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1,000 lbs per square foot for dead load only.
1,500 lbs per square foot for dead load and live
load combined.

Proposed amended Building Rule "Bending Moments."

In order to estimate the bending moments on a beam or slab, the effective span and the whole load on the effective span shall be considered.

Continuous beams shall be assumed free to rotate about their supports.

The bending moments to be provided for at every cross-section of any continuous beam or slab shall be the maximum positive and negative moments at such cross-section calculated in accordance with one or other of the following sets of conditions:-

(a) From support moments theoretically calculated:-

- (1) With alternate spans loaded and all other spans unloaded.
- (2) With adjacent spans loaded and all other spans unloaded.

Where the positive moments so obtained are less than $\frac{1}{2}$ the free moment, at least $\frac{1}{2}$ the positive free bending moment shall be provided for.

(b) From support moments arbitrarily chosen to be between $\frac{1}{7}$ and $\frac{1}{3}$ of the maximum free bending moment in a span:-

- (1) With that span loaded.
- (2) With that span unloaded, but with support moments chosen as above for adjacent loaded spans.

In all beams at least $\frac{1}{4}$ of the maximum positive reinforcement shall extend to the centre line of the supports.

No. F-13

FOUNDATION DATA

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	Year of comple- tion.	Total weight of the build- ing, fully loaded, in metric tons	Surface of contact with the soil in square meters	Load per sq. cm. in Kilo- grams
<u>1.- Lokawei Old Power Station.</u>				
Sets No 1 and 2.....	1922	2320	180.24	1.29
Set No 3.....	1924	2420	184.14	1.31
Set No 4.....	1925	2420	180.42	1.34
Set No 5.....	1927	2700	201.76	1.34
Set No 6.....	1929	2700	205.92	1.31
Set No 7.....	1931	2700	205.92	1.31
Set No 8.....	1931	2700	205.92	1.31
<u>2.- Lokawei New Power Station.</u>	1934	10200	1550	0.66
<u>3.- Tonkadou Power Station.</u>	1930	3330	518.5	0.64
<u>4.- Picard-Destelan Water Tank</u>	1928	14000	2725	0.51
<u>5.- Koukaza Water Tanks</u> (entirely underground)	1933	-7755 (negative load)	1530	0.51

Item No 1. The Lokawei Old Power Station is a building in reinforced concrete with separate foundations for each of the pillars, about the subsidence of which we have no very precise data. Inside this station are installed 7 huge concrete blocks, practically solid, on top of which are installed the Electricity generating sets of the station. The figures given refer to all of these sets (Sets 1 and 2 being built on the same foundation blocks).

Item No 2. The Lokawei New Power Station is a building which comprises:

- a) a basement made of reinforced concrete which at its bottom forms a solid unbroken floor. This basement is made to support 2 big Electricity generating sets, only one of which is at present installed;
- b) an upper structure of steel and bricks, serving to house the 2 generating sets and to support a 45-ton travelling crane.

Item No 3. The Tonkadou Power Station is constructed along lines similar to item No 2.

Item No 4. The Picard-Destelan Water Tank is a reinforced concrete tank of rectangular shape, which is almost entirely above ground level.

Item No 5. The Koukaza Water Tanks are 4 in number. The particulars given above refer to one only of these tanks. Contrary to Picard-Destelan Water Tank, the Koukaza tanks are entirely below ground. In fact they have been constructed in the French Municipal Park of Koukaza and the top of these tanks is approximately 3 feet below ground level. They have been entirely covered with earth and

		P i l e s				Total	
Specifications	Side or mean diameter in inches.	Length in feet	Total number	Num- ber per square meter.	Load per pile in Tons.	Subsi- dence in Milli- meters	
1.-	Square -	8	30	677	3.76	3.43	334
	Oregon pine						
	idem.	8	30	711	3.86	3.40	381
	Round - Foochow						
	poles.	7-1/2	28	728	4.04	3.32	553
	idem.	7-1/2	28	827	4.10	3.26	458
	idem.	7-1/2	28	851	4.13	3.17	401
	idem.	7-1/2	28	865	4.15	3.12	263
	Round - Douglas						
	fir	18	75	128	0.62	21.1	126
2.-	Round - Douglas						
	fir	16	110)		0.30	21.7	not
	Concrete head	18	10)120	469			appre- ciable
3.-	Franqui Piles	25	33	144	0.28	23.1	38
4.-	Square Oregon Pine	12	40	573			
	Round Siberian Pine	10	28	1962			
				2535	0.93	5.52	50
5.-	Armoured Vibro						
	piles	18	51	150	0.10	51.4	not ap- preciable

a grass lawn planted on the surface. This explains why, when empty, the tanks exert no pressure on the ground; on the contrary, the pressure on the sides and the bottom will tend to lift them out of the ground.

No. F-14

FOUNDATION SOIL TESTING AND SETTLEMENT MEASURING
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1.) Erection of a 70 metre Chimney Stack at the Vienna Municipal Gas Works. In front of the chamber furnace at the Vienna Municipal Gas Works a 70 metre smoke stack had to be erected, the circular foundation of which was intended to be 10 metres. The mean floor pressure computed was 1.7 kilograms per square centimetre, edge pressures from 0.5 to 2.9 kg/cm² due to wind pressure being considered. (see Blatt 1). In order to ascertain the strata a bore was made to a depth of 25 metres. The profile of the bore showed a bed layer with a 7.10 m stratum of coarse gravel and sand underneath, below which there followed layers of yellow and blue clay and clayey sand. Solid, grey clay was found at a depth of 18 metres. The bottom of the foundation was intended to be at a depth of 5.5 metres, at about the upper limit of the gravel layer. Test-loads were made at 4 different places on square pressure areas of 200 and 400 cm², the results of which are represented on Blatt 1. The settlement in dry gravel increased rather regularly with the pressures, the elastic return when pressure was removed being about 13%. A great increase of settlement was strikingly shown when the soil had been previously wetted. As the ground-water level was found close below the future floor of the foundation and variations in the level had to be taken into consideration, the author suggested to reinforce the soil by injecting cement-mortar. (see Blatt 2). When the excavation had reached a depth of 5.7 metres, a 0.5 m concrete layer was made in which the guide tubes for injecting the cement were imbedded. Altogether 34 tubes were provided, 28 equally spaced along the circumference of a circle of 9 metres diameter and 6 likewise on the circumference of a smaller circle of 3 metres in diameter. 2-inch steel tubes were driven through these guide tubes 3 metres below the foundation-floor for injecting the cement-mortar. The tubes had steel points at their bottom ends and were provided with holes to a height of 3 metres. Pure cement mortar was injected under a pressure of 4 atmospheres. The quantity of cement injected through the individual tubes can be seen from the table on sheet 2. Altogether 7500 kgs of cement were injected. The tubes were left in position, as it did not pay to regain them (old boiler tubes). When the injection was finished, a concrete foundation slab of 2 metres thickness was poured in which 4 depth gauges were inserted to observe the settlement. (see Blatt 3). As the erection of the stack progressed, as well as some time after its completion, exact measurements of the settling were taken, the results of which are found in the table on Blatt 4. These measurements were obtained by means of a levelling instrument permitting very exact reading and related to a fixed point at an adequate distance. The diagrams on Blatt 5 show the increase of settlement under growing pressure, representing also the relation of time. It will be seen from the resulting pictures that the settling lines asymptotically approach a maximum of 5.9 millimetres, the settling-measurements having been started from a preceding