

GUTTER CONSTRUCTION FOR STREETS AND ROADS.*

By T. Hugh Boorman, C.E.

HIGHWAY engineers and road specialists have always agreed that the pre-requisite for a good pavement is proper drainage and a substantial foundation for the wearing surface, and it is now generally conceded that we must have a waterproof surfacing even for country roads.

On a building's roof, we must pay the greatest attention to the gutter and afford the best method possible for the carrying off of the rain water to the outlets as ef-

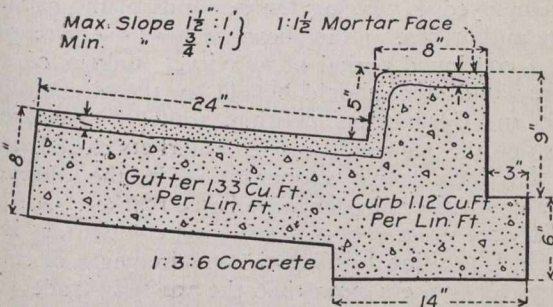


Fig. 1.—Standard Type of Combined Curb and Gutter.

ficiently and speedily as possible. Given the fact that we are to roof our roads with waterproofing material, does it not follow that we should apply similar precautions for road roofs?

In the June 10, 1914, issue of "Engineering and Contracting" is given the construction of concrete curb and gutter as adopted in Washington by the District Commissioners, under the supervision of Captain Mark Brooke, Engineer Corps, U.S.A.:

"Concrete Curb and Gutter.—In Fig. 1 is shown the standard type of combined curb and gutter in general use. It will be noted that the curb is unusually thick and the base therefor is quite broad. The method employed in laying is as follows:

"A trench is excavated and trimmed to a depth of at least 14 inches and a bed of bank gravel, free from ex-

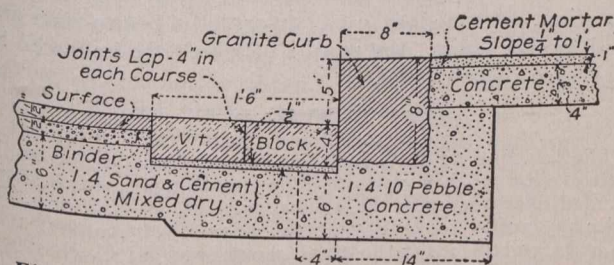


Fig. 2.—Granite Curb and Vitrified Brick Gutter.

cess clay or loam, spread to a depth of 6 inches and rammed. In making the curb, forms are placed and the mortar face formed by plastering on the inside before the curb concrete is laid. Curb and gutter is divided in 10-foot lengths, a clean cut joint being made either by use of a thin metal plate or with heavy paper. The face forms on the curb are removed within 24 hours and the surface troweled to a neat finish.

"The specifications call for a high quality of sand and no stone over 2 inches in diameter. The mortar sur-

face on gutters is placed immediately after laying concrete and thoroughly manipulated by troweling and beating with wooden battens so as to break any air cells and make the surfacing solid. Joints are filled with sand. A coating of dry cement and fine sand, 1:1 mix, containing thoroughly incorporated coloring matter, is floated on the surface. A jointing tool is used, cutting to a depth of 1/2 inch, and the exposed surface covered with sand for protection.

"Granite Curb and Brick Gutters.—The granite curb and vitrified block gutter is, shown in Fig. 2. Granite curb is set in the following manner:

"A trench is excavated 18 inches wide and 15 inches below the top of the curb when set. One edge of this trench is 4 inches beyond the finished curb line toward the centre of the street. Five inches of 1:4:10 pebble concrete is placed in this trench and the curb set immediately, heavy mauls being used to bed it firmly. As soon as the curb is laid the trench on the sidewalk side is filled to within 5 inches of the top of the curb with concrete tamped in place. Excess concrete in front of the curb which will interfere with laying vitrified block gutters is removed and earth filled in behind the curb to prevent too rapid drying out of the concrete. No provision is made for longitudinal joints between the curb and the street surface base.

"In laying the gutter as soon as practicable after the concrete base has been laid, a dry mixture of sand and cement is spread to a thickness of not less than 1/2 inch as a bed for the paving blocks. The blocks are laid on edge joints, being broken so that each block has at least a 4-inch lap in every course. A plank is laid over several courses and a rammer used until the blocks reach a firm bed and present a uniform surface. After ramming, the gutter is grouted with a thin, easy flowing grout of neat cement."

On examination of the concrete gutter on the Chevy Chase experimental road sections in Washington and Maryland last month, I found several cracks, and venture the opinion that a prepared asphalt joint applied across the work every 25 feet would obviate this trouble at a very trifling expense. The work referred to, however, is in connection with broad avenues and streets having no business traffic; and what I wish to emphasize is the fact that in our city streets particularly our construction of gutters is generally poor, from the fact that stone blocks are used transversely, instead of longitudinally.

In England the gutters are laid longitudinally generally in the case of stone or wood blocks, with the inner two lines depressed about half an inch, so forming a natural curved gutter.

I have seen asphalt blocks on roads at Irvington, N.Y., so laid, and on the approaches to the North Philadelphia Depot of the Pennsylvania Railroad brick has been set in this way; on one side of the depot twelve courses of brick and on the other eight courses.

I contend that in all cases where other than a monolithic sheet pavement is used, the gutter should be paved with blocks, longitudinally laid, and with a natural curve. While realizing that innumerable varying surfaces, requiring different construction of gutters, call for exceptional work, I am submitting the following suggestions for consideration:

When practicable, all avenues and broad thoroughfares, other than in business sections, should have a Portland cement concrete curb and gutter, preferably strengthened and made more thoroughly waterproof by the addition of some of the improved dry or liquid compounds.

*From a paper read before the American Society of Engineers, Architects and Constructors, July 4, 1914.