ANNEXURE J

RAIL STRAY CURRENT ELECTROLYSIS REPORT
Prepared by
CORROSION CONTROL ENGINEERING

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AV Jennings

27th February 2008

Attention: Mr. Mark Collison
Email: MCollison@avjennings.com.au

Dear Sir,

RE: ELECTROLYSIS TESTING AT SOP SITE 13

As requested, Corrosion Control Engineering (NSW) Pty Ltd carried out electrolysis testing at the above development site at Haymarket. This was done over the period 25th to 26th February 2008.

THE ELECTROLYSIS PROBLEM

Most of the d.c. 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 especially if large (or long).

2. The stray traction current leakages to soil are of sufficient frequency and magnitude to cause a problem.

TEST METHOD

As discussed, it was proposed to monitor the in-ground stray traction caused voltage fluctuation by carrying out the following tests:

1. Install a data-logger between earth stakes approximately perpendicular to the electrified rail lines to record over a 24-hour period. In this case the earth stakes were installed about 16 metres apart in a non-bitumenised and low car traffic movement area.

2. Install a data logger between earth stakes approximately parallel to electrified rail, on development property. Again the earth stakes were installed in a non-bitumenised and low car traffic movement area at about 11 metres apart.

3. Install a data logger on an in ground metallic structure on the development property. This was done on a metallic cable conduit at the site.

   The 24 hour data logger charts, for above three locations, are attached.

TEST RESULTS

Test Performed	Test Duration	Observed Results
1. 24-hour potential recording between steel earth stakes, approximately perpendicular to rail.	Approximately 24 hours	Maximum fluctuations range of about 30mV Most within 20mV (average)
2. 24-hour potentials between steel earth stakes, approximately parallel to rail.	Approximately 24 hours	Maximum fluctuations range of about 20mV Most within 10mV (average)
3. On metallic water fixture found at the site.	Approximately 24 hours	Maximum fluctuations range of about 20mV Most within about 10mV

DISCUSSION OF RESULTS

The results show there are some stray traction currents present at the site.

The logger chart (see attached) for stray traction caused voltage fluctuations between earth stakes perpendicular to rail show low fluctuations, less than 30mV, over the 24-hour period. The shift at roughly 10:18am would not have been caused by stray traction and can be ignored.

The logger charts for the earth stakes approximately parallel to rail show insignificantly small stray traction current effects over the 24-hour period.

The logger charts for the metallic water fixture show some unusual fluctuations from 7:00am. These spikes were not caused by stray traction and can be ignored. The stray traction recorded was insignificantly small.

We conclude the present stray traction currents, at the proposed building site, are unlikely to be a significant corrosion hazard to in or on ground metallic structures. However it should be noted that stray traction current effects, at the site, will almost certainly change with time and may, at some time in the future, become a significant corrosion hazard.

RECOMMENDATIONS

We conservatively recommend consideration of the following protective measures, where applicable, to mitigate any possible corrosive effects of stray traction currents:

1. The installation of heavy plastic membrane (e.g. Forticon) under (or behind) all reinforced concrete slabs and /or piers to electrically isolate the slabs and/or piers from soil and the stray currents.

2. The installation of the same plastic membrane under (or behind) any reinforced concrete retaining wall to electrically isolate from the ground.

3. The use of plastic, rather than metallic, in-ground pipework where possible.

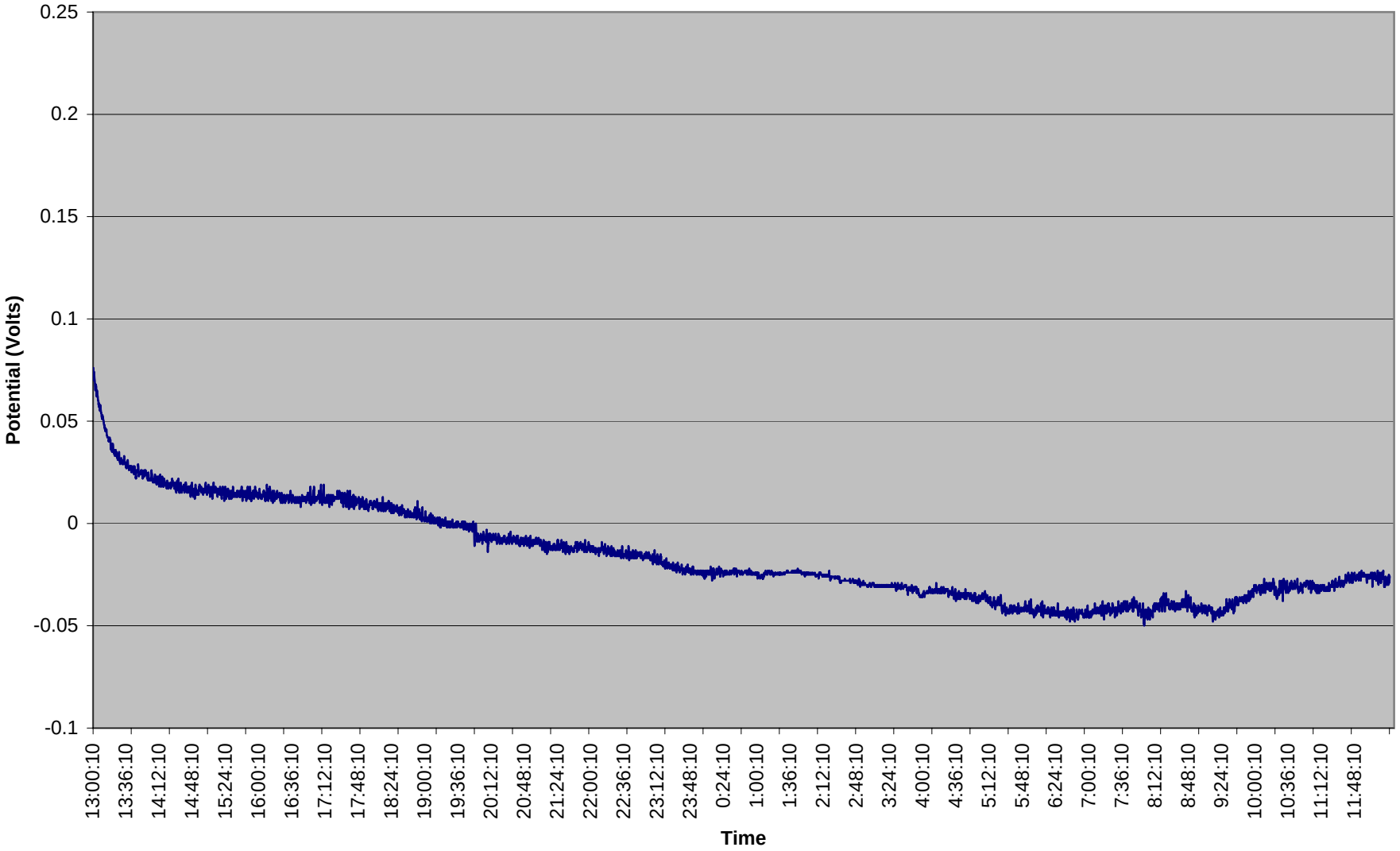
Please note, an alternative to using plastic to isolate concrete pier or slab reinforcing steel from the ground, is to use high strength, high cover waterproof concrete to effectively prevent soil moisture penetrating through to the reinforcing steel.

We trust you find our report to be satisfactory. Should you have any further queries, please do not hesitate to contact our office.

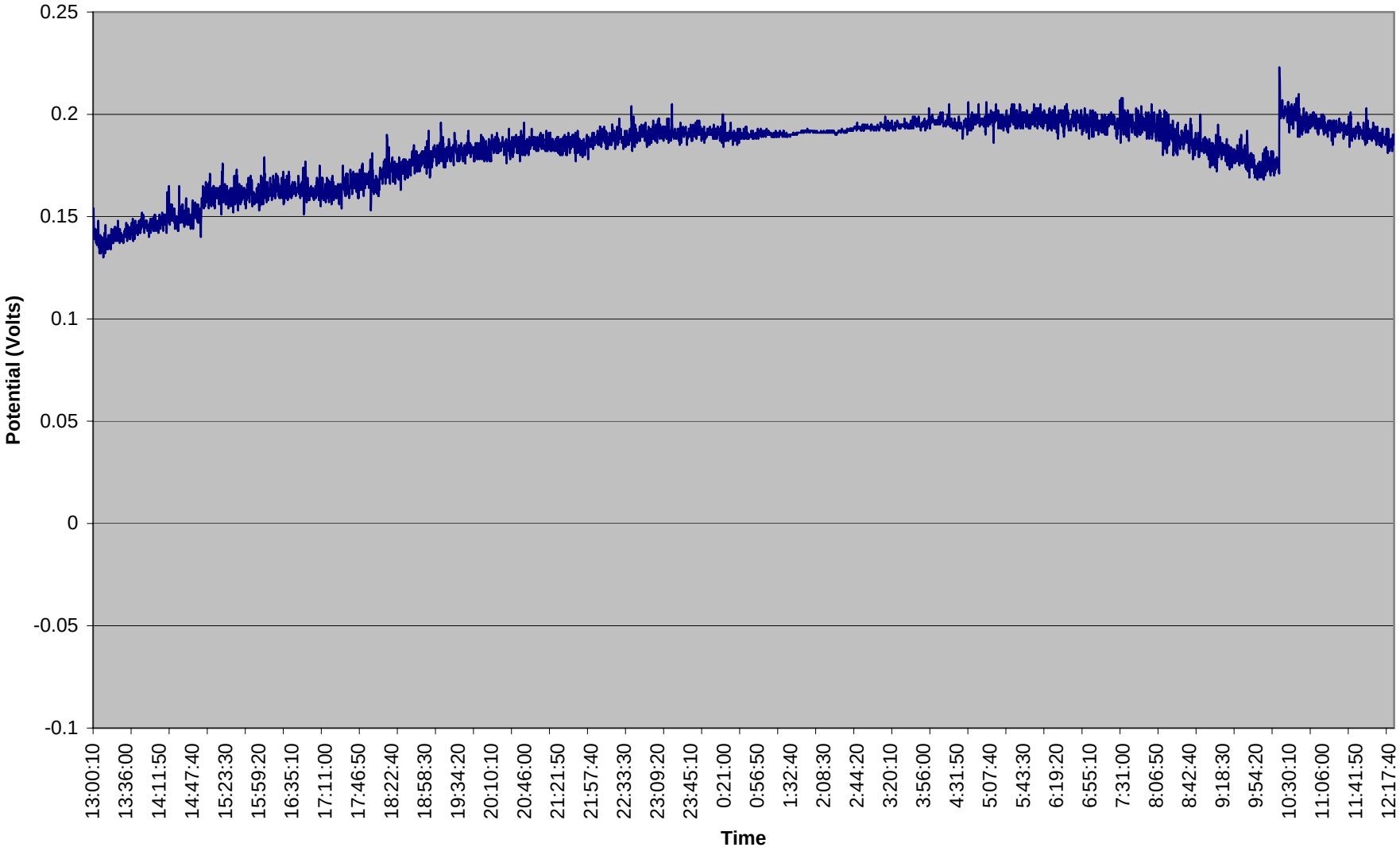
Yours faithfully,
Corrosion Control Engineering (NSW) Pty Ltd

Alan O'Connor
Corrosion Engineer

SOP Site 13 Parallel To Rail (25/26-02-08)



SOP Site 13 Perpendicular To Rail (25/25-02-08)



SOP Site 13 Water Fixture (25/26-02-08)