Submission 40 - Welding Technology Institute of Australia

The Welding Technology Institute of Australia made submission 32 to the inquiry into the Future of Australia's steel industry in the 44th Parliament.

This document is intended as a supplementary submission to the original submission 32.

All submissions received in the 44th Parliament can be accessed via the following link:
http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Economics/Australias_Steel_Industry/Submissions

25 September 2016

SUPPLEMENTARY SUBMISSION TO THE SENATE INQUIRY INTO: THE FUTURE OF AUSTRALIA'S STEEL INDUSTRY

POLICY PROPOSAL: SAFETY OF FABRICATED STRUCTURAL STEEL

Annex A: About Welding Technology Institute of Australia (WTIA)
Annex B: Case Studies

1. Introduction

Since the Institute's initial submission to the inquiry dated 15 February, 2016 and subsequent appearance before the committee, further information has come to light we believe warrants this supplementary submission.

2. Executive Summary

When fabricated structural steel is inspected as much as 80%, predominantly imported structures, is found to be non-compliant with Australian standards. In many cases asset owners or contractors in this situation refuse to accept responsibility for rectifying the structure opting instead to take the risk or try and pass on liability to another part of the supply chain. The resulting merry go round is not only a significant cost to the economy it often remains unresolved leaving an unsafe structure in place.

Furthermore, the WTIA has recently discovered that there is no regulation covering the manufacture and roadworthiness of towed vehicles [caravans; domestic trailers; commercial trailers; boat trailers]. In particular the structural welds used to build the underpinning steel chassis do not comply with the relevant Australian standards and the Welders making those welds are not qualified or certified to do so.

The WTIA is deeply concerned that both these issues pose a threat to public safety which could lead to loss of life. Whilst the number of reported incidents caused by the failure of fabricated structural steel are few, the risk of a fatality increases every year. From empirical evidence we note that many towed vehicles require structural repair within 5 years of their manufacture. The WTIA is committed to ensuring that no Australian lives are lost through an accident caused by non-compliant welding without causing an undue regulatory burden on industry.

It is proposed that regulation is introduced to ensure that all fabricated steel manufactured locally or imported in Australia is fit for purpose by subjecting it to conformity assessment. The WTIA is prepared to ensure compliance to the proposed regulation by introducing a risk-based industry managed scheme through a suitably accredited third party compliance organisation.

The EU has now introduced the most comprehensive (CE Mark) regulatory framework anywhere in the world covering all fabricated steel products. This is an extremely effective scheme but the small size of the Australian market would make implementing it here unrealistic. The strength of the WTIA proposal is that it will have a much lighter touch by simply codifying existing best practice in terms of pre-execution inspections and formalise responsibility for safety within the supply chain.

The WTIA is confident of industry support from asset owners and manufacturers as well as peak industry bodies.

3. Issues

Over the past three years the number of reports of unsafe steel structures received by the WTIA from its Certified Welding Inspectors has increased exponentially. The primary cause of the safety concerns has been welding which is not fit for purpose and does not comply with recognised international Standards.

Examples of unsafe structures include:

- pedestrian, road and rail bridges
- oil and gas industry safety structures
- welded steel beams used in the construction industry
- light poles and gantries used in road infrastructure
- caravans; domestic and commercial trailers; boat trailers

Australian Standards are as good, if not better, than any in the world but very few are supported by regulation and are therefore only applied on a voluntary basis. Without any compulsion to manufacture or procure products to a recognised Standard companies take the lowest cost option which is often detrimental to public safety. When product is inspected and found to be non-compliant many refuse to accept responsibility for rectifying the structure opting instead to take the risk or try and pass on liability to another part of the supply chain. The resulting merry go round is not only a significant cost to the economy it often remains unresolved leaving an unsafe structure in place.

4. Impact on Public Safety

The WTIA is deeply concerned that this issue poses a threat to public safety which could lead to significant loss of life. This could be through a bridge failure; collapse of a light pole; or structural failure of a trailer chassis.

'On October 21, 1994 the Seongsu Bridge over the Han River in Seoul, South Korea collapsed through structural failure caused by improper welding of the steel trusses; 32 people died and 17 were injured in the accident.'

'There is evidence that there is a potential immediate safety risk to the public in the use of these structures (Busselton Pedestrian Bridges) and this will increase in time as the durability factors come to bear.'

'On June 9, 2015 a light pole crashed over a footpath on the Anzac Bridge in Sydney. No one was killed but as a witness stated: 'if it had fallen on the road it could have been an incredible accident'.

'As a result of a recent accident involving a quad axle dog trailer manufactured by XXX Trailers in Brisbane, the trailer drawbar became detached from the trailer frame. …There were indications of ineffective and sub-standard welding procedures carried out to the drawbar assembly.'

5. Objective

The WTIA is committed to ensuring that no Australian lives are lost through an accident caused by non-compliant welding without causing an undue regulatory burden on industry.

6. Proposal

It is proposed that regulation is introduced to ensure that all fabricated structural steel commissioned or manufactured in Australia in is fit for purpose by subjecting it to conformity assessment. Once the inspection is complete a compliance certificate will be issued and lodged on a national database.

Our proposal covers the following:

- Construction Categories 2 (Medium Risk Structures) & 3 (High Risk Structures (as defined in As5131 *Steel Erection*)
- All towed trailers manufactured to AS/ANZ1554

Appreciative of the Commonwealth's policy of reducing the regulatory burden on industry such regulation will have a light touch by simply codifying existing best practice. However, it will provide significant benefit to the community by providing a transparent, auditable system and clearly define where responsibility lies within the steel supply chain.

WTIA considers that this proposal will significantly reduce the risk to the Australian public.

7. Compliance Scheme

The WTIA is prepared to ensure compliance to the proposed regulation by introducing a risk-based industry managed scheme through a suitably accredited third party compliance organisation. The scheme will be accredited to *ISO17024 Conformity Assessment*, comply with the WTO TBT Agreement and, where practical, adopt the ISO/UNIDO Conformity Assessment Toolbox *'Building Trust'*.Current Australian Voluntary Compliance Framework

Currently steel fabricated in Australia will normally comply with the appropriate standards either on a voluntary basis or as specified in contract terms and conditions. The WTIA has been certifying fabricators on a voluntary basis to a AS3834 *Welding Quality Management* since 2002.

Steel Compliance Australia launched a scheme in 2015 for certifying fabricators to AS5131 *Steel Erection* which has had some support from the South Australian government for publicly funded projects.

WTIA is not aware of any code covering the manufacture of trailers.

8. International Benchmarks

Under the EN1090-1 harmonised standard the EU has now introduced the most comprehensive (CE Mark) regulatory framework anywhere in the world covering construction products.

Under the Construction Products Regulation (CPR), new legal obligations have been placed on manufacturers, distributors and importers of construction products used within the EU to CE Mark their products, where they are covered by either a harmonised standard or European Technical Assessment (ETA). This applies to constituent products (such as steel beams, bolts etc) and to fabricated elements and systems made from both CE Marked and non-CE marked products.

The CPR required the CE Marking of all construction products from 1 July 2013 and the CE Marking of fabricated structural steelwork from 1 July 2014'.

All trailers are required to be CE marked and often require additional certification i.e. TUV.

This is an extremely effective scheme but WTIA considers that the small size of the Australian market and the size and diversity of overseas suppliers would make implementing the same scheme here unrealistic.

The strength of the WTIA proposal is that it will simply codify existing best practice in terms of pre-execution inspections and formalise responsibility for safety within the supply chain.

9. Industry Impact

It is estimated that over 90% of steel structures fabricated in Australia complies with Australian standards and that a significant proportion is subject to independent inspection during manufacture, at completion and prior to commissioning. Nevertheless, all fabricated steel made in Australia will require a compliance certificate. However, existing practices mean that this is unlikely to prove a significant additional burden to industry.

Fabricated steel procured from overseas manufacturers certified to *ISO3834 Welding Quality Management* and employing suitably qualified welders will have no difficulty passing a conformity assessment and obtaining a compliance certificate. Conformity assessment may take place at the country of origin or in Australia by a certified inspector or engineer.

Asset owners or prime contractors procuring fabricated steel from overseas companies not appropriately certified will take the risk of failing a conformity assessment and having to arrange for rectification work to take place in order to receive a compliance certificate prior to commissioning.

Trailers appear not to be manufactured to the relevant Australian standard and not certified as safe before sale. WTIA is already embarking on a industry education program to remedy this situation but regulatory support will be required.

10. Industry Support

This policy has the full support of the WTIA membership which includes major power, mining and infrastructure companies.

The WTIA is confident this proposal will receive the backing of the key asset managers through AusRoads and WTIA Power, Defence, and Mining technology groups.

The following peak bodies have expressed their in principle support:

- Australian Industry Group
- Australian Institute of Non-destructive Testing
- Australian Galvanisers Association
- Australian Corrosion Association
- Australian Steel Institute
- Bureau of Steel Manufacturers
- Institution of Engineers Australia

Yours faithfully,

Geoff Crittenden
Chief Executive

Annex A: About Welding Technology Institute of Australia (WTIA)

1. Welding Technology Institute of Australia

The Welding Technology Institute of Australia (WTIA) is the peak industry body representing the welding industry in Australia. Its members consist of individual welding tradesmen, professional engineers, academics and companies. WTIA members are involved in almost every facet of Australian industry and make a significant contribution to steel fabrication worth $6.6 billion annually.

Representing Australia in the International Institute of Welding (IIW) the WTIA is the Authorised Nominated Body (ANB) for the certification of welders and welding companies in Australia. This body currently certifies:

- IIW qualified welding inspectors, specialist, technologists and engineers
- WTIA qualified welders and supervisors to ISO 9606 (Welder Qualification), AS1796 (Pressure Vessel Welding) and AS1554 (Structural Steel Welding)
- IIW assessed welding companies to AS3834 (Welding Quality Management)

2. Policy Platform

The WTIA's policy platform is based around three tenets:

a. Public Safety

The WTIA is responsible for protecting public safety by certifying that welders and welding companies comply with international best practice.

b. Industry Competitiveness.

Through its training courses, international networks and technology transfer activities the WTIA is proactively increasing the international competitiveness of the Australian welding industry.

c. Innovation.

Historically the WTIA has facilitated significant investment in welding research. Currently it is identifying funding for three major initiatives in support of the Commonwealth defence shipbuilding program:

- robotic welding and laser inspection in confined spaces
- additive manufacturing using filler wire technology
- carbon fibre – metal joining in a marine environment

Annex B: Case Studies

Case Studies: Executive Summary

Busselton Footbridges.

This case study concerns three pedestrian bridges in the Busselton area which were procured from China by Local Government through a design & construct process. One bridge is of particular concern as it runs over a waterway between two schools. Inspection by engineers from the Australian Steel Institute, Welding Technology Institute and Galvanisers Association concluded:
'There is evidence that there is a potential immediate safety risk to the public in the use of these structures and this will increase in time as the durability factors come to bear.'

Despite this issue being reported to the local government bodies concerned and the West Australian Government no action has been taken.

Full Report: Appendix 1

Penrith Bridge.

This bridge was procured from Vietnam by Penrith Council through a local fabricator. It has a 62m span and supports a glass sound barrier for a New South Wales housing estate project. After construction inspection showed significant defects, including almost double the design deflection, requiring significant rectification. However, the rectification work was deemed insufficient to stabilise the structure and a local fabricator was retained to rebuild the bridge.

The structure was non-compliant to Australian standards specified by the engineer including AS1554 welding and material specification AS1163. When the structure was cut up for scrap it was discovered that the primary load bearing hollow sections were of an inferior load bearing capacity and had been filled with water to mask the weight differential.

Full Report: Appendix 2

TEFCO Trailer Draw Bar Failure

As a result of an accident involving a quad axle dog trailer manufactured by TEFCO Trailers in Brisbane, the trailer drawbar became detached from the trailer frame. The matter was investigated by Queensland Transport who found there were indications of ineffective and sub-standard welding procedures carried out to the drawbar assembly.

Full Report: Appendix 4

AUSTRALIAN STEEL INSTITUTE

Notification from the Australian Steel Institute

Busselton Bridges Examination.

The Australian Steel Institute (ASI) has been contacted by its members about serious concerns of Non-Compliant Product associated with the Busselton Council Bridges project.

The summary findings of the ASI are as follows

1. Based on information provided by ASI fabricator and engineering members, The Welding Technology Institute of Australia (WTIA) and the Galvanizers Association of Australia (GAA) in reports provided to us we believe that the Bridges project shows serious evidence of non-compliant product (NCP).This is based on our knowledge of good practice as defined by our Standards framework and our understanding of the design requirements.
2. The evidence of NCP is serious and affects the structural integrity and durability of the structures. We have included in Appendix A a summary of these aspects with particular reference to the reports from the WTIA and GAA.
3. ***There is evidence that there is a potentialimmediate safety risk to the public in the use of these structures and this will increase in time as the durability factors come to bear.***
4. In this type of construction there is a duty of care for the supplier, builder, the engineer and council and it is of the opinion of the ASI that this project is a prime example of where the link between poor and non-compliant workmanship can be directly related to the potential for a safety incident.

The ASI is also concerned that this project shows to the Busselton community that the council will accept substandard product and the message this conveys for other construction projects.

In particular the council is demonstrating that it has double standards regarding the WA manufacturing community, that it is prepared to accept product that clearly does not meet the required Australian Standards on a critical structure from suppliers overseas whereas local suppliers are required to fully satisfy all the requirements of the Australian standards.

Signed. David Ryan

National Manager ASI

Chair of Steelwork Compliance Australia

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Appendix A

Summary of non-compliant aspects based on WTIA and GAA reports

The non-compliances indicated from the WTIA and GAA reports may be summarized into three fundamental areas:

1. **Very poor welding practice:** There are numerous instances of lack of weld finishing (surface lumpiness, weld spatter, porosity etc.) which create pits and crevices and will lead to early rusting and durability and maintenance issues well ahead of any rationally planned schedule. This has implications for excessive maintenance costs that will ultimately be borne by the community. More significantly, the lack of quality leads to serious concerns about the weld strength and structure capacity (see point 3).
2. **Very poor galvanising practice:** To some extent the illustrated galvanizing non-compliances in the WTIA report are a function of attempting to galvanize over the top of poor unfinished welds. However, there are significant instances of poor practice, including oxy burning out of holes for venting (figs 54, 55, 65, 66), weld blow out issues (figs 9, 30, 31) and bare areas (figs 12 to 14). All of these will result in increased maintenance costs and most are not consistent with accepted practice as defined in the relevant Standards. Many instances of rusted areas already present after only a short time in service speak to the ongoing significant maintenance issues.
3. **Structural issues:** There are a number of potential structural issues that may affect the strength and safety of the bridges illustrated from both reports, including:
   - the poor quality of the welding brings into question the actual capacity of the welds, which most engineers would expect to be 100% over their full length. There are indications from the figures that a number of the welds contain imperfections (for example, Figs 89 to 92 in the GAA report show welds that appear to have been ground back revealing voids) which can significantly reduce capacity. These are only the ones that have been revealed. Full examination of the welds would need to be undertaken using ultrasonic techniques or similar to ascertain the level of imperfections in any of the welds. This is why welding is considered a 'special process' in Standards and puts heavy reliance on managing the process to get compliant and safe outcomes. Given the evident and demonstrable weld quality issues, it is difficult to imagine how an engineer might be in a position to properly assess the weld capacity without all welds being tested over 100% of their length.
   - instances of excessive slotting of bolt holes (Figs 38, 75, 102, 103, 147 in GAA report) without the larger plate washers required by our design Standard AS 4100 also bring into question the capacity of the connection to resist load in the direction of the hole slotting. The engineer needs to ascertain this.
   - instances of misalignment of members (figs 10, 27, 28, 76 to 78 in GAA report) need to be assessed by the engineer in respect of the member design capacities and the requirements in AS 4100 on fabrication and erection tolerances. These could easily degrade the structural capacity.

- Figure 74 in the GAA report appears to show a bolted connection with a substantial gap between the connected plates. Unless packed properly, this is non-compliant to AS 4100 and would likely degrade the connection capacity significantly.
– Figure 33 in the GAA report shows what appears to be a crack over the full length of the weld. If it is a crack, this is very serious, as it suggests that the weld in that area is obviously totally ineffective in taking load.

Dr Peter Key

National Technical Development Manager

Australian Steel Institute

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Australian Steel Institute (ASI)

Bussellton Pedestrian Bridges
Visual Examination and Commentary Regarding Weld Quality >

COMPILED BY:	REVIEWED BY:	APPROVED BY:
Bruce Ham		

Introduction:

Visual examination was carried in August 2015 of three bridges known as the Buayanup Drain Bridge; the Toby Inlet Bridge and the Vasse Diversion Drain Bridge to make comment regarding the weld quality. Photographs of the bridges including the welds were also provided for review.

The three bridges were all constructed from steel hollow section and therefore in accordance with AS4100-1998 clause 11.1.5 and Table 11.5.1(4), welding of these sections “shall conform with Category SP as defined in AS/NZS 1554.1”. The thickness of the hollow section members was not measured, although “hammer testing’ indicated that they were less than 5mm.

Visual examination found that many of the welds were not compliant with the permissible levels of imperfections for Category SP welds as defined in AS/NZS 1554.1 Table 6.2.2. Note; during the actual inspection of the bridges – the components and welds had been completed and galvanised thereby concealing other features that could provide an indication of weld quality.

The weld joint profile evident of a number of weld types also indicated that non-standard joint preparations and welding practices had been used. A number of welds were excessive for the relatively thickness steel sections and excessive welding is known to be a potential origin of defects that can greatly affect the integrity and life of the weld. This begs the question therefore as to whether there was use of qualified welding procedures, supervisors and welders during fabrication and therefore in regard to the overall quality of the fabrication..

Summary of Findings

The following photographs are from the bridges and show examples of poor welding practices.The comments are based on visual examination of the bridges and also from digital images provided. Comments are of a general nature.

1.1 Toby Inlet Bridge

- **Weld Imperfections Evident**
  - Weld is excessive in size and a round bar approximately 16mm in diameter appears to have been used as filler within the weld.
  -

Weld imperfections evident

- Weld size is excessive – cap is over 30mm wide indicating that fit up may not have been in accordance with the standard.

Welds joining similar joints varied substantially in size and quality. Overroll, Undercut, Incorrect bead shape, Excessive size and porosity were evident.

P1010070

Weld imperfections evident

- Lack of fusion
- Overroll

- Porosity
- Incorrect bead shape

P1010070

Weld imperfections evident

- Misalignment
- Incorrect bead shape

The weld has been excessively ground and the extent of the welded zone is not clear. The weld shape is consistent with a joint that had very poor fit up.

P1010117

Weld imperfections evident

- Porosity
- Incorrect bead shape
- Plate edges on the gusset plates have been poorly profiled and have a poor surface finish

P1010119

Weld imperfections evident

- Lack of fusion
- Overroll
- Undercut
- Excessive spatter not removed before galvanizing

- **Buayanup Drain Bridge**

P1010020

- **Weld imperfections evident**
  - Incomplete welding at the gusset corner and around the end of the gusset
  - Overroll
  - Porosity
  - Incorrect bead shape

P1010051

- **Weld imperfections evident**
  - Overroll

P1010059

- **Weld imperfections evident**
  - Overroll
  - Porosity and wormholes

1.2 Vasse Diversion Drain Bridge

P1010163

- **Weld imperfections evident**
  - Lack of fusion
  - Overroll
  - Porosity
  - Incorrect bead shape

P1010166

- **Weld imperfections evident**
  - Excessive grinding
  - Incorrect bead shape

P1010167

- **Weld imperfections evident**
  - Slag inclusions
  - Lack of fusion
  - Overroll
  - Porosity
  - Slag not removed
  - Incorrect bead shape

P1010168

- **Weld imperfections evident**
  - Slag inclusions
  - Lack of fusion
  - Overroll
  - Porosity
  - Slag not removed
  - Incorrect bead shape

P1010172

- **Weld imperfections evident**
  - Slag inclusions
  - Lack of fusion
  - Overroll
  - Slag not removed
  - Porosity
  - Incorrect bead shape

P1010175

- **Weld imperfections evident**
  - Lack of fusion
  - Overroll
  - Porosity
  - Incorrect bead shape

1.3 Busselton Bridges

IMG_005

- **Weld imperfections evident**
  - Slag inclusion
  - Porosity

IMG_0029

- **Weld imperfections evident**
  - Incorrect bead shape
  - Poorly finished flame cut edge

IMG_0060

- **Weld imperfections evident**
  - Incorrect bead shape
  - Vent holes located incorrectly intersecting weld zone
  - 4th bolt hole?

IMG_0064

- **Weld imperfections evident**
  - Lack of fusion
  - Overroll
  - Porosity
  - Incorrect bead shape

IMG_0070

- **Weld imperfections evident**
  - Bottom of baseplate has had material removed by oxy-fuel gas cutting
  - The surfaces are as cut and undressed
  - Surfaces are unsuitable for galvanizing

IMG_0077

- **Weld imperfections evident**
  - Variable fillet sizes

AUSTRALIAN STEEL INSTITUTE

WTIA
Welding Technology Institute of Australia

Report by the Australian Steel Institute

on the compliance requirements for delivery

of the structural steel component for projects.

Report on non-compliant imported steel fabrication for a glass sound barrier bridge truss for a NSW Housing Estate Project.

Project: A glass acoustic noise barrier alongside a roadway, comprising a 62m span triangular tubular truss fabricated from up to 250mm SHS members.

Project Views:

Background:

The truss structure shown below was tendered locally but fabricated overseas and imported against this contract. The fabricator responsible for importation of the truss structure went into insolvency. The construction illustrated significant defects and deflected after erection requiring rectification. The builder undertook significant repairs on site, including reinforcing the areas where cracking occurred in the junction between cross beams and main truss beams and welding reinforcing tubing alongside sections of the cross beams that had split.

Overall view of the structure

Defects and rectification works:

Photo 1 Showing site rectification of split join of main and cross cords of the truss

Photo 2 Showing site rectification of the split cross cord of the truss. Tubing was welded each side of the split section.

This rectification work was deemed insufficient to stabilise the structure and as a result one of the local tenderers was engaged to rebuild the structure.

In this process the original imported steelwork was removed and taken to the fabricators yard. Several additional defects and instances of non-compliance to the relevant Standards were found.

Photo 3 30mm holes were drilled to take 20 mm bolts. This is non-compliant

Photo 4 It is thought that the connecting chords to this beam were cut too short, requiring spacers to be inserted at each join – poor workmanship

Photo 5 The diagonal chords when cut were found to be filled with water. This is extremely unusual and is thought possibly to have been deliberate to build up the weight of the structure to have a mass within overall specification.

Photo 6 Bottom chords showing bending

Photo 7 Elongated holes to allow fit up and create potential for movement and slop.

Holes are approx. 28mm diameter for 20mm bolts

Photo 8 Poor paint finish against a specification of 75um inorganic zinc silicate, 125um Epoxy and 75um urethane

Photos 9 and 10 Poor paint finish

Photos 11- 14 Cracking across the section

Photo 15 Very poor seam welding or rectification of an unwelded section

Photo 16 and 17 Poor scarfing of the weld including undercut with potential to be below the wall thickness specification.

Photo 18 Fillet welds instead of full penetration butt weld

Photo 19 Use of a sleeve instead of a full penetration butt weld as specified

Photo 20 – 23 Under cut on weld profiles

Steel work has been tested and analysed by ALS NATA certified laboratory

Tensile testing showed the steel was 338 MPa yield strength versus a 450 MPa grade to AS/NZS 1163 Gr 450L0 called up in the engineers documentation.

Extract:

COMPLIANCE STATEMENT: The tensile test results reported herein **fails to comply** with the requirements specified in Table 6 of the AS/NZS 1163: 2009 for Grade C450L0.
CVN impact test results reported herein **comply** with the requirements specified in Table 7 of the AS/NZS 1163: 2009 for Grade C450L0.

Paint coating has been tested and analysed By CTI Consultants;

Extract:

4.1 Original Paint System
The original paint system does not comply with the specified system, in that:-
• It consists of only the first 2 specified paints and is missing the specified polyurethane finish
• The dry film thickness is highly variable with areas of DFT below the 20% tolerance level allowed by AS 3894.3.
• Instances of poor workmanship exist resulting in inadequate film formation at edges of SHS members.
Furthermore, there are minor residual fabrication defects associated with the original welds, in contradiction with the recommendations given in AS/NZS 2312.
4.2 Paint Rectification
Extensive rectification or strengthening works were performed in the truss after the original paint system had been completed.
The coating of these repairs was of a poor standard, and breaches the specification and industry standards because:-
• Numerous fabrication defects remain, including weld crests, weld spatter and weld porosity
• The touch-up coating system consists only of a thin coat of aluminium-pigmented paint and a grey finish coat (possibly polyurethane) for a total DFT of 75-125µm
• The cutting back and feathering of the original paint at rectification welds was inadequate resulting in corrosion at the edge of the fractured original paint.
• The repair was applied over possible contamination or deteriorated existing paint.

Summary:

This project was put out to tender and the winning tender (lowest price) was based on imported fabricated steelwork.

The ultimate cost difference between local and imported fabricated steel was thought to be in the order of $100,000.

The truss deflected on installation and initially on-site rectification was attempted but was unsuccessful. The project is now being rebuilt by an Australian Fabricator to largely the same design but with compliant materials and workmanship.

The rectification and rebuild costs are thought to be in the order of $810,000

Conclusion:

This imported structure was found to be non-compliant to the Australian Standards specified by the engineer. This covers AS/NZS 1554 welding and the material specification AS/NZS 1163 for the hollow sections. The paint specification was proprietary as the AS/NZS 2312 specification is currently not normative. Some aspects of fabricator workmanship is covered in the Australian Steel Institute' Fabricator Code of Practice' soon to become AS/NZS 5131. In this case, we are informed the ultimate responsibility was sheeted home to the engineer by the builder and the cost was borne by the engineers insurance.

The ASI is often approached by engineers and builders on advice regarding steelwork compliance documentation and where appropriate will offer this as a service.

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Vehicle Standards Instruction

Queensland Government

Queensland **Transport**

DRAWBAR FAILURE ON A DOG TRAILER MANUFACTURED BY TEFCO TRAILERS (QLD) PTY LTD

Trailer
Inspection

Number T 6.0
Issue Date 30 June 2006
Revision Date

Intended audience	**Transport Inspectors:** Provides sufficient guidance to enable thorough and consistent inspection of drawbars attached to affected dog trailers manufactured by Tefco Trailers. **Truck operators:** Establishes sufficient guidance for the safe operation of drawbars attached to dog trailers manufactured by Tefco Trailers.
Applies to	All trailer drawbars attached to dog trailers manufactured by Tefco Trailers (Qld) Pty Ltd of 24 – 26 Alexandra Place, Murrarie Qld 4172.
Objective	To ensure that dog trailers manufactured by Tefco Trailers (Qld) Pty Ltd. do not have cracking or other defects in the trailer drawbar.
Background	As a result of a recent accident involving a quad axle dog trailer manufactured by Tefco Trailers in Brisbane, the trailer drawbar became detached from the trailer frame. The matter has been forwarded to the federal Department of Transport and Regional Services (DoTaRS) for their consideration of a recall of these affected trailers or other action considered necessary.
Legislation	*Transport Operations (Road Use Management - Vehicle Standards and Safety) Regulation 1999* - s 5. 'Vehicles must comply with vehicle standards". Lists when a vehicle is not in a condition for use on a road.
Issue specifics	The following details were observed at the time of inspection of the trailer involved in the accident by officers of Queensland Transport: • The drawbar assembly was manufactured from 89 x 89 x 6mm square steel tubing; • There were indications adjacent to the tow coupling unit that the drawbar had been jack-knifed as a result of excessive angles of operation. As a result, markings were evident on the towbar tongue base plate with cracking also evident where the drawbar attached to the towbar tongue base plate; and

- There were indications of ineffective and sub-standard welding procedures carried out to the drawbar assembly

A representative of Tefco Trailers at Murrarie in Brisbane has indicated that this was the first dog trailer drawbar that the company has had problems with. He also indicated that the trailer had been jack-knifed as indicated by the marking on the drawbar tongue base plate. It was also indicated that, in his opinion, this jack-knifing had probably caused cracking in adjacent areas of the drawbar assembly.

It was also stated that a large number of these quad axle trailers (in excess of 100 units) had been made by this company.

A discarded drawbar unit off another vehicle was also viewed on the premises and this drawbar also had similar markings and cracking evident.

It was suggested that a recall should be carried out on these trailers to check for cracking in the drawbar assembly. Tefco Trailers are in the process of forwarding a letter to all known operators to whom these units had been sold since production requesting immediate action be taken to have the drawbars checked for cracks and other possible defects in the drawbar assembly.

Tefco Trailers have also implemented additional checking and production procedures in the manufacturing process to ensure adequate welding had been applied during construction of the drawbar assembly for these types of trailers.

DoTaRS have indicated that they are in agreement with this action by Tefco Trailers.

Inspector's action

When inspecting any dog trailer drawbars manufactured by Tefco Trailers, pay close attention for cracking and ineffective welding procedures in all sections of the drawbar assembly and associated attachment points. To ensure a thorough inspection of the affected areas are possible, removal of excessive dirt and foreign matter may be required.

If cracks, ineffective welding or insecure components are found, issue a Defect Notice directing the operator to:

- Withdraw the vehicle from service immediately; and
- Have necessary repairs carried out to the affected area(s) or replace the drawbar assembly.

Truck operator's action

Ensure any dog trailer drawbars manufactured by Tefco Trailers are checked for cracking and ineffective welding in all sections of the drawbar assembly and associated attachment points. To ensure a thorough inspection of the affected areas are possible, removal of excessive dirt and foreign matter may be required.

If cracks, ineffective welding or insecure components are found:

- Withdraw the vehicle from service immediately; and
- Have necessary repairs carried out to the affected area(s) or replace the drawbar assembly.

Enquiries	Regional Senior Transport Inspectors or Land Transport and Safety Division - Policy Advice Team on (07) 3253 4851.
Authorisation	Issued by Business Manager (Policy Advice).