

LOADS.

Classification of Floors.—For assessing the imposed (or live) load on floors in buildings, B.S. Code (No. 3; Chapter V) and the London By-laws classify the floors according to use to which they are to be put; these classifications and the corresponding minimum imposed loads are given in Table 3. The imposed loads on garage floors are given in Table 5. **Reduction of Imposed Loads on Multiple-story Buildings.**—The scales of the reduction of imposed loads on the floors of multiple-story buildings for the design of the columns, walls, and foundations according to B.S. Code (Chapter V, 1952) and the London By-laws (1952) are given in Table 3. No reduction is to be made for factories and workshops designed for 100 lb. per square foot or less, warehouses, garages, and buildings used for storage. For factories and warehouses designed for more than 100 lb. per sq. ft., the reductions given in Table 3 apply, but the total imposed load after reduction is to be not less than 100 lb. sq. ft. per floor.

Examples.—(a) Calculate the total load on a column supporting a flat roof and ten floors, including the ground floor, of an office building. The total dead weight of the roof is 60 lb. sq. ft., and of each floor 120 lb. per sq. ft. including partitions. The story-height is 10 ft. the average size of each column is 18 in. square. Each column supports a panel of floor 10 ft. by 16 ft.

Dead load: Roof = 60 lb. per sq. ft.
 Nine upper floors 9 × 120 lb. = 1080 " " "
 Ground floor = 120 " " "

Total dead load

Roof = 1260 " " "
 Nine upper floors = 9 × 0.6 × 50 lb. = 30 " " "
 Ground floor = 0.6 × 60 lb. = 36 " " "
 = 1596 " " "

Total uniformly-distributed load

Load on column = 1596 × 20 × 16
 Weight of column = (18 × 18 × 150 ÷ 144)
 × 10 × 10 ft. = 510,720 lb.
 = 33,750 " "

Total load per column (below ground floor)

= 544,470 "

(b) Assuming that the building in Example (a) is a factory, each floor of which is designed 150 lb. per sq. ft., calculate the total load on one column.

The normal reduced load for ten floors is 0.6 × 10 × 150 lb., that is 900 lb. per sq. ft., which is less than the specified minimum load of 10 × 100 lb. = 1000 lb. per sq. ft.; the minimum load therefore applies. The total load is therefore

Dead load (as before) = 1260 lb. per sq. ft.
 Imposed load: Roof = 30 " " "
 Floors = 1000 " " "

Total uniformly-distributed load

= 2290 " " "
 Load on column = 2290 × 20 × 16 = 732,800 lb.
 Weight of column (as before) = 33,750 "

Total load on column

= 766,550 "

CLASS Nº	B. S. CODE CP. 3 (V) 1952 LONDON BY-LAWS 1952	30	40	50	60	80	100	150	200
IMPOSED LOAD (LB. PER SQ. FT.)		30	40	50	60	80	100	150	200
MINIMUM TOTAL LOAD	SLABS SPAN LESS THAN 8 FT. BEAMS SUPPORTING LESS THAN 64 SQ. FT.	240	320	400	480	640	800	TOTAL LOAD (LB.) ON BEAM.	TOTAL LOAD (LB.) ON BEAM.
TYPE	USE OF FLOOR	1920	2560	3200	3840	5120	6400		
	HOUSES: TWO STORIES (ONE OCCUPANT) OTHERS (INCLUDING FLATS) HOSPITAL WARD; DORMITORIES HOTELS: BEDROOMS; PRIVATE SITTING-ROOMS PUBLIC ROOMS	30	40	50	60	80	100		
RESIDENTIAL	OFFICES: ENTRANCE FLOOR AND BELOW OTHER FLOORS STORAGE AND FILING ROOMS	60	50	50	50	60	60		
COMMERCIAL	BANKING HALLS RETAIL SHOPS BOOK AND STATIONERY STORES WAREHOUSES (DEPENDENT ON TYPE OF GOODS)	100	100	100	100	100	100		
INDUSTRIAL	WORKSHOPS AND FACTORIES (DEPENDENT ON USE) WORKROOMS: WITH CENTRAL POWER-DRIVEN MACHINES WITHOUT DITTO OR STORAGE POWER STATIONS & MACHINERY HALLS: CIRCULATION SPACE	100, 150, 200	100, 150, 200	100, 150, 200	100, 150, 200	100, 150, 200	100, 150, 200		
PLACES OF ASSEMBLY	SCHOOL CLASSROOMS WITHOUT FIXED SEATING; DANCE HALLS WITH FIXED SEATING; CHURCHES, ETC. RESTAURANTS	60	100	80	80	80	80		
MISCELLANEOUS	PUBLIC PAVEMENTS OVER BASEMENTS CORRIDORS. — SAME IMPOSED LOAD AS FLOOR OF WHICH THEY FORM PART. BALCONIES. — SAME IMPOSED LOAD AS FLOOR OF WHICH THEY GIVE ACCESS. MINIMUM TOTAL LOAD APPLIES IF PROJECTION OF CANTILEVERED BALCONY IS LESS THAN 8 FT.	200	200	200	200	200	200		
ROOFS	SLOPE (8 DEG.) FLAT NOT STEEPER THAN 10 DEG. NOT STEEPER THAN 30 DEG. CURVED NOT STEEPER THAN 45 DEG.	IMPOSED LOAD (LB. PER SQUARE FOOT OF HORIZONTAL AREA) WITHOUT ACCESS WITH ACCESS WITHOUT ACCESS NOT STEEPER THAN 75°: 25 — 9° STEEPER THAN 75°: NIL DIVIDE INTO FOUR EQUAL SEGMENTS. — IMPOSED AND WIND LOADS ARE THOSE APPLICABLE TO THE SLOPE OF THE CHORD OF EACH SEGMENT. ROOF COVERING (EXCEPT GLASS) TO BE DESIGNED FOR A LOAD OF 200 LB. CONCENTRATED ON 5 IN. SQUARE	15 LB. 30 LB. 15 LB. 15 LB. 15 LB.	15 LB. 30 LB. 15 LB. 15 LB. 15 LB.	15 LB. 30 LB. 15 LB. 15 LB. 15 LB.	15 LB. 30 LB. 15 LB. 15 LB. 15 LB.	15 LB. 30 LB. 15 LB. 15 LB. 15 LB.	15 LB. 30 LB. 15 LB. 15 LB. 15 LB.	15 LB. 30 LB. 15 LB. 15 LB. 15 LB.
STAIRS AND LANDINGS	CLASS OF FLOOR SERVED	No. 30 No. 40, 50 OR 60 OTHER CLASSES	No. 1 No. 2, 3 OR 4 OTHER CLASSES	No. 1 No. 2, 3 OR 4 OTHER CLASSES	No. 1 No. 2, 3 OR 4 OTHER CLASSES	No. 1 No. 2, 3 OR 4 OTHER CLASSES	No. 1 No. 2, 3 OR 4 OTHER CLASSES	No. 1 No. 2, 3 OR 4 OTHER CLASSES	No. 1 No. 2, 3 OR 4 OTHER CLASSES
COLUMNS WALLS AND FOUNDATIONS	NUMBER OF FLOORS SUPPORTED PROPORTION OF IMPOSED LOAD ON ALL FLOORS SUPPORTED SEPARATE CANTILEVERED STEP	1 1-0 1-0	2 0-9 0-9	3 0-8 0-8	4 0-7 0-7	5 0-6 0-6	6 0-5 0-5	7 0-4 0-4	8 0-3 0-3
	NOT APPLICABLE TO STORES, WAREHOUSES, GARAGES, WORKSHOPS AND FACTORIES. WORKSHOPS AND FACTORIES DESIGNED FOR MORE THAN 100 LB./SQ. FT. — REDUCTION FACTORS AS ABOVE APPLY BUT IMPOSED LOAD NOT TO BE REDUCED TO LESS THAN 100 LB./SQ. FT. BEAM SUPPORTING 500 SQ. FT. OR MORE OF FLOOR. — IMPOSED LOAD MAY BE REDUCED BY 5% (MAX. REDUCTION 25%) FOR EACH 500 SQ. FT. OF FLOOR SUPPORTED.								

See also Table 4 for loads on garage floors; Table 2 for loads due to partitions; and Tables 7 and 8 for wind pressure on roofs.