

- (3) No cracks for the first 10 ch., then cracked along both walls for the next 14 ch., followed by 1 ch. free from cracks and then by 3 ch. cracked along one wall, the last $3\frac{1}{2}$ ch. to the portal being uncracked. Weepholes were provided for 5 ch. from the south portal, but not elsewhere, as the country was dry when excavated, though some $9\frac{1}{2}$ ch. have since become wet. Length cracked, 53 per cent.
- (4) Average concrete thickness (inches)---

	Over Full Length.	Over Cracked Portion.
Left wall	13.40	12.30
Right wall	13.20	12.60
Left shoulder	12.80	11.17
Right shoulder	12.70	12.20
Crown	9.35	9.45

- (5) The walls are more than the full 12 in. demanded, and the arch is generally reasonably well filled, except for the cavity left over the crown. The archwork on the whole is better than at the north end. Cracks occur largely in papa country, where the thickness of lining demanded has proved to be inadequate. Appears to have attempted to do a good job.

TURAKINA TUNNEL (8 m. 43. ch. to 9 m. 67 ch. = 104 ch.)

1. *North End* (Hansen and Party), (8 m. 43 ch. to 9 m. 15 ch. = 52 ch.)---

- (1) For the first 36 ch. the country is heavy packed sand, and for the balance coarse gritty sand over the arch, with clay pug below.
- (2) The concrete was hand-placed for the first 17 ch. and for the balance gun-placed.
- (3) The first 12 ch. is free from cracks, except for 2 ch. of fine crack along the crown. In the next 12 ch. half the length is similarly cracked. This is followed by some 12 ch. cracked throughout along the arch. The remaining 16 ch. has about $9\frac{1}{2}$ ch. showing fine cracks along the springing. No cracks appear in the side walls.
- (4) Average thickness of concrete (inches)---

	Hand-placed.	Gun-placed.
Left wall	12.0	16.0
Right wall	12.8	15.7
Left shoulder	18.2	16.7
Right shoulder	18.7	17.6
Crown	6.9	11.9

- (5) The hand-placed work is well done and up to demands along the walls and shoulders, but the crown is badly filled for a considerable length.

The gun-placed concrete is thicker because the effort to save concrete by restricting the thickness to 12 in. was abandoned. The work is generally well done except for cavities immediately over the crown and due mainly to the type of timbering used. Shows an honest attempt to do a good job, except that hand-placing on crown is deficient.

2. *South End* (Murch and Party), (8 m. 15 ch. to 9 m. 30 ch. = 15 ch.)---

- (1) The country was shingly sand over the arch and half-way down the walls with clay pug below.
- (2) All concrete was gun-placed.
- (3) The work is free from cracks except for about $2\frac{1}{2}$ ch. of fine crack along the spring near the end.
- (4) The average concrete thickness was (inches)---

Left wall	14.8
Right wall	15.7
Left shoulder	14.8
Right shoulder	16.2
Crown	11.4

- (5) The work is generally satisfactory except for cavities over the crown. Shows evidence of an attempt to do a good job.

3. *South End* (Sullivan and Party), (9 m. 30 ch. to 9 m. 36 ch. = 6 ch.)---

- (1) The country consisted of clay pug along the floor and for about 2 ft. 6 in. up the walls, with shingle and coarse gritty sand above.
- (2) All concrete was gun-placed.
- (3) The work is free from cracks.
- (4) The average concrete thickness is (inches)---

Left wall	15.6
Right wall	16.0
Left shoulder	14.5
Right shoulder	16.0
Crown	11.8

- (5) Except for cavities along the crown, the work is well done. Shows evidence of an attempt to do a good job.