

METHOD OF REPAIRING WET ARCHES AND ABUTMENTS.

In a recent number of the Centralblatt der Bauverwaltung was an account of a very satisfactory method of repairing damp tunnel arches, employed on the Trier division of the Prussian State Railways, by Herr Blum, the author of the article, from which we make the following abstract.

The plan of the work was very simple, being merely the injection of cement through cracks and holes in the masonry, which became practically a monolithic mass as soon as the cement had hardened. This method of drying a tunnel was never employed until a careful examination of the surface of the ground had been made, and it was found impossible to remedy the faults by draining.

Where drainage will not suffice, the tunnel walls are carefully examined, and all joints not tight are scraped out to a depth of 2 ins. and calked with about four-fifths of an inch of oakum, and the remaining void filled with cement in the usual manner.

At the same time that this work is being done workmen are boring the 1 1/2 in. holes through the masonry into which the current is to be injected. This cement is intended to fill not only the outer parts of the joints, but also to cover the whole exterior of the masonry if there are air spaces about it. As the work of boring these holes is expensive, care should be taken that they are driven at the most advantageous points. Experience has shown that a distance of 3 ft. between the holes is as great as is consistent with good results; in very wet places this should be reduced by a third.

Whether the holes are best driven through the stone or in the joints depends entirely upon the nature of the arch, especially the character of the stone, and must be determined independently for each case. Where soft stone is employed, it is generally better to drill through the voussoirs, especially if their faces were not dressed flat, since the holes through the joints will be very rough and uneven in such cases, and the additional labor in injecting the cement will more than counterbalance the light saving in boring.

The semi-fluid cement that is forced into the crevices is composed of 5 parts of cement and 4 of water. The pump barrels are of brass and the nozzle at the end of the rubber pipe is copper. The price of the apparatus with ten feet of 2-inch rubber pipe was about \$41. With a wooden tub the cost would be considerably less. The cement must be carefully stirred, and it is necessary to clean the pumps thoroughly at least once every day.

The cement is injected at the crown first by thrusting the copper nozzle through the oakum calking and pumping until the material shows in a neighboring hole or joint; whenever the cement appears in the joints, the openings are carefully plugged, the pumps stopped and moved to the next hole. The work is usually done by means of scaffolding mounted on wheels running on the track in the tunnel.

As soon as the crown has been made impervious, the sides of the tunnel become damp. This is best remedied by breaking small openings through the tunnel sides and making, if possible, small drains filled with stone up toward the crown on the outside of the masonry.

The cost of the work varies greatly with the condition of the tunnel, as may be seen from the following figures.

The Heinzkyller tunnel is constructed of sandstone masonry, and was very wet for years. The interior was rendered dry by injecting cement over 2,425 sq. yds. of tunnel surface at a cost of \$2.45 per sq. yd. This sum includes the cost of constructing drains. In the Mettericher tunnel the cost of the work, not yet completed, has averaged \$3.13 per sq. yd. In the Looskyller tunnel, 4,656 sq. yds. were improved at \$1.56 per sq. yd. In the Nitteler tunnel, 2,830 sq. yds. were made dry at a cost of \$2.87 per sq. ft.

A very handsome effect is obtained in walls intended to be decorated by mixing an equal quantity of marble dust with the lime used in making the plaster. This gives a softness of tint which cannot be obtained with ordinary plaster. In Italy it has long been the custom to give a final coating of marble dust to walls intended to be treated by the wet process.

M. R. Notre Dame Street Montreal, October 14, 1890

C. H. Mortimer Esq. Canadian Architect & Builder and Contract Record.

Dear Sir,

I have to inform you that the following resolution was unanimously adopted at the First Annual Meeting of the Province of Quebec Association of Architects held in Montreal on 10th & 11th inst.:-

We the Architects of the Province of Quebec now assembled in convention being satisfied that the Canadian Contract Record affords us a direct communication with the contractor. Resolved: That we pledge our support to it by using its columns when calling for tenders. Yours truly C. Bluff Secretary

Prices of Building Materials.

LUMBER.

Table listing prices for various types of lumber including clear picks, three uppers, mill run, dressing, common, spruce culls, maple culls, and shingles.

Table listing prices for various types of mill cull boards, shipping cull boards, and hemlock cantling.

Table listing prices for various types of flooring, including dressed, rough, and red oak.

Table listing prices for Common Walling, Good Facing, and Sewer.

Table listing prices for various types of pressed brick, including plain, hard building, and moulded.

Table listing prices for various types of stone, including common rubble and foundation blocks.

Table listing prices for various types of slate, including roofing and terra cotta.

Table listing prices for various types of paint, including white lead, zinc, and red lead.

Table listing prices for various types of cement and lime, including white, plaster, and hair.

Table listing prices for various types of hardware, including American and Canadian pattern nails.

Table listing prices for various types of finishing nails and steel nails.