



Office of the  
Coordinator  
General of Rail

PO Box K349  
Haymarket NSW 1238  
Australia  
[www.coordgenrail.nsw.gov.au](http://www.coordgenrail.nsw.gov.au)

TO: Minister for Transport Services  
FROM: Coordinator General of Rail  
SUBJECT: Audit of Wrought Iron Bridges and Nominated Structures  
DATE: 30 May 2003

---

On 22 May, I provided you with the audit report on the maintenance of wrought iron bridges. That report indicated that additional audits were being undertaken, including the Stanwell Park Viaduct.

I have attached for your information the inspection and condition assessment report by Cardno MBK dated 22 May and the covering letter from RIC dated 26 May.

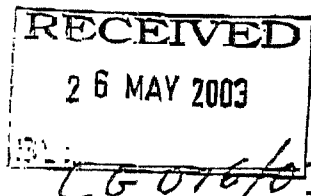
Further detailed investigation of this structure is continuing however the attached inspection report includes –

“That at this stage of our investigation it can be said that the viaduct appears to have the same load carrying capacity as it had following remedial works in 1992/93”.

As reported to you in the 22 May report, RIC continues to monitor this viaduct on a weekly basis and measured parameters are within acceptance tolerances.

  
Vince Graham  
Coordinator General of Rail

Our ref: 03D/02363  
df052



22 May 2003

Level 15, 55 Market Street  
Sydney NSW 2000

GPO Box 47  
Sydney NSW 2001

Telephone 02 9224 2330  
Facsimile 02 9224 2724

Vince Graham  
Coordinator General of Rail  
Level 6  
18 Lee Street  
SYDNEY NSW 2000

Dear Vince

**Subject: Coordinator General of Rail Audit of Wrought Iron and Nominated Structures**

At our meeting on 20<sup>th</sup> May 2003, I undertook to provide you with a preliminary report from consultants Cardno MBK for the Stanwell Park Viaduct by 23<sup>rd</sup> May 2003.

Please find attached preliminary inspection and condition assessment notes from Cardno MBK dated 21<sup>st</sup> May 2003.

In summary, the Cardno MBK team reported that despite the cracks evident in the spandrel walls of the viaduct, "the arches appear to be continuing to function adequately, primarily as compression members, to support dead and live loads."

They further note that "the viaduct appears to have the same load carrying capacity as it had following the remedial work in 1992 / 1993."

A complete summary of recorded geotechnical movements since 1991 has been requested by Cardno MBK, and this will be supplied by 26<sup>th</sup> May 2003. Their final report for Stage One is due on 30<sup>th</sup> May 2003.

Stage Two investigation that will include a detailed study of the behaviour and capacity under centrifugal and earthquake forces is expected to be completed by 27<sup>th</sup> June 2003.

As noted in my letter to you of 21<sup>st</sup> May 2003 regarding the Georges River Bridge at Como, RIC intends to trial asset management improvement strategies at a number of locations, including Stanwell Park. I will keep you updated on progress of the Cardno MBK report and the trial.

Yours sincerely

**GARY SEABURY**  
Acting Chief Executive Officer

## Facsimile Transmission



Engineering the Future

Attention: Ken Cheong / Joe Muscat

Organisation: Rail Infrastructure Corporation

Sent by: Richard Woods [rwoods@syd.cardno.com.au](mailto:rwoods@syd.cardno.com.au)

Date: 21 May, 2003

File No: 848623-LO-3 No. of Pages: 2 + 3

Fax No: 9782 1600  Urgent  Routine

Copy : Ben Chung - 9224 4057

Cardno MBK (NSW) Pty Ltd  
ABN 95 001 145 035

Level 3, Cardno Building  
910 Pacific Hwy, Gordon  
New South Wales 2072

Australia

International: +61 2 9496 7700

Email: [sydney@syd.cardno.com.au](mailto:sydney@syd.cardno.com.au)

Web: [www.cardno.com.au](http://www.cardno.com.au)

Telephone: 02 9496 7700

Facsimile: 02 9499 3902

### Re: Stanwell Park Viaduct – Inspection and Condition Assessment

An inspection of the Stanwell Park Viaduct was carried out by Richard Woods and Peter Moeller from this office on Thursday 15<sup>th</sup> May, 2003. The inspection was visual only from track level, from the steel walkway on the up side and from the steel accessway and platforms at the arch springing level from Span 1 to Span 6. Following is a preliminary report on the observations made during that inspection regarding the condition of the parts of the viaduct, including access structures.

The condition of each part of the structure is presented in the attached table which also includes comments on the background to some of the rectification work that has been carried out on the viaduct. In our Stage 1 Interim Report we will provide annotated diagrams describing the location and nature of “defects” in the various parts of the structure and photographs of the major “defects”.

It should be pointed out that some of the major defects (brickwork cracks etc) that were recorded during our investigation in 1991/92, and also recorded by other consultants prior to our involvement, have been addressed by the remedial work that was carried out in 1992 and 1993. This work included construction of a reinforced concrete slab under the ballast. The major cracking of the spandrel brickwork was addressed by tying the spandrels to the reinforced concrete slab at regular intervals. The cracking of the brick parapet was addressed by installing regularly spaced vertical steel dowel bars through the parapet into the spandrel brickwork.

Therefore, although these particular defects (cracks) remain apparent, they have been addressed by remedial work and should be considered to be “non-current” or “inactive” defects. There remains a possibility that small pieces of brickwork may spall or dislodge from the parapets or spandrels over time but such events would not be considered failures of the components. Also, the brick spandrels and parapets should only be considered as secondary structural members as they do not play a significant role in the primary function of the viaduct of supporting the rail traffic. The construction of the reinforced concrete slabs under the ballast means that the spandrels are no longer required to retain the fill between arches

*Please check all sheets have been transmitted and are legible. If not, ring or send a facsimile immediately. If this facsimile has been sent to you by mistake, please phone us and return the facsimile to us by mail. This facsimile may contain confidential information and if you have received it by mistake you must not use this facsimile or the information it contains, in any way.*

Stanwell Park Viaduct – Inspection and Condition Assessment

Stanwell Park Viaduct – Inspection and Condition Assessment – May, 2003

Element	Condition	Additional Comments
1. Brick Arches	<p>Generally the condition of the brick arches appear to be largely unchanged since the 1992 Report. The through cracks in the arches appear to be of the same width (small) as previously reported. Additional minor cracks may be evident in Span 3 (one extra) and Span 5 (two extra). It is likely that the many of the cracks in the brick arches have been partially filled with the leachate from the filling behind the arch.</p>	<p>It was not possible to inspect the brick arch in Span 8 due to access limitations.</p>
2. Brick Spandrels	<p>In most spans the spandrel has separated from the arch near the crown. The width of the separation crack varies from span to span but generally appear to be of the same magnitude as observed in 1992. The severe cracking of the spandrel brickwork, extending into parapets, that was reported in 1992 does not appear to have significantly worsened in either extent or crack size and displacement.</p>	<p>The work carried out following our 1992 report included construction of concrete slabs under the ballast and tying the spandrels and parapets to this concrete and connection of the parapet to the spandrels by steel dowels. As such, the spandrel cracks can be considered to be "inactive defects".</p>
3. Brick Parapets	<p>There is extensive cracking of the brick parapets in most spans with the most severe cracking near the middle of the viaduct. This cracking was reported in 1992 and does not appear to have significantly worsened in either extent or crack size and displacement since then.</p>	<p>As for brick spandrels, the cracks in the brick parapets have been addressed by installation of dowel bars and can be considered to be "inactive defects".</p>
4. Brick Piers	<p>Brick piers appear to be in good condition with no obvious cracks. However, due to access limitations, it was not possible to inspect piers at close range or to inspect the founding of the piers.</p>	
5. Steel Tie Rods	<p>The steel tie rods, and their anchorages to the brick work, are all in reasonable condition. The rods are enclosed in polypropylene tubes and so are concealed for much of their length. Where the surface is exposed,</p>	<p>Steel tie rods at the springing level were installed prior to our involvement in 1991/92. They remain in place (4 per span) except that they were removed from Span</p>

	<p>surface corrosion has occurred but there is no significant loss of cross sectional area. Similarly, the steel anchor blocks show surface corrosion with no significant loss of section.</p> <p>In the central spans, the tie rods have sagged to varying degrees, even within the one span. This indicates closing of the gap between springing points of the arch although it only requires a small movement to cause significant sag. Rods that have sagged will have lost their initial prestress.</p>	<p>6 after the propping platform was installed. It is not possible to inspect the section of rod inside the brickwork where corrosion may be worst.</p> <p>Because of the propping platform in Span 6, the tie rods are largely redundant so their condition is not too significant.</p>
<p>6. Steel Girder Span</p>	<p>The girder span in Span 6, comprising precast concrete slabs on steel I-Girders, appears to be in reasonable condition. Water leaking through the joints between deck slab units has caused some localised surface corrosion of the painted steel girders. This has occurred at the outer edges of the bottom flanges, towards the ends of the girders. There does not appear to be any significant loss of cross sectional area. The deck slabs appear to be in good condition as do the RC sill beams supporting the girders.</p>	<p>It was not possible to inspect the girder bearings or the expansion joint due to access limitations.</p>
<p>7. Steel Arch and Shotcrete</p>	<p>The shotcrete and exposed steelwork in Span 4 appear to be in good condition. The galvanised surface of the steelwork appears to have provided good protection. Leaching product has stained the steelwork in some isolated locations. There is some minor leaching through the shotcrete but it is not significantly worse than in 1992.</p>	<p>Strengthening of Span 4 arch by means of steel arches encased in shotcrete was constructed prior to our involvement in 1991/92</p>
<p>8. Steel Platforms</p>	<p>The steel platforms in Spans 4 and 6 are of galvanised steel sections with a gridmesh floor. The steelwork appears to be in good condition. The platform in Span 6 acts to prop the arch at the springing point, with the ends of the longitudinal beams packed against the brickwork. The packing is in sound condition without any gaps, indicating that the propping is active.</p>	<p>The platform in Span 4 was installed as part of the work prior to our involvement in 1991/92. The platform in Span 6 was designed and documented by this firm.</p>
<p>9. Steel Accessway</p>	<p>The accessway from the Sydney end through to Span 6 on the up-side is</p>	

	constructed from galvanised steel sections with a gridmesh floor. The steelwork, including connections to the brick piers, appear to be in good condition.	
10. Steel Walkway	The walkway on the up-side at track level is constructed from galvanised steel sections with a gridmesh floor. The steelwork, including connections to the brickwork and slabs behind, appear to be in good condition.	The steel walkway at track level was designed and documented by this firm following our report in 1992.
11. Concrete Infill Slabs	The reinforced concrete infill slabs under the ballast are not visible and so it is not possible to verify their condition. There is no evidence of deterioration from an external view. These slabs anchor the cracked brick spandrels.	The concrete infill slabs under the track ballast were designed and documented by this firm following our report in 1992.