After treating the finer residue with a 20% solution of sulphuric acid, it was found to contain 6% of soluble matter, which was eliminated by thorough washing, and a mixture of one part cement, two parts sand, and four parts of gravel, varying from the size of a pea to 3 inches was obtained. As the sand was not of the best quality, the use of 1-2-4 mixture was ordered in shafts of pedestals, since they have to sustain a high concentrated load on a comparatively small volume of concrete. The concrete used in the buried pier and foundations was a 1-3-5 mixture. In obtaining a proper facing mixture the coarser material was kept away from the forms by the use of perforated spades, pushed down and drawn back while the mixture was still plastic. This method was found more satisfactory than that of attempting to bond a facing mixture into the body as required in some specifications.

Cement.—The following description of the method adopted for sampling and testing the cement used on all structures under construction on the Transcontinental Railway may be of interest.

The cement specifications are standard and the governing tests are for fineness, specific gravity, soundness, time of setting, and tensile strength. The cement shall not acquire its initial set in less than 45 minutes and must have acquired its final set within 10 hours, the briquettes being kept in a damp closet for 24 hours and afterwards immersed in water until time of breaking.

Sampling.—It is the writer's practice on receiving notice that a consignment of cement is to be shipped to a contractor to send an inspector to the mills to draw samples from the bags as they are being loaded into the cars; one bag in forty is sampled, both doors of the car sealed with the N.T.R. lead seal and the sample cases forwarded to the cement testing laboratory in Ottawa, in charge of a Chief Cement Inspector attached to the Bridge Engineer's Office. The seal being intact on arriving at the bridge site is a notice to the field inspector that the car has been sampled by the Bridge Department. The preliminary tests for soundness are made at once, the mills are notified to hold the cars if these results appear doubtful, and the final record covering the full 28 days tests is generally completed and the contractor advised of the acceptance soon after the cars are on the work. In mills where the records have been continuously good, the contractor has been permitted to use the cement on completion of the seven days test, in some cases where work would be held up for want of cars, but always at the contractor's risk and subject to the twenty-eight days tests; in no case where this has been allowed has the result proved a mistake in judgment. A cement sampling record slip is enclosed in the sealed sample case giving all information as to shipment. Copies of the final test record are furnished to the District Engineer as well as to the mills for comparison with the manufacturer's tests, and the