

when laid out, will have a good footing all around, on the pilaster. For this purpose the latter was designed 14 all around larger than the neat work.

The noses of the pilasters were brought into shape gradually in the top 3 courses, so as to give good bond with the neat work.

Rip rap was placed around the piers after completion, as shown on Plate XI, consisting of 1 and 2 man stones, taking a natural slope, and also of smaller stones placed carefully between the caisson and masonry during the sinking of the crib. All this might have been done without possibly by a poorer corporation, as there is very little current at low water, but under a 5 or 10 foot raise, the current is very swift, and the precaution was considered worth the money (\$4,652.50).

The cut waters were plain 45° at one end only, add might possibly have been improved by being put at the downstream end also, to avoid eddy; but this is not appreciable under ordinary water, which is slack, and the eddy only occurs during raises in the river. These noses are left rock-faced, as it was thought, to look more massive, and to answer the purpose fully as well, as their duties are only to split *soft* ice and divide up jams of logs.

The masonry is all first class, except the backing of the abutments, which is of very heavy superior rubble, and was built under the following general specification of the Baltimore & Ohio R.R. Co.:

"This class of masonry will be ranged rock work of the best description; the face stones will be accurately squared, jointed and bedded, and laid in courses not less than 12 inches in thickness, decreasing from bottom to top of the walls; joints to be well broken, no break less than 9 inches.

"The stretchers to average at least three and a half feet in length, and none to be less than three feet in length, to have at least sixteen inches bed for all courses of from 12 in. to 16 in. rise, and for all thicker courses, at least as much bed as rise.

"The headers to have a width of not less than eighteen inches, and to hold the size back into the heart of the wall that they shew in its face. They shall occupy at least one-fifth of the whole face of the wall, and be, as nearly as practicable, evenly distributed over it, and so that the headers in each course shall divide equally, or nearly so, the spaces between the headers in the course directly below. When the walls do not exceed 3½ feet in thickness, the headers shall run entirely through, and when they exceed that thickness, there shall be as many headers of the same size in the rear as in the front of the wall.

"In walls over three and a half feet, and not over six feet in thickness, the front and back headers must alternate and interlock, at least 12 inches with each other; and in walls over six feet thick, the headers shall be at least 3½ feet long, and alternate front and back, as above described, their binding effect being carried through the wall by intermediate stones, not less in length and size than the headers of the same course, laid crosswise in the interior of the work. The stretchers in the rear of the wall and the stones in the heart of the wall shall be of the same general dimensions and proportions as the face-stones, with equally good bed and bond, but with less attention to nice vertical joints, and must be well fitted to their places, and carry the course evenly quite through the wall. Any small interstices that may remain in the heart of the wall will be carefully filled with small sound stones or chips. The face-stones shall be left rough on the face, except a square or bevelled draft of one and a half inches around each stone may be required—no projection of more than three inches from the draft being, however, allowed."

To this were added the further requirements that all vertical joints be dressed back true for 12 inches from the face, and that no header should break over a joint, the masonry was all laid in full mortar (except the copings which were grouted), and has drafts, at all vertical angles, 2 inches wide, the only portions of the face that have addi-