

Technical Note 107

Steelwork Inspection Requirements

November 2015

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1 Scope

All fabricated steelwork is fabricated in accordance with MRTS78 *Fabrication of Structural Steelwork*.

The purpose of this document is to explain the Transport and Main Roads (TMR) requirements for the inspection of structural steelwork to the TMR specification.

2 Inspections of structural steelwork

The TMR specification has a number of hold points which need to be signed off by the Administrator. In order to facilitate the approval of the hold point, Engineering inspections will need to be documented in a certain way, so we can ensure all steelwork will be inspected in the same manner.

The inspections shall be carried out during the fabrication process and the following inspection reports shall be supplied:

- Report outlining the welding procedures provided match the welds specified on the approved Registered Professional Engineers Queensland (RPEQ) Engineering drawings.
- Report outlining the review of the material test certificates to show compliance with the appropriate Australian Standards specified on the approved RPEQ Engineering drawings. The report shall state the member size and grade used in the structure. The report shall also outline the heat number and material test certificate number for the material supplied.
- Report outlining the review of the material test certificates for the bolts to show compliance with the appropriate Australian Standards specified on the approved RPEQ Engineering drawings. The specification requires the bolts to be tested as an assembly and the material test certificate shall be referenced to the assembly test report.
- Report outlining which butt weld preparations were inspected. This report shall include photos of each type of butt weld inspected with a bevel gauge showing the joint matches the approved welding procedure sheet.
- Report outlining the completed welds which have been inspected. The report shall show the welds inspected with the appropriate weld fillet gauge to show the conforming welds and the report shall show any welding defects identified in the inspection.
- Report outlining the non-destructive testing carried out in accordance with the specification.

3 TMR documents

TMR has a standard inspection document which can be used for the generation of the inspection reports.

The report is a live document and is changed during the fabrication process. An example of a small project is attached to this technical note to explain the information contained above.

Bridge Construction Materials Inspection Report Steel Components



Report No.:	Wieambilla Bridge Rail Report 2	Structures Division Structural Materials Branch
Job name:	Wieambilla Creek Bridge	
Job. No.:	33/342/8	Items Inspected:
Region:	Darling Downs	Bridge Rail
Date of inspection:	8 September 2011	
Road:	Kogan to Condamine Road	
Manufacturer:	Fabricator	
Project Manager:	Fabricator Project Manager	
Inspected at:	Fabricator	
Inspector(s):	Paul Adams	
Administrator:	Paul Weis	
BIS No.	Unknown	
Approved:		
	Signature	Date

Details / Recommendations

Office Use Loc DMS

Introduction

On 8 September 2011, an inspection of the bridge rail for the Wieambilla Creek Bridge on the Korgan Condamine Road was undertaken at Fabricator (Fabricator).

Weld Procedure Sheet and Macro Test Results

Fabricator has supplied the following weld procedures:

WPS QB-001

This weld procedure is used for the compound butt weld at the base plate to post interface. The weld procedure is suitable for the welding to be undertaken.

WPS QB-002

This weld procedure is used for the butt weld on the top rail support member. The weld procedure is suitable for the welding to be undertaken.

WPS QB-003

This weld procedure is used for the 6 mm fillet weld on the bridge rail posts. The weld procedure is suitable for the welding to be undertaken.

Material Test Certificates

MRTS78 states that the material test certificates are to be approved before fabrication can commence.

Table 1 outlines the material test certificates that have been approved.

Table 1 – Material Test Certificates

Item	Size	Grade	Standard AS/NZS	Material Conforms Yes/No	Comment
Bridge Traffic Rail					
Posts	150 x 150 x 9 SHS	450L0	AS 1163	Yes	Heat No. 16900, 17095, (OneSteel Cert No. 1101180) Heat No. 18201, 18264, 18265 (OneSteel Cert No. 1101181)
Rails	150 x 100 x 6 RHS	450L0	AS 1163	Yes	Prod No. 11126, (OneSteel Cert No. CQ110884-0034) Prod No. 11165, (OneSteel Cert No. CQ110999-0075) Prod No. 11068, (OneSteel Cert No. CQ110410)
Terminal blocks	6 mm plate	350	AS 3678	Yes	Heat No. 7228879, (BlueScope Cert No. D62228)
Rail connectors	8 mm plate	350	AS 3678	To be supplied	
Rail anchor plates	10 mm plate	300	AS 3679	Yes	Heat No. 7638, (TS Steel Company Cert No. 11041203)

Item	Size	Grade	Standard AS/NZS	Material Conforms Yes/No	Comment
Rail support plates	12 mm plate	300	AS 3679	Yes	Heat No. S5355, (TS Steel Company Cert No. 11060107)
Post base plates	25 mm plate	350	AS 3678	Yes	Heat No. 6265959, (BlueScope Cert No. T94725)

* The steel mill material test certificate in this case did not contain all the required information. The fabricator has carried out testing of the material to ensure the material complies with the requirements of the relevant Australian Standard.

When we reviewed the post material test certificate we have noticed that the material may have a problem in the galvanising process. The Silicone level is below 0.04%. We have advised Fabricator to allow the posts to develop surface rust, so the zinc coating will bond to the material.

Bolt Test Certificates and Testing

MRTS78 states that all bolts are to be supplied with a material test certificate and are tested as an assembly.

Table 2 outlines the material test certificates that have been supplied along with the assembly testing.

Table 2 – Bolt Testing Requirements

Item	Size	Class	Standard AS/NZS	Material Test Certificate Supplied	Assembly Test	Comment
Bridge Traffic Rail						
Rail anchor bolts ELS	M16 x 40	8.8	AS 1252 AS 1237	To be supplied	To be supplied	Bolt Heat No. ??? Assembly Test Report No. ????
Rail Bolt with half lock nut	M20 x 190	8.8	AS 1252	Rail Bolt with half lock nut	M20 x 190	
Bridge Rail anchorages	M24 x 350	8.8	AS 1252	Yes	Yes	Bolt Heat No. 4310100004 Assembly Test Report No. 20111381M01
Bridge Rail anchorages	M24 x 400	8.8	AS 1252	Yes	Yes	Bolt Heat No. 3155730029 Assembly Test Report No. 20111446M01

Inspection

The purpose of the inspection was to ensure the butt weld preparations were prepared in accordance with the weld procedure sheets and the completed welds were free weld defects and the welds are the correct size in terms of leg length and throat thickness.

Intermediate Posts

The first items to be inspected were the intermediate posts at the tack up stage, Refer to Figure 1. Figure 2 shows that the butt weld preparation at the base plate to post interface has been prepared in accordance with the weld procedure sheet. Figure 3 shows that the correct root gap has been used between the base plate and the post.

Some of the intermediate posts have been welded out, refer to Figure 4. Figure 5 and Figure 6 show that the fillet weld over the butt weld is the correct size in terms of leg length and throat thickness and are free of weld defects.

We also inspected the fillet weld around the rail anchor plate. Figure 7 show that the fillet weld is the correct size.

Fabricator has stamped the base plate with a QB symbol, refer to Figure 8. This identification mark will be used for future reference at identifying who supplied the posts.

During the inspection we noticed that the hold down bolt holes were filled with weld splatter, refer to Figure 9. Fabricator advised that they would remove the weld splatter before the posts are dispatched for galvanising.

Conclusion

Fabricator is fabricating the bridge rail for Wieambilla Creek Bridge.

The purpose of this inspection was to ensure that the butt welds were prepared correctly and the completed welds were free of weld defects.

When we reviewed the post material test certificate we have noticed that the material may have a problem in the galvanising process. The Silicone level is below 0.04%. We have advised Fabricator to allow the posts to develop surface rust, so the zinc coating will bond to the material.

The butt weld preparations have been prepared in accordance with the weld procedures. The completed welds are the correct size and free of weld defects. We did notice that the latest batch of posts has weld splatter in the hold down bolt holes. Fabricator advised that they would remove the weld splatter.

Photos

Figure 1 – View of the intermediate posts at the tack up stage

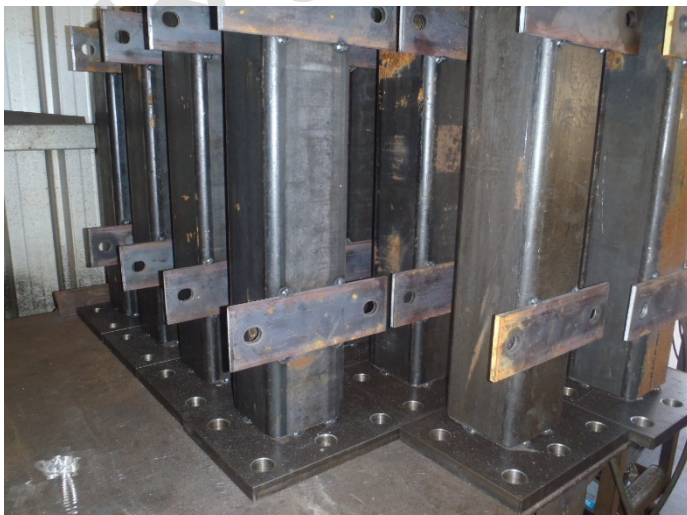


Figure 2 – View of the butt weld preparation on the intermediate posts



Figure 3 – View of the correct root gap between the base plate and post interface



Figure 4 – View of the complete posts



Figure 5 – Fillet weld leg length is the correct size



Figure 6 – Fillet weld throat thickness is the correct size



Figure 7 – Fillet weld leg length is the correct size



Figure 8 – View of the post identification mark on the base plate



Figure 9 – View of the weld splatter in the base plate holes



