

cracks. From 46.45 to 47.25—a fine crown crack. From 47.25 to 54.70—free from cracks. From 54.70 to 55.75—fine crown crack. From 55.75 to 56.50—free from cracks. From 56.50 to 58.10—fine crown cracks. From 58.10 to 60.00—free from cracks.

8 m. 60.00 to 61.50—fine crown cracks.

61.50 to 62.50—free from cracks.

62.50 to 63.56—fine crown crack.

63.56 to 64.25—free from cracks.

64.25 to 65.00—fine crown crack.

65.00 to 66.50—free from cracks.

66.50 to 79.00—fine crown crack.

79.00 to 9 m. 1.80—free from cracks.

9 m. 1.80 to 2.50—fine springing crack on left side.

2.50 to 3.00—fine springing crack on left side, plus fine crown crack.

3.00 to 5.80—very fine springing crack left wall.

5.80 to 6.50—free from cracks.

6.50 to 8.00—very fine springing crack right side.

8.00 to 8.25—free from cracks.

8.25 to 10.00—fine crown crack and very fine springing crack left and right walls.

10.00 to 10.10—springing crack, very fine, left and right walls.

10.10 to 11.00—free from cracks.

11.00 to 13.75—springing crack, fine, right wall.

13.75 to 26.25—free from cracks.

26.25 to 27.75—very fine springing crack right wall.

27.75 to 28.25—free from cracks.

28.25 to 29.50—fine springing crack right wall.

29.50 to 39.00—free from cracks.

39.00 to 40.50—springing crack right wall.

40.50 to 45.25—free from cracks.

45.25 to 46.00—crown crack $\frac{3}{8}$ in.

46.00 to 46.50—free from cracks.

46.50 to 53.00—crown crack, gradually increasing in width from fine to $\frac{1}{4}$ in.

53.00 to 54.50— $\frac{1}{4}$ in. crown crack, plus $\frac{3}{8}$ in. to $\frac{1}{4}$ in. crack, right wall at half wall height.

54.50 to 59.50—crown crack decreasing from $\frac{1}{2}$ in. to $\frac{1}{16}$ in., and wall crack, left wall, only $\frac{1}{32}$ in. to $\frac{1}{16}$ in.

59.50 to 60.50—fine wall crack left wall.

60.50 to portal, 66.86—free from cracks.

A very fine crack has developed in the crown at the portal.

Borings in the walls and arches of both tunnels were carried out at regular spacings, and from the data thus obtained, and evidence submitted at the inquiry, the Committee has obtained the following picture of the work carried out in the tunnels and the defects shown therein:—

FORDELL TUNNEL (3 m. 68 ch. to 4 m. 60.45 ch. = 72.45 ch.)

1. *North End* (S. Mitchell and Party), (3 m. 68 ch. to 4 m. 29 ch. = 41 ch.)—

(1) Country generally sandy throughout.

(2) Concrete all hand-placed.

(3) No cracks for first 18 ch.—then cracked for 19 ch. along right wall and 17 ch. along left wall—last 4 ch. free from cracks. The uncracked portion at the commencement is through fairly good standing country, but, where the cracks follow, the sand is much looser, and where they cease the arch runs through papa. Length cracked about 47 per cent.

(4) Average concrete thickness (inches)—

					Over Full Length.	Over Cracked Portion.
Left wall	..	..	..	..	12.65	12.15
Right wall	..	..	..	..	12.75	13.10
Left shoulder	..	..	..	..	10.70	10.40
Right shoulder	..	..	..	..	11.30	11.00
Crown	..	..	..	..	8.50	9.00

(5) The walls are almost entirely of the full 12 in. thickness demanded and generally a good job. The main defect lies in the existence of substantial cavities over the arch, these extending generally over its whole width and not merely over the crown. Work shows fairly good effort, but evidently influenced by an effort to keep wall thickness at the minimum required.

2. *South End* (R. Day and Party), (4 m. 29 ch. to 4 m. 60.45 ch. = 31.45 ch.)—

(1) Country half sand and half papa for first 7 ch., followed by soft papa for 21 ch., with $3\frac{1}{2}$ ch. of slip near the portal. The last 11 ch. of the papa is either damp or wet.

(2) Concrete all hand-placed.