

NEW EQUIPMENT & SYSTEM APPROVAL PROFORMA

Ref: 14/13456

Note: the prompts given below are only a guide to the information required for approval. Dependent on the type of equipment or system that requires approval delete any section that is not applicable or include additional information if necessary. **Mandatory** fields are marked with an asterisk (*).

1	Equipment or System to be approved * Martinus Rail Hollow Steel Inbearer MKII
2	Originator * Name: Mark Fulford (mark@martinusrail.com.au) Company: Martinus Rail
3	Introduction * Martinus Rail (MR) have designed, tested and manufactured a hollow steel inbearer suitable for use with all turnout assemblies and Siemens (Invensys Rail) M3A, M23A and D84M points operation equipment. This hollow bearer has been designed in collaboration with Siemens.
4	Determination of Need * The MR hollow steel inbearer has been jointly developed with Siemens to overcome current maintenance issues with existing hollow steel inbearers. The MKII revision has incorporated the following design improvements since the previous MR hollow steel inbearer design (Ref 13/16206): <ul style="list-style-type: none">• Increased tamping space between bearers for machine tamping.• Increased access in the bearers for maintenance and installation of rodding components.• Same depth as standard concrete turnout bearers so tamping machines do not need depth changes• Uniform design to suit interchangeability.• Ballast locking ribs have been moved from the bearer edge to allow increased tyne clearance under the bearer. Key design points for the MR hollow steel inbearer MKII are: <ul style="list-style-type: none">• Improved maintenance access for track workers for rodding adjustment• Machine tampable<ul style="list-style-type: none">◦ Same depth as standard concrete bearers for easier machine tamping• Designed for 35 TAL• Expected life span to exceed 1000MGT• Increased strength and life• Suitable for all ARTC network axle loads and speeds (HV currently 30TAL @ 80km/hr)• Designed to suit existing points operation machines M3A, M23A and D84M• Designed to suit existing points rodding configurations: conventional/lost motion, clawlock & spherolock• Suitable for front drive, back drive, SNX drive, bell cranks
5	Significant Change or Not (as determined by the Manager Standards) * This change in equipment or system is assessed as MINOR
6	Review Panel (as determined by the Manager Standards) * <ul style="list-style-type: none">• John Furness - Manager Standards• Gunaratnam Jayakumar – Manager Infrastructure and Planning• Greg Riches – Development Manager (Heavy Haul), Hunter Valley• Mark Blaik – Senior Signal and Systems Engineer• Jess Tai – Track Engineer
7	Safety The design of the hollow steel inbearer complies with the following ARTC specifications: <ul style="list-style-type: none">• ETA-03-03 Technical Specification for Manufacture of Components for Points and Crossing Structures• Section 3 – Points and Crossings – CoP Section• SDS-14 – Signalling – Points The design of the hollow steel inbearer references information from the following specifications: <ul style="list-style-type: none">• AS 1085.14 Prestressed concrete sleepers

- AS 1085.17 Steel sleepers
- AS 1085.19 Resilient fastening assemblies
- RailCorp SPC 233 Concrete turnout bearers
- ARTC CoP Section 2 Sleepers and fastenings
- EN 13230-1 Concrete sleepers and bearers Part 1: General requirements
- EN 13146-3 Railway applications – Track; Test methods for fastening systems; Part 3: Determination of attenuation of impact loads
- EN 13146-4 Railway applications – Track; Test methods for fastening systems; Part 4: Effect of repeated loading
- EN 13146-5 Railway applications – Track; Test methods for fastening systems: Part 5: Determination of electrical restraint

Refer to attached risk assessment document 12-1510 – Risk Assessment – V1.0

8 Performance and Suitability

The MR hollow inbearer MKII has been FEA tested to have an expected life span to exceed 1000MGT. Please refer to the attached:

- Assessment of strength and service life of the 350mm Martinus Rail Trough Bearer for use in ARTC Mainline Track
- 3rd Party Verification of Martinus Rail Trough Bearer Design – Mk II (by Roger Wyatt)

The MR hollow inbearer MKII are to be used with AS60 stockrail and switches only and support the following loadings on the mainline:

- 35 TAL @ 80km/hr
- 25 TAL @ 115km/hr
- 20 TAL @ 160km/hr

Please refer to the following drawings for Assembly and Welding details:

- MR-96000-1.3: Standard Gauge Hollow Steel Points Bearer
- MR-96040-1.3: SG 350 Wide Backdrive Hollow Bearer
- MR-96060-1.3: SG 350 Wide SNX Hollow Bearer

(i) Use in other rail networks

The MKII hollow steel inbearer is comparable to other products on the market and therefore is not new technology.

(ii) Use in the ARTC network

This design is an improved version of the Martinus Rail MKI hollow steel inbearer that is installed at Watermark in the Hunter Valley (Type Approval Ref: 13/16206).

(iii) Issues arising from usage of the equipment/system

Covers are available for installation to exclude foreign objects.

(iv) Changes required to infrastructure or systems for use of the equipment

Item numbers will need to be added to the system.

9 Reliability

Martinus Rail is a proven supplier of high quality turnouts, S&C components and interlocking. This design has been tested using Finite Element Analysis (FEA) to prove lifecycle and suitability for use in all ARTC rail networks including HV 200+ HAL.

10 Maintainability

Martinus Rail hollow steel inbearers MKII are compatible with current ARTC maintenance regimes.

This design is compatible with the Plasser Unimat and Split Head machines only to achieve full consolidation of ballast.

11	Approval *	<p>This type approval covers Martinus Rail steel hollow inbearers MKII suitable for use with all turnout assemblies and Siemens M3A, M23A, and D84M points operation equipment.</p> <p>These hollow steel inbearers are suitable for all current axle loads and speeds used on the ARTC network and are approved for use on the entire ARTC network including the Hunter Valley region (HAL).</p>					
12	Is the supplier accredited to ISO 9001 specifically for this product? * Martinus Rail is accredited for the research, development, design and supply chain management of railway products (certificate No. QEC29920).	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>		
13	Conditions of Approval * <ol style="list-style-type: none"> 1. To be installed and maintained as per manufacturer's instructions. 2. Martinus Rail to provide instruction to maintenance personnel on the inspection and maintenance of the inbearers, including provision of documentation and a site demonstration, prior to the commissioning of the inbearers. 3. Ellipse shall be updated with the required inspection requirements per EGP-03-02. 4. Protective covers for inbearers are to be installed <u>prior</u> to commissioning to exclude foreign objects. 5. For use with tangential turnout assemblies and Siemens M3A, M23A and D84M points operation equipment only. 6. Only to be installed in track in good support condition e.g. good drainage, ballast depth, ballast shoulder, well compacted. 7. Not to be placed under IRJ or dipped or badly corrugated rail. 8. To be tamped using a Plasser Unimat or Split Head machine only. 9. A report is to be submitted by Martinus Rail to the standards section detailing the performance of the inbearers which are to be installed as part of the Hexham Relief Roads project. Performance reports are to be submitted 12 months after commissioning of the turnouts. 						
14	Does the Originator accept the additional Conditions of Approval as set by the Review Panel:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>

15	Sign off	<i>ARTC office use only</i>
Review Panel:		
	On File	Date: 26 May 2014
John Furness	On File	Date: 27 May 2014
Gunaratnam Jayakumar	On File	Date: 27 May 2014
Greg Riches	On File	Date: 27 May 2014
Mark Blaik	On File	Date: 27 May 2014
Jess Tai	On File	Date: 30 May 2014