TR18.146-152

## 22. Blasting the lift span counterweights of old Hobart Floating Bridge.

*W.R. Tindal*

The decision to remove the structure of the lifting section of the old Hobart Floating Bridge presented the problem of how to dispose of the large reinforced concrete counterweights.

The counterweights had to be disconnected from the lifting section and then lowered to near the deck level (the bottom of the counterweight was 4.3 m above the deck). The mass of each counterweight was approximately 178 t.

Blasting design was influenced by the shape of the counterweight, the position of the reinforcing steel and the suspension structure.

Because of the shape of the counterweight (fig. 1) it was necessary to demolish each block in three stages. The first stage was from section A-A to section C-C; the second stage was from section B-B to section C-C and the third stage was below section C-C (fig. 1).

Owing to the amount and shape of the reinforcement it was necessary to almost pulverise the concrete from the reinforcement.

It was decided to use stepped charges and cushion blasting. Hole charges for each section are shown in Figures 2 (western counterweight) and 3 (eastern counterweight).

Instantaneous detonating fuse was used to hold the charges together for loading and as a means of detonation.

Sand was only used for tamping the top section of each hole.

Hole patterns for each stage of blasting are shown in Figures 4 (western counterweight) and 5 (eastern counterweight).

A test blast was made on the eastern half of the stage 1 blast of the western counterweight on the morning of 13 July 1973.

Particulars of the blast:

Time of blast 1030 hours
Number of holes 41
Diameter of holes 37 mm
Depth of holes 2.21 m
Delays millisecond detonator 2 off numbers 0, 3-14
3 off number 15
4 off numbers 16-18
Mass blasted 35 t
Mass of explosives 17.7 kg
Maximum mass of explosives per delay 1.72 kg
Mass of explosives/$m^3$ 1.735 kg
Blast pressure at 240 m 2Pa.

The blast completely removed the concrete from the reinforcement, with very little fly rock, to the depth of the drilling.

As a result of this blast a similar blast was carried out on the other side of stage 1 of the western counterweight with similar results on the same day at 1630 hours.

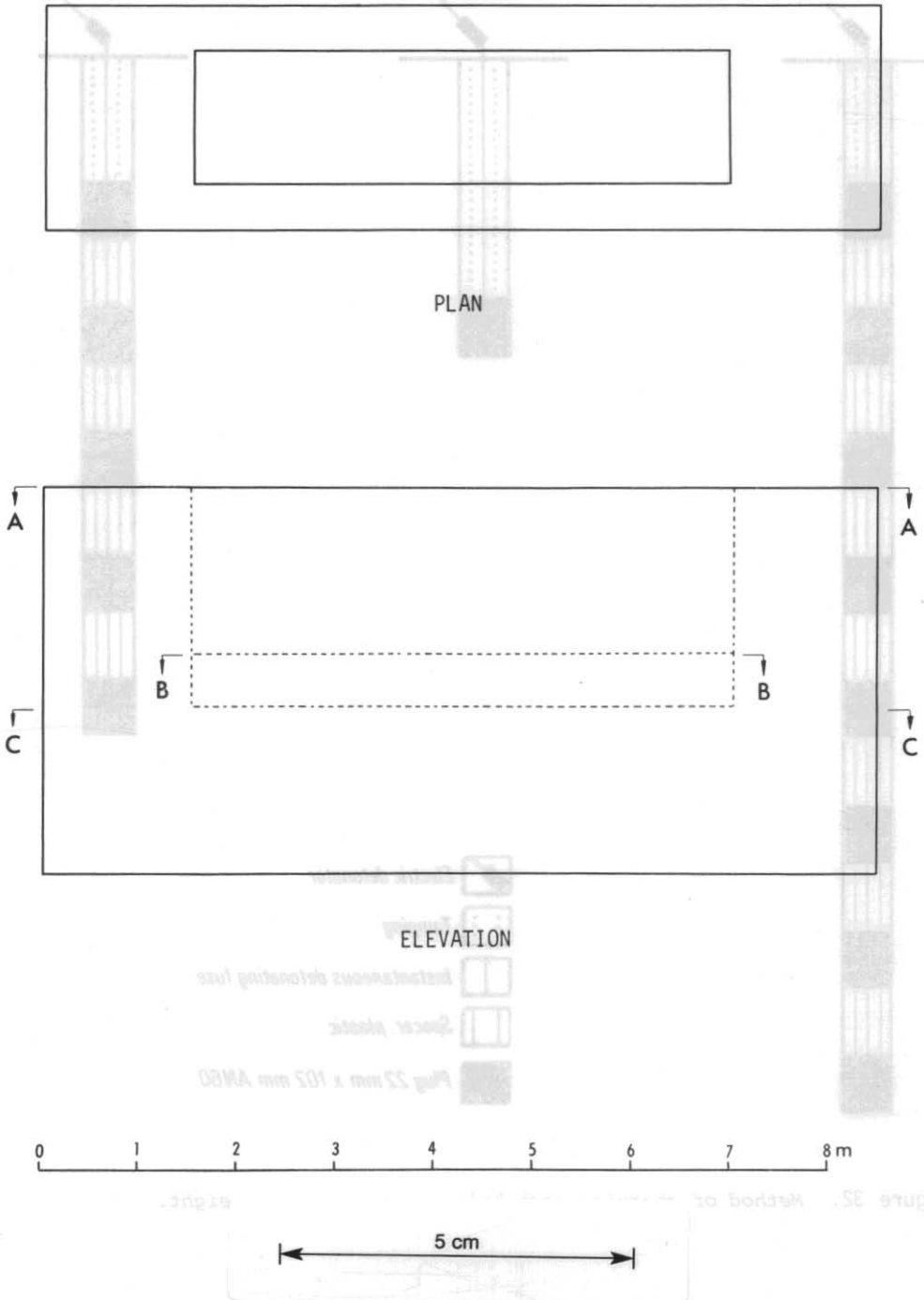



Figure 31. *Lift span counterweights. Depth of filling (Section B-B) 0.46 m for eastern and 0.61 m for western counterweight.*

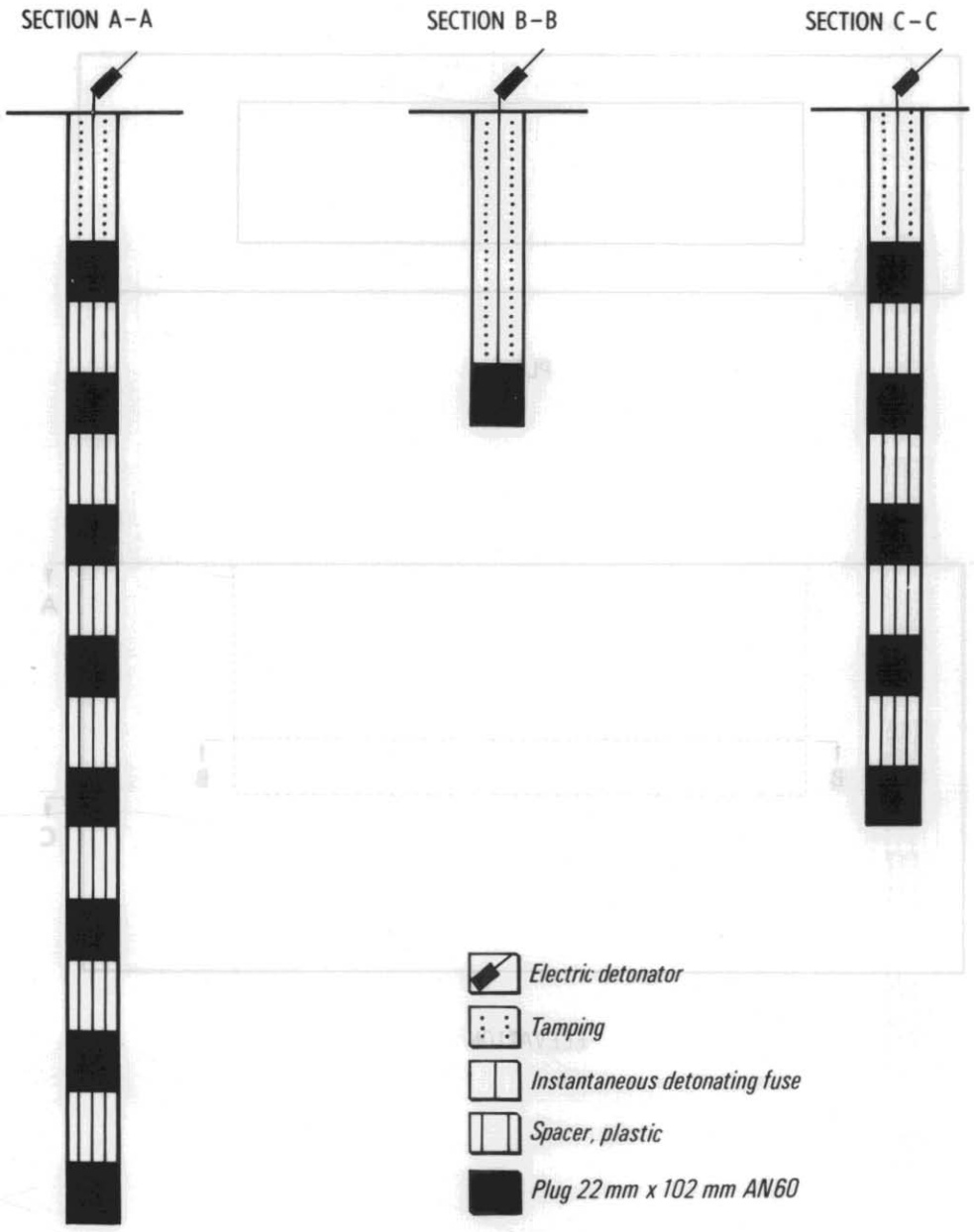



Figure 32. *Method of charging each hole, western counterweight.*

5 cm

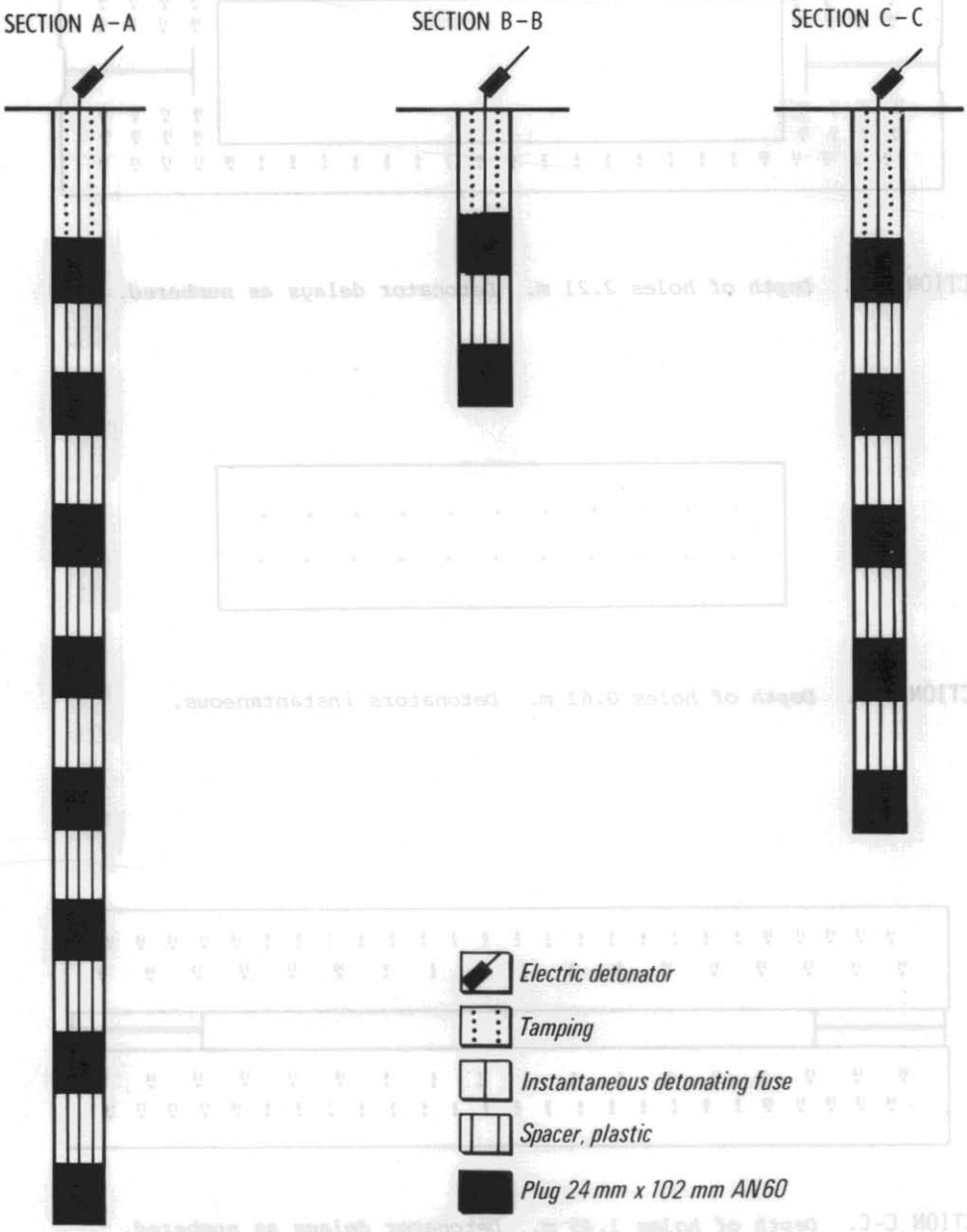
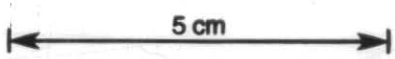
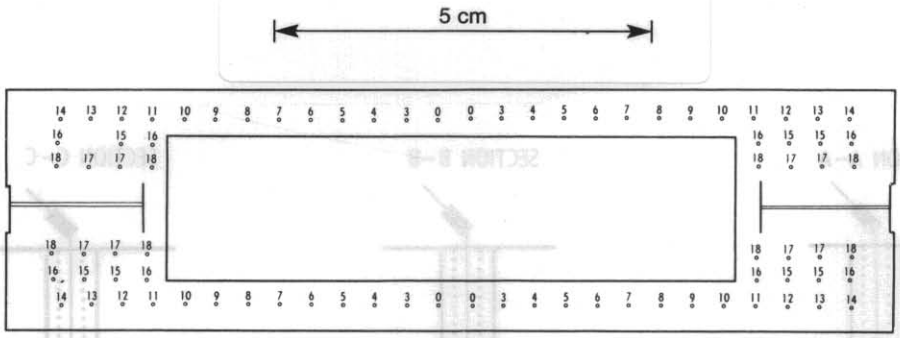
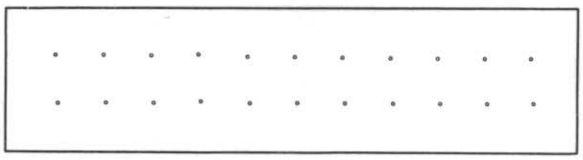



Figure 33. *Method of charging each hole, eastern counterweight.*

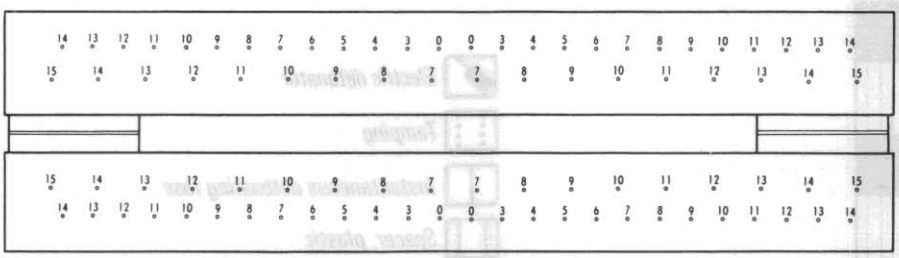





SECTION A-A. *Depth of holes 2.21 m. Detonator delays as numbered.*



SECTION B-B. *Depth of holes 0.61 m. Detonators instantaneous.*



SECTION C-C. *Depth of holes 1.45 m. Detonator delays as numbered.*

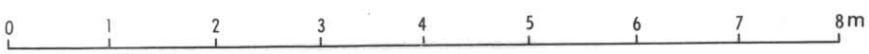
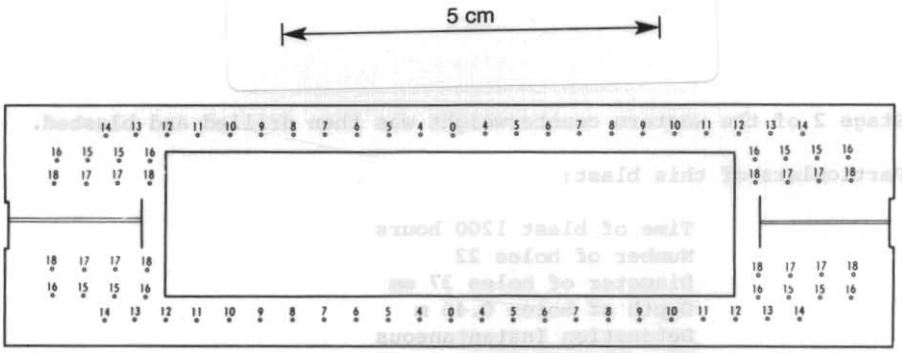
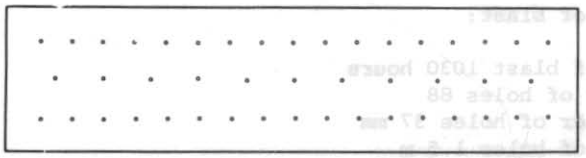


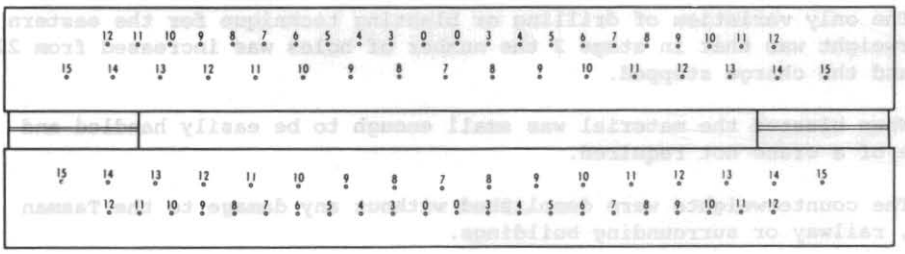

Figure 34. *Drilling pattern for western counterweight.*




SECTION A-A. *Depth of holes 2.21 m. Detonator delays as numbered.*



SECTION B-B. *Depth of holes 0.46 m. Detonators instantaneous.*



SECTION C-C. *Depth of holes 1.45 m. Detonator delays as numbered.*

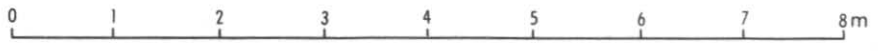



Figure 35. *Drilling pattern for eastern counterweight.*

Stage 2 of the western counterweight was then drilled and blasted.

Particulars of this blast:

Time of blast 1200 hours
Number of holes 22
Diameter of holes 37 mm
Depth of holes 0.46 m
Detonation Instantaneous
Mass blasted 12 t
Mass of explosives 1.2 kg
Mass of explosives/$m^3$ 0.34 kg.

This blast cracked the mass of concrete into blocks. A crane was needed to lift these blocks.

Stage 3 was blasted as one blast on Wednesday 18 July 1973. The result was similar to both blasts of stage 1.

Particulars of blast:

Time of blast 1030 hours
Number of holes 88
Diameter of holes 37 mm
Depth of holes 1.5 m
Delays millisecond detonators 4 off 0, 3-6, 15
8 off 7-14
Mass blasted 120 t
Mass of explosives 25.4 kg
Maximum mass of explosives/delay 2.15 kg
Mass of explosives/$m^3$ 0.74 kg.

The eastern counterweight was demolished in three blasts similar to the western counterweight. The respective blasts took place on 13 August at 1150 hours, 14 August at 1030 hours and 16 August at 1030 hours.

The only variation of drilling or blasting technique for the eastern counterweight was that in stage 2 the number of holes was increased from 22 to 45 and the charge stepped.

When blasted the material was small enough to be easily handled and the use of a crane not required.

The counterweights were demolished without any damage to the Tasman Bridge, railway or surrounding buildings.

[24 August 1973]