

Our ref: 4459

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21st December 2006

Attention: Ms. Fleur Mellor

Dear Madam,

**RE: ELECTROLYSIS TESTING AT SITE 4B
SYDNEY OLYMPIC PARK**

As requested, Corrosion Control Engineering (NSW) P/L carried out electrolysis testing at the above development site (Corner Olympic Boulevard and Herb Elliot Drive), Homebush Bay. This was done over the period 19th to 20th December 2006.

THE ELECTROLYSIS PROBLEM

Most of the DC current to power the electric trains returns to the railway sub stations via the rail lines, the desired path. However, some leaks to ground (stray traction current) and in returning to the substation via this path can be picked up (and discharged) from metallic structures, in or on the ground, leading to possible electrolysis type corrosion problems. The problems can be significant if:

1. The metallic structures are close to the electrified railway lines and are large (or long) enough.
2. The stray traction current leakages to soil are of sufficient frequency and magnitude to cause a problem.

TEST METHOD AND RESULTS

Data loggers were used to monitor stray traction caused voltage fluctuations between steel earth stakes installed in the ground at the development site. The loggers to record voltage fluctuations over a 24-hour period with the results used to assess the frequency and magnitude of stray traction currents and their corrosion hazard.

Following a site inspection the earth stakes were installed as follows:

- a) One pair perpendicular to the electrified rail lines. These pegs were installed 18 metres apart. The recorded results are shown in the attached chart.
- b) A second pair of stakes were installed parallel to the rail lines. At this location spot potential testing only was carried out.

DISCUSSION OF RESULTS AND CONCLUSION

Both sets of results (parallel and perpendicular to rail) show small voltage fluctuations caused by strain rail traction currents, in range of 10-15 millivolts.

The maximum acceptable millivolt effect as nominated by the NSW Electrolysis Technical Committee is 20-millivolt adverse effect and 100 millivolt beneficial effect. The field test results as shown on the charts are well within these acceptable limits.

In conclusion the present magnitude of the recorded stray traction current are not of an order to likely be a significant corrosion hazard to the proposed building foundations or in ground metallic structures at the site. However, future changes in ground conditions and / or stray DC currents may alter electrolysis effects.

However, we suggest consideration be given to:

- i) Installing plastic sheeting (Forticon or equivalent) below the concrete slab and footings
- ii) Where possible, the building design limits the below ground steel rebar and other metallic structures to relatively small lengths.

We trust you find our testing and report satisfactory. Should you have any queries, please do not hesitate to contact us.

Yours faithfully

Corrosion Control Engineering (NSW) Pty Ltd

Jim Galanos
Engineering Manager