

about 60 feet from the edge of the falls and terminating in a substantial concrete abutment on the east side of the stream.

The power house foundations and wheel pit are built of rubble masonry laid in cement mortar and arched with 1-2-5 concrete over the tail-race.

It is not the object in this paper to give more than an outline of the style of works being carried out where the following experiments were made, and a full detail description of this undertaking will be presented in a subsequent article.

The bulk of the cement which was used in these works was imported Portland cement, known as "Hemmoor brand," and was made in Hanover, Germany.

These tests on cement were carried out under the supervision of Mr. C. H. Hollingsworth, C.E., who was at that time the Engineer in charge; also the moulding of the concrete cubes referred to in the following pages.

The specifications under which all the cement was furnished for these works were as follows:—

Cement:—All cement used throughout the work shall be Portland cement ground to such a degree of fineness, that not more than 10 per cent. residue shall remain on a standard 100 x 100 sieve (10,000 meshes to the square inch.)

Specific Gravity:—Specific gravity of cement shall not be less than 3.10.

Soundness:—To be determined by Falja's method. A thin pat of neat cement will be carefully made on a sheet of ground glass, 4" x 4". The pat will be bevelled from centre to edges, where it shall not be more than $\frac{1}{2}$ " thick. Immediately after making, pats are to be supported above the surface of water at a temperature of 115° Fah. in a closed vessel for six hours. At the expiration of this time they will be immersed in the water, which will be kept at the same temperature, for an additional twenty-four hours. Separation of pats from the glass, cracking or presence of blow holes, etc., will be taken as indications of unsoundness.

Tensile Strength:—Samples taken indiscriminately from the centre of cement barrels or bags, shall be mixed with 20 per cent. of water and rammed into briquette moulds, with a pressure of 20 lbs. to the square inch. After being removed from the moulds the briquettes must have a tensile breaking strength of not less than the following:—

At the end of 7 days (1 day in air, 6 days in water), 400 lbs.
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Mortar mixtures of three parts of sand Standard i.e., of such coarseness as to all pass the meshes of a 20 mesh sieve; 400 meshes per square inch, and all be retained on the meshes of a 30 mesh sieve, 900 meshes per square inch, to one part of cement with suf-