the most laborious; the first span of the tubular bridge has already been taken away and it may therefore be said that that portion of the new structure is now in active use. The cutting of the rivets of the old structure and the removal of the various plates, girders, etc., entails an immense amount of labor, and it is of such a nature, and the field for operation is so limited, that the greatest care and caution have to be exercised in this particular part of the work, more especially on account of the incessant traffic moving in either direction.

VICTORIA JUBILEE BRIDGE, MONTREAL, SHOWING OLD TUBE SURROUNDED BY NEW STRUCTURE.

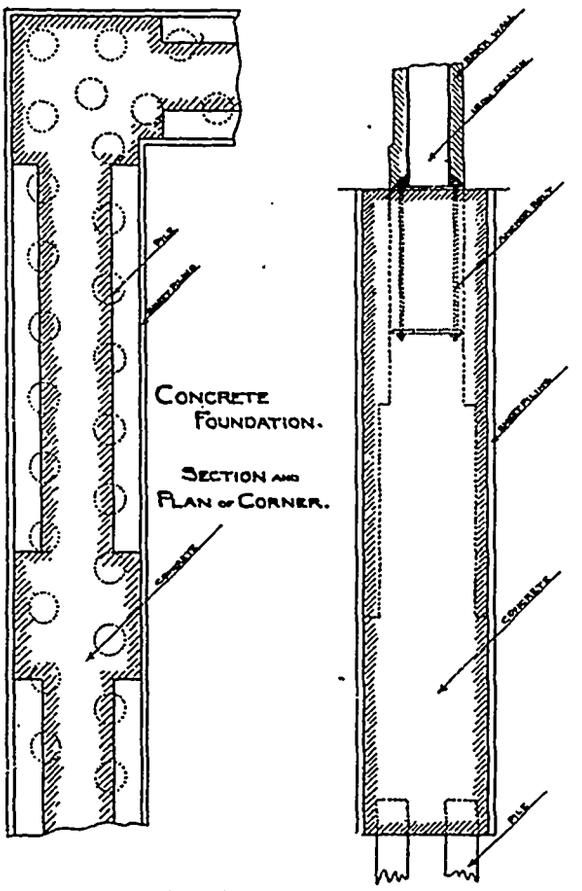
The old tubular bridge, as is well known, is a single-track structure, with a minimum clearance in height of only 15 feet. The new bridge will have a double line of railway tracks and a clear headway of 22 feet 6 inches. It will also have a team roadway and sidewalk on either side of the bridge outside the main trusses, which will be carried by the floor beams extended beyond the trusses. The total length of these floor beams is 66 feet. By way of comparison it may be interesting to note that the weight of iron-work in the old structure is 9,044 tons, whilst the new contains 22,000 tons of steel. Amongst other work yet remaining to be done is the widening of the embankment approach to accommodate the team traffic, but that is a minor matter, and will not interfere during its construction with the train traffic, nor yet with the bridge itself.

A CONCRETE FOUNDATION.

A somewhat unusual foundation has just been built for a new generating house the Consumers Gas Co. is erecting on Parliament street, Toronto. We believe it is the first of the kind in Canada. The building is to replace one that had to be torn down on account of the numerous cracks and settlements developed by faulty foundations. The foundations for this heavy building were simply rubble stone walls in lime mortar, walls that were built without any through bonders, plenty of "shiners," straight joints, parts laid up dry and all small stones; consistently with such work the walls were largely built on a soft made up bottom, one wall was carried down indeed sixteen feet below the ground level as if in search of hard bottom, which not only caused useless expense in the first instance, but also made the expenditure greater in the new work. Had piles been driven from four or five feet below the surface all round the building until they either gave an equal frictional resistance or reached hard pan, the first building would have cost less than it did and still be standing. This is a glaring instance of the greater costliness of rule of thumb methods in building over more scientific ones.

When the old foundations were removed the architects had test piles driven at intervals of about ten feet along the trenches and found the bottom to be so soft that the piles sunk to rock without practically developing any frictional resistance. Calculations were made therefore on the basis of the piles acting in direct compression, and from data thus gained it was determined to drive a double row of piles in the trenches at two feet centres staggered. These piles averaged a depth of about twenty-six feet from the ground level. They were cut off perfectly level twelve inches above the bottom of the trench and concrete filled in between to an even surface with the tops of piles, this thoroughly keyed the piles together and gave a good bed to build on.

On the recommendation of the architects, Bond & Smith, Toronto, solid concrete walls were then built to the ground level, part being sixteen feet deep. With walls such as this the loads from the superstructure (a steel skeleton building) are quite evenly distributed on the piles; Another point is that the column bolts are bedded right in the concrete mass and the whole is cohesive and rigid. The walls were stepped up in thickness from 3 feet 6 inches to 2 feet 3 inches.



The method of mixing and laying may be of interest: The concrete was formed of five parts of small broken stone, two of gravel and one of cement. After carefully examining tests of various cements a Canadian brand was specified by the architects, the Samson brand of the Owen Sound Portland Cement Co. All proportions were carefully measured in barrows of equal capacity, the stone was thoroughly wetted before being mixed with the other materials, the mixture was turned over four times to ensure thorough covering of the stone, only enough water was allowed to be added to make the mass cohesive, it was