

July 12, 1927.

Julia Morgan, Architect,  
1135 Merchants Exchange Bldg.,  
San Francisco, California.

Dear Miss Morgan:

At the request of your office, I have made a detailed examination of the structural framing of that portion of the third and fourth floors of the San Francisco Y. W. C. A. Building which it is desirable to convert into an area composed of club rooms and dancing space. When floor areas are to be put to this kind of use, the San Francisco Building Law prescribes that a live load of 125# per square foot, in addition to the dead load, is to be provided for in the design of the floor system. The girders may be proportioned to carry full dead load and eighty percent of the required live load. I have made up loads to be supported by the various units of the floor frame accordingly.

Third Floor: (Area bounded by columns 42-44-52 and junction of 15" I-60# with 15" I 42#). I have assumed the 12"-31.5# I-beams connecting columns 46-47-48-49, etc., to act as girders, and, in this investigation, have submitted them to the minimum allowable loading. The resultant stresses amount to 20,000# per sq. in., while the maximum stress allowable is 18,000# per sq. in. There will be some spring or give to these girders but they will probably satisfactorily support the new loads coming on them. The 12"-31.5# I-beam



girder between columns 36 and 45 will be stressed to about twice the allowable when subjected to the new loading. This girder will have to be strengthened before it will carry any load in excess of its present load. The 12" I 31.5# wall beams are capable of sustaining the newly imposed loading.

The 2" x 12" joists at 12" centers spanning 19'-7" are wholly inadequate to support the new loading. While they will only be stressed to 1825# per sq. in., they will have a deflection ranging from  $1\frac{1}{2}$  inches to  $1\frac{1}{2}$  inches. This would result in a very springy floor when danced upon and would be quite detrimental to the plaster in the ceiling below. An adequate floor system for this span should consist of 2" x 16" joists at 12" centers. Likewise 2" x 14" joists at 12" centers should be provided to span the 15'-0" of the adjacent panels.

Fourth Floor: (Area bounded by columns 28-29-51 and 52). The framing in this floor and the superimposed loading are the same as in the floor below and the same conditions obtain. This floor can be made safe for dancing by providing larger joists as noted above or by increasing the number of joists in the present floor.

I have studied the structural plans carefully and can find no details of connections of I-beams to columns or I-beams to I-beam girders. I am assuming that all connections are made by use of standard connection angles for the I-beam which is supported and that these connections as such are