

**ITEMIZED COST OF HAND-MIXED CONCRETE WORK.**

Mr. Fred R. Charles, city engineer of Richmond, Ind., has compiled the following notes concerning the cost of five pieces of hand-mixed concrete work done by day labor under his charge as engineer and superintendent of construction.

The first work was the construction of an abutment and six river piers for a bridge over the Miami River at Fernald, Ont. The piers were put down with cofferdams. Sand and stone were secured close to the site, but the cement had to be teamed 10 miles. The concrete amounted to 1,542 cu. yd., and cost \$6.30 a yard, made up as follows: Cement at \$2.10 per barrel, \$1.58; sand, 35 cents; stone, 75 cents; lumber, 64 cents; tools, 20 cents; total for materials, \$3.52; pumping, 15 cents; labor at \$1.75, \$2.78.

The second work was the construction of two abutments, measuring 434 cu. yd., for the Ernst street viaduct in Cincinnati. The cost per cu. yd. was \$6.08, itemized as follows: Cement, at \$1.70, \$1.48; sand, 64 cents; stone, \$1; lumber, 40 cents; tools, 6 cents; total for materials, \$3.58; excavating in rock and shale, \$1.12; mixing and placing concrete, \$1.13; building forms, 25 cents. Labor was paid \$1.75 a day.

The third work was the construction of 570 cu. yd. of concrete in the pedestals of the Quebec avenue viaduct at Cincinnati. These measured 5 ft. square on top and were from 8 to 20 ft. high. Their location was very inconvenient for the delivery of materials, which was wholly team and wheelbarrow work. The total cost was \$7.16 per cu. yd., itemized as follows: Cement, at \$1.60 a barrel, \$1.40; sand, 53 cents; stone, \$1.84; lumber, 38 cents; tools, 5 cents; total for

materials, \$4.20; labor at \$1.75 a day, \$2.96.

The fourth work was a pier, two abutments and some pedestals for a railroad viaduct in Cincinnati. The pier was 56 ft. high and a steam derrick was used in handling the concrete for it. On the remainder of the work all materials were teamed or wheeled. The total amount of concrete was 2,111 cu. yd., and its cost was \$7.23 per cu. yd., itemized as follows: Cement, at \$1.60, \$1.44; sand, 50 cents; stone, \$1.03; lumber, 54 cents; tools, 25 cents; water, 3 cents;

total for materials, \$3.79; labor at \$1.75 a day, \$3.44.

The last work was a reinforced concrete dam across the White-water river at Richmond, Ind. It measured 220 cubic yards. The footings were put in with the help of cofferdams and steam pumps. The cost was \$5.58, itemized as follows: Cement at \$1.60, \$1.485; sand and gravel, 80 cents; lumber, 60.8 cents; tools, 44.5 cents; total for materials, \$3.338; clearing and excavating, 96 cents; setting forms and mixing concrete, \$1.007; pumping 27.5 cents.

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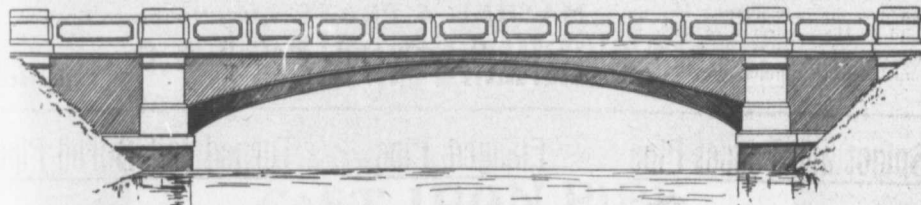
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