

ton, Mass., and by study of the detailed data of about 90 actual tile drains and pipe sewers, part sound and part cracked.

It is recommended that for clay and all common material except sand and loam, the values under clay be used, and for sand and loam, the values under sand.

Strength of Tile Required.—6. It is recommended that where tile are to be laid according to the description for the Ordinary method, a factor of safety of $1\frac{1}{2}$, applied to the average strength, shall be used when the results of the tests are reported in terms of the ordinary supporting strength, calculated as prescribed in Section 8 of the proposed Standard Specifications for Strength

Tests of Drain Tile, and loads estimated according to Table I.

7. Where the tile are to be laid in accordance with the method denominated First-Class, in consideration of the increased support furnished by the improved foundations, the nominal factor of safety to be employed shall be $1\frac{1}{4}$, applied to the average strength, and with loads estimated according to Table I.

8. In this case it is intended that the concrete-cradles shall furnish the strength necessary to carry the load from the ditch filling. It is recommended, however, that only Class No. 1 A or Class No. 1 Extra A tile shall be used in this case.

Table I.—Maximum Loads on Drain Tile and Sewer Pipe from Ordinary Ditch-Filling Materials—Ordinary Sand, 120 lb. per Cu. Ft.; Thoroughly Wet Clay, 120 lb. per Cu. Ft.
Loads in Pounds per Linear Foot.

Height of fill above top of tile, ft.	Breadth of Ditch a Little Below Top of Tile											
	1 ft.		2 ft.		3 ft.		4 ft.		5 ft.			
	Sand.	Clay.	Sand.	Clay.	Sand.	Clay.	Sand.	Clay.	Sand.	Clay.	Sand.	Clay.
2	180	190	410	420	650	660	890	900	1,110	1,130		
4	270	300	710	750	1,170	1,220	1,640	1,690	2,100	2,150		
6	310	360	910	1,000	1,590	1,680	2,270	2,400	2,970	3,100		
8	340	400	1,070	1,190	1,910	2,070	2,820	3,000	3,720	3,930		
10	350	420	1,180	1,330	2,180	2,400	3,260	3,510	4,380	4,680		
12	360	440	1,250	1,440	2,400	2,670	3,650	3,990	4,980	5,340		
14	360	440	1,310	1,530	2,570	2,890	3,990	4,380	5,490	5,940		
16	360	450	1,350	1,600	2,710	3,090	4,260	4,740	5,940	6,480		
18	360	450	1,380	1,650	2,820	3,250	4,490	5,050	6,330	6,930		
20	360	450	1,400	1,690	2,910	3,390	4,700	5,340	6,660	7,410		
22	360	450	1,420	1,720	2,980	3,510	4,880	5,570	6,960	7,800		
24	360	450	1,430	1,740	3,050	3,600	5,010	5,780	7,230	8,160		
26	360	450	1,440	1,760	3,090	3,680	5,150	5,970	7,460	8,490		
28	360	450	1,440	1,780	3,120	3,750	5,240	6,120	7,670	8,760		
30	360	450	1,440	1,790	3,150	3,800	5,340	6,280	7,830	9,030		
Infinity	360	450	1,450	1,820	3,270	4,090	5,820	7,280	9,090	11,370		

PROPOSED STANDARD ROAD TERMS.

BY the Committee on Standard Tests for Road Materials, appointed by the American Society for Testing Materials, the following terms applicable to materials for roads and pavements were submitted at the recent convention of the society as proposed standard definitions:

Asphalts.—Solid or semi-solid native bitumens, solid or semi-solid bitumens obtained by refining petroleum, or solid or semi-solid bitumens which are combinations of the bitumens mentioned with petroleum or derivatives thereof, which melt upon the application of heat and which consist of a mixture of hydrocarbons and their derivatives of complex structure, largely cyclic and bridge compounds.

Asphaltenes.—The components of the bitumen in petroleum, petroleum products, malthas, asphalt cements and solid native bitumens, which are soluble in carbon disulphide but insoluble in paraffin naphthas.

Blown Petroleum.—Semi-solid or solid products produced primarily by the action of air upon originally fluid native bitumens which are heated during the blowing process.

Carbenes.—The components of the bitumen in petroleum, petroleum products, malthas, asphalt cements and solid native bitumens, which are soluble in carbon disulphide but insoluble in carbon tetrachloride.

Cut-back Products.—Petroleum or tar residuums which have been fluxed with distillates.

Tars.—Bitumens which yield pitches upon fractional distillation and which are produced as distillates by the destructive distillation of bitumens, pyrobitumens or organic materials.

Coal Tar.—The mixture of hydrocarbon distillates, mostly unsaturated ring compounds, produced in the destructive distillation of coal.

Coke-oven Tar.—Coal tar produced in by-product coke ovens in the manufacture of coke from bituminous coal.

Dehydrated Tars.—Tars from which all water has been removed.

Gas-house Coal Tar.—Coal tar produced in gas-house retorts in the manufacture of illuminating gas from bituminous coal.

Oil-gas Tars.—Tars produced by cracking oil vapors at high temperatures in the manufacture of oil gas.

Pitches.—Solid residues produced in the evaporation or distillation of bitumens, the term being usually applied to residues obtained from tars.

Refined Tar.—Tar freed from water by evaporation or distillation which is continued until the residue is of desired consistency; or a product produced by fluxing tar residuum with tar distillate.

Water-gas Tars.—Tars produced by cracking oil vapors at high temperatures in the manufacture of carburetted water-gas.