can be seen by viewing the roof from the ground at the rear of the building.

The timber in the arches over the auditorium is, in general, in a good state of preservation but such is not the case at the foot of the arches above the floor level. Here, the wooden covering has been removed, in places, so that the timber can be examined and

[Jan. 1930?]

-3-

it is found that it is in an advanced stage of decay. The decay has proceeded to such a stage that rotten wood can be easily removed by the fingers alone. Examination by a knife reveals that the dry rot proceeds inward. Such a condition is inimical to the safety of the structure.

Below the floor, in the substructure, some of the encasing brickwork has been removed, enough to reveal that here again dry rot has taken place to an alarming extent at the base of the wooden arches. Pieces of the wood, which I have removed, have so decayed that some easily break up to a powder, and others are very easily broken in two.

CONCLUSIONS

As a result of my examination of the building my conclusions may be briefly summarized as follows:

1. The building is not a safe structure.
2. In its present condition it should not be used, a precaution which you have already taken, and should be roped off, as has been done.
3. In my opinion it is not practicable to repair the structure. This is not meant to be interpreted that it would not be physically possible to carry out extensive work of reconstruction so as to preserve the exterior appearance of the building, but I do not consider it feasible to attempt to repair the wooden arches. They would have to be entirely removed, meaning, of course, the dismantling of practically the entire structure, except that some portions of the exterior brick walls

[Jan. 1938?]

-4-

might be saved. Reconstruction would call for the replacing of all the wooden arches and members by steel construction, and by the time such an extensive work of reconstruction had been completed, the cost would, in my judgment, equal, if not exceed, the cost of constructing an entirely new building of the same capacity.

Respectfully presented,

(Signed) John H. Gregory,

Professor of Civil Engineering
Johns Hopkins University