NEW EQUIPMENT & SYSTEM APPROVAL PROFORMA

Ref: *13/16206*

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 – for Watermark only

2 **Originator** *

Name: Mark Fulford Company: Martinus Rail

3 **Introduction** *

Martinus Rail have designed, tested and manufactured a hollow steel inbearer suitable for use with tangential turnout assemblies and Invensys Rail M3A, M23A and D84M points operation equipment. This hollow bearer has been designed in collaboration with Invensys Rail.

4 **Determination of Need** *

The hollow steel inbearer has been jointly developed with Invensys Rail to overcome issues with current maintenance issues with existing hollow steel inbearers. Key design points for the MR hollow steel inbearer are:

- Improved maintenance access for track workers for rodding adjustment
- Layout to be designed around standard track tamping machines to make inbearers fully machine tampable
- Increased strength and life
- Suitable for all ARTC network axle loads and speeds (Hunter Valley 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)* *

- John Furness - Manager Standards
- Gunaratnam Jayakumar – Manager Infrastructure and Planning
- Greg Riches – Delivery Manager, Hunter Valley
- Mark Blaik – Senior Signal and Systems Engineer
- Clinton Crump – Heavy Haul Development Manager, Hunter Valley
- Denis Snowden – WHS Coordinator
- Jess Tai – Track Engineer

7 **Safety**

The design of the hollow steel inbearer complies with the following ARTC specifications

- ~~ETA-03-02 New Turnouts and Diamonds~~
- ETA-03-03 Technical Specification
- Section 3 – Points and Crossings – CoP Section
- SDS-14 – Signalling – Points

The design of the hollow steel inbearer references information the following specifications:

- AS 1085.14 Prestressed concrete sleepers
- AS 1085.17 Steel sleepers
- AS 1085.19 Resilient fastening assemblies
- ARTC CoP Section 2 Sleepers and fastenings

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

8 **Performance and Suitability**

Please refer to attached drawings (MR-99106) for the layout of the hollow steel inbearer in a front drive arrangement with Invensys Rail M3A, M23A and D84M points operation equipment.

Please refer to attached drawing (MR-99101) for General Arrangement for Watermark.

Please refer to attached drawings (MR-99221 & MR-99444) for the design and manufacturing details of the frontdrive and backdrive hollow steel inbearer.

The Martinus hollow inbearers are to be used with AS60 stockrail and switches only and support the following loadings:

- 35TAL @ 80km/hr
- 25TAL @ 125km/hr
- 20TAL @ 160km/hr

Please refer to attached design specification for full performance and design criteria : 12-1510 - Hollow Bearer Specification V1.4

The Martinus hollow inbearers will exceed the tested life cycle of 400MGT, and it is expected that the life span will exceed 1,000MGT.

Please refer to attached:

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

(i) **Use in other rail networks**

This design of a hollow steel inbearer is a new product, however it is comparable to other products on the market and thus it is not new technology.

(ii) **Use in the ARTC network**

Similar inbearers have been approved by ARTC

- 08-08-11-035: Hollow Steel Sleeper for Wayside Equipment Installation
- 08-08-11-098: Steel Bearers for Siemens S700K & S700V Point Motor System

(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 life cycle and suitability for use in all ARTC rail networks including the HV 200+ HAL. Please refer to attached:

- Assessment of strength and service life of the Martinus Rail Trough Bearer for use in ARTC Mainline Track

3rd Party Verification of Martinus Rail Trough Bearer Design (by Roger Wyatt)

10 **Maintainability**

Martinus Rail hollow steel inbearers are compatible with current ARTC maintenance regimes. Maintenance manuals will be provided for ARTC intranet.

Martinus hollow inbearers are fully machine tampable, making them more readily maintainable than a standard points machine.

This design has been checked and verified by Plasser and Harsco – inbearers are fully machine tampable when using standard track tamping machines.

11 **Approval** *

Martinus Rail hollow steel inbearers suitable for use with tangential turnout assemblies and Invensys Rail M3A, M23A and D84M points operation equipment is approved for use at Watermark Only at this time.

12 **Conditions of Approval** *

1. To be installed at Watermark ONLY
2. Project team is required to report to Standards Department 1 month AND 6 months after commissioning on any problems regarding installation and performance.
3. In addition to the above condition, the project team is required to provide to the Standards Department

immediately following Commissioning:

a. A report on the suitability of all Makes and Model numbers of tampers that can be used with this equipment

AND

b. A report from the tamping Contractor on the tamping of these bearers during installation.

4. To be installed and maintained as per manufacturer's instructions.
5. Protective covers for inbearers are to be installed prior to commissioning to exclude foreign objects.
6. For use with tangential turnout assemblies and Invensys Rail M3A, M23A and D84M points operation equipment only.
7. Only to be installed in track in good support condition e.g. good drainage, ballast depth, ballast shoulder, well compacted.
8. Not to be placed under IRJ or dipped or badly corrugated rail.

13	**Does the Originator accept the additional Conditions of Approval as set by the Review Panel:**	Yes	☒	No	☐	N/A	☐

14	**Sign off**			*ARTC office use only*
	Review Panel:			
	John Furness	**On File**	Date:	**11 April 2013**
	Gunaratnam Jayakumar	**On File**	Date:	**11 April 2013**
	Greg Riches	**On File**	Date:	**11 April 2013**
	Mark Blaik	**On File**	Date:	**10 April 2013**
	Clinton Crump	**On File**	Date:	**11 April 2013**
	Denis Snowden	**On File**	Date:	**10 April 2013**
	Jess Tai	**On File**	Date:	**10 April 2013**