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TOWER STREET ARCH BRIDGE AT FERGUS

By A. W. CONNOR*

We illustrate in this article a reinforced concrete arch bridge over the Grand River, recently completed at Fergus, Ont., for the county of Wellington. The bridge proper has a length of 100 feet and clear span of 80 feet. There is a clear roadway of 16 feet and two 4-foot 6-inch sidewalks, carried on brackets at each side. It is a bridge of the openspandrel type, carried on two ribs, resting on which are subsidiary spandrel arches, columns, floor beams and slabs. The open spandrel arches are purely ornamental. Fig. 3 shows an elevation and Fig. 4 a cross-section which indicates

how the structure is built up from the supporting ribs.

The site is well adapted for this type of structure, the abutments being on a rocky ledge on the banks of the Grand River. This ledge of rock is about 16 feet above the low-water level and about 20 feet below the road level. The rock is limestone. The concrete structure is considered to be in harmony with the scenery.

The old structure was a steel deck pin-connected bridge



Fig. 1 .- Showing Superstructure of Bridge.

bridge of 75 feet span, centre to centre, resting on stone abutments, built on the same ledge. As the photograph nents of the new bridge have been carried further back to avoid future undermining, and the arch design was favored hold up the structure, even if partly undermined. The faces of the abutments were set about five feet clear of the erosions. Some of the projecting portions of the rock were

*The firm of Bowman & Connor, Consulting Engineers, Toronto and

level of the crown of the roadway, which was cambered 8¹/₂ inches at the middle of the span. Care was required to get the floor beams and the circular openings in the spandrels at the proper levels. These circles were formed with sheet iron. The panel points on the ribs were finished approximately horizontal, and reinforcing rods set in to receive the columns, which were 12 inches by 48 inches wide.

All the columns were then built to the level of the floor beams. The beams and floor slab were then built together and the floor finish (a 1:2 mortar) applied as the work progressed from either end. The steel for the cantilever brackets was left projecting. There brackets were next built up to the underside of the sidewalk slab. The curb, sidewalk and

getting in the foundations, were blasted off. The rock thus thrown into the stream formed a convenient means of reducing the depth of the water for setting of falseworks. The old stone east abutment, which was in poor condition, was also taken down and thrown into the river, the ends of the steel bridge being supported by a temporary wooden bent. The new west abutment was in front of the old and was carried partly below it.

The abutments were built larger than shown on the plan, being flared out to give a larger bearing on the rock.

The falseworks were then erected in the bed of the stream. On account of the height of the work the contractor took the precaution to build a working platform under the old bridge. The old structure was then taken down with a gin pole, and short bents on top of this carried the centering.

The forms for spandrels and columns were then set up. The alignment was kept by stretching two copper wires in the line of the spandrels and at the was combared SU