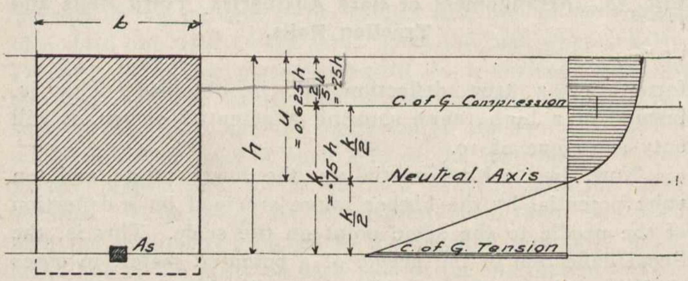
CORRESPONDENCE

[This department is a meeting-place for ideas. If you have any suggestions as to new methods or successful methods, let us hear from you. You may not be accustomed to write for publication, but do not hesitate. It is ideas we want. Your suggestion will help another. Ed.]

SAFE FLOOR LOADS.

Sir,—Referring again to the article on "Safe Superimposed Loads," published in the issue of August 21st, 1908, and Mr. Gustave Kahn's criticism thereof, the writer would say that the formula deduced and table given were made to comply with the Toronto Building By-law as published for the use of architects and others, but, as Mr Kahn pointed out, they are not according to the interpretation of that by-law made by the Building Department.



To make the matter clear it might be well to describe the method of design used by the Building Department, and give a table showing how the results of this method compare with those formerly given.

All symbols used will be the same as in the preceding article. It is assumed that the neutral axis of the beam is half-way between the centre of gravity of tensile forces and the centre of gravity of compressive forces, and that the intensity of compression in the concrete may be represented by a parabolic curve, the base of which lies on the top surface of the beam. These assumptions give the proportions shown in the accompanying diagram:—

From this we find that the economical area of steel is 0.00912 of the area of concrete, as follows (the average intensity of stress in the concrete, if considered about the c. of g. of steel, will be found to be 356. This is taken at 350, and the area inclosed in the parabola is two-thirds of the rectangle):—

Total compression = total tension;

$$\text{i.e., } 0.625\ h.b \times \frac{2}{3} \times 350 = As \times f.$$

$$146\ h.b = As \times f.$$

$$As = \frac{146\ h.b}{f}$$

$$= 0.00912\ h.b$$

When $b = 12$ inches, then $As = 0.1095\ h$.

For a beam proportioned with this area of steel we will have a resisting moment of $146\ h.b \times 0.75\ h = 109.5\ h.b$

When $b = 12$, R.M. $= 1314\ h^2$.

In a continuous floor slab maximum bending moment is considered as $\dfrac{w.l\ (12\ l)}{10}$

Resisting moment = maximum bending moment.

$$1314\ h^2 = \frac{12\ w\ l^2}{10}$$

$$w = \frac{1314\ h^2 \times 10}{12\ l^2}$$

$$= \frac{1095\ h^2}{l^2}$$

Loads given in the table equal this, less the weight of one square foot of slab. It will be noticed that this gives a much higher safe load than the formula presented before, but it is hardly necessary to point out that, although perhaps this will not result in a dangerously high load, yet the method of obtaining it does not agree with that used by any

$$w = \frac{1095h^2}{l^2} - a$$

Total Depth in Inches (h+1).	Area of Steel in Sq. In. per Ft. of Width.	Weight per Sq. Ft. of Slab (a).	SPAN IN FEET. 2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	7	8	9	10	11	12
2.5	.164	30	585		240	170	125	90									
3.0	.219	35	1060	665	450	320	240	180	140	110	90						
3.5	.274	45	1665	1050	710	510	380	290	230	180	145	95					
4.0	.328	50		1530	1045	755	565	435	345	275	225	150	105	70			
4.5	.383	55			1430	1040	785	610	480	390	320	220	155	110	80		
5.0	.438	65			1880	1365	1030	800	665	515	425	300	210	150	110	80	
5.5	.493	70				1740	1315	1025	815	665	55c	380	275	205	150	115	90
6.0	.547						1635	1275	1020	830	685	480	350	275	200	150	115
6.5	.602	80						1580	1250	1015	840	595	435	330	250	195	150
7.0	.657	90							1490	1215	1005	715	525	400	305	235	185
7.5	.710	95							1750	1435	1190	850	630	475	365	290	215
8	.766	100								1670	1390	995	740	560	435	345	275
9	.875	110									1840	1320	985	755	590	470	375
10	1.095	125										1675	1260	970	760	605	475

Total Depth in Inches (h+1).	Span in Feet. 13	14	15
6.5	115	90	
7.0	145	110	85
7.5	180	140	110
8	220	175	140
9	305	250	200
10	400	325	270