TR14_210_211

R.603. Crushing and grinding tests on sand for the Gordon Dam

The crushed sand for use at the Gordon Dam will be sized in a wet sand classifier to comply with specification. Trial crushings made by the Hydro-Electric Commission have indicated a surplus of — 3/16 inch + 14 mesh material and a deficiency of — 25 mesh + 52 mesh material in the crusher run product.

Consideration is being given to milling the surplus — 3/16 inch + 14 mesh product to finer sizes and reintroduction of the product to the classifier.

Three samples of material were submitted for roll crushing and rod mill grinding tests to examine the likely breakdown of the material. The samples were delivered by M. Jones and A. Gall, officers of the Commission who observed and assisted with the tests.

At a later date a fourth sample was submited to further extend the rod mill grinding tests.

SAMPLES

The samples submitted were described as follows:

692157 'Crushed, washed quartzite ex Hadfield portable crusher, — 3/16″ + 7 mesh'.

692158 'Crushed, washed quartzite ex Hadfield portable crusher, — 2/16″ + 14 mesh'.

692159 'Crushed, washed quartzite ex Hadfield portable crusher, —3/16″ + 25 mesh'.

692267 Equal weight composite of No. 7 and No. 14 quartzite.

ROLL CRUSHING TESTS

These tests were carried out on Denver Laboratory crushing rolls, 10-inch diameter x 6-inch face operating at approximately 250 rpm.

Tests were performed at two settings:

Setting 1: gap 0.03 inch
Setting 2: gap 0.02 inch.

Average sizings of the roll crushed products are tabulated.

ROD MILL GRINDING

These tests were carried out in a 12-inch x 36-inch Denver rod-tube mill operating at approximately 60 rpm.

Three different sets of conditions were employed:

(1) Closed circuit milling through a 25 mesh screen. Rod load 310 lb. Feed rate 8 lb/min. Circulating load: not established.
(2) Closed circuit milling through a 14 mesh screen. Rod load 159 lb. Feed rate 7 lb/min. Circulating load: 100% of new feed.
(3) Open circuit milling. Rod load 159 lb;
   (*a*) at feed 7 lb/min;
   (*b*) at feed 2 lb/min.

All wet grinding was done at approximately 65% solids.

Conditions (2) and (3) were used on the sample last received (692267) a composite of No. 7 and No. 14 sand, when it was found that condition (1) was making too fine a product.

Average sizings of the various rod milling tests are shown in the tabulated results.

RESULTS OF SIZINGS OF GROUND PRODUCT

B.S.S. mesh size	% Weight Sizing number					
	1	2	3	4	5	6
+ 7	2.3	0.3	—	—	0.2	—
+ 14	18.0	6.4	—	2.5	11.1	0.2
+ 25	31.4	24.0	1.2	44.3	33.1	0.4
+ 52	15.2	22.9	27.4	20.2	20.4	10.4
+ 100	10.5	14.2	20.5	7.8	10.0	28.0
+ 200	9.7	13.2	19.4	7.4	9.4	26.2
— 200	12.9	19.0	31.5	17.8	15.8	34.8
Composite	100.0	100.0	100.0	100.0	100.0	100.0

DESCRIPTION OF SIZED SAMPLES

Sizing
No. 1: Average of all sizings from roll crushing at setting 1.
No. 2: Average of all sizings from roll crushing at setting 2.
No. 3: Average of sizings of last 3 samples from rod milling condition 1, — 3/16 inch + 25 mesh feed. Taken after 10, 15 and 20 minutes running.
No. 4: Average of sizings of last 4 samples from rod milling condition 2, composite No. 7 + No. 14 feed. Taken after 30, 35, 40 and 45 minutes running.
No. 5: Average of sizings of last 3 samples from rod milling conditions 3*a*. Taken after 10, 15 and 20 minutes running. Feed as No. 4.
No. 6: Sizing of last sample taken from rod milling condition 3*b*. Taken after 20 minutes running. Feed as No. 4.