TECHNOLOGY MANAGEMENT

SITE SPECIFICATION

HOT BEARING EVALUATOR DETECTOR (HBED)

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Technology Management

Date: April 2018

Circulation Restricted To:

Transnet Freight Rail

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1. SCOPE

This specification provides a description of a suitable site to install and operate a Hot Bearing Evaluator Detector (HBED) as used by Transnet Freight Rail. This system is used to measure the temperature of the wheel bearings on railway vehicles especially wagons.

2. Reference Documents

(All the specification documents listed in the document shall be the latest version available on ProjectWise)

2.1 Signed Scope of Work (SOW) document issued by Technology Management 2.2Concrete sleeper drawings number: E3318_18_SHT1_AMD_3.
2.3 Typical rail drawings for 40kg, 48kg, 57kg & UIC60 or S60 kg rail.
2.4 Earth & lightning protection as per specification BBC 1040/BBB 3235.
2.5 Systems specification BBB 0493.
2.6 UPS specification BBC 5665.
2.7 Container specification BBF 1353.
2.8 Surge & Lightning protection requirements for trackside CAS equipment BBH 1091.

3. Site Requirements

**** SOW shall determine the power requirements.**

3.1 Power

3.1.1 The system shall run on standard mains which shall be provided within the field equipment room (single or 3 phase AC)

3.1.2 All earth cables, earth spikes & lightning protection shall be according to the Scope of Works document.

3.1.3 Uninterruptible Power Supply (UPS) 230V AC 600VA single phase for at least 4 hours.

3.2 Communication

There shall ideally be two communication channels available, a primary and a secondary channel to connect the HBED to the Integrated Train Condition Monitoring System (ITCMS).

The following communication mediums can be employed on site:

3.2.1 The HBED shall communicate using fibre optic protocol.
3.2.2 Radio communication equipment with Radio Modems.
3.2.3 Ethernet 10/100 network employing TCP/IP.

3.3 Physical site

3.1.1 The HBED site shall not be installed near a culvert.

3.1.2 The area next to the rails shall be levelled out and a suitable enclosure for the HBED equipment outside moving structure gauge.

3.1.3 This facility shall be easily accessible from public roads or from the Transnet Freight Rail service roads with standard vehicles.

3.1.4 The site shall preferably be in an area where there are no informal settlements or pedestrian traffic; this is an attempt to prevent vandalism and theft.

3.1.5 A vegetation clearance of at least 1.5 meters around this facility shall be adhered to at all times.

3.1.6 All equipment and cables shall be protected against theft/vandalism.

3.1.7 The system shall not be installed in areas that can influence (surge currents and EMI) the correct working of the HBED or other TFR systems, for example:

- Electrical sub-stations
- Neutral sections and phase breaks
- Bridges
- Signals

3.1.8 The HBED shall not be installed in a floodplain or poor drainage area

3.1.9 “A” board installation on both sides of the measurement site

3.1.10 Sleepers to be painted yellow at measurement site.

3.1.11 The system shall not be installed in a joint-less track circuit tuning area.

3.1.12 The system shall not be installed within a 50 m perimeter of all joint-less type track circuit that is connected to the rail.

3.1.13 The equipment enclosure shall preferably not be further than 3 meters from the rail and/or track side equipment, as defined in the Permanent Way Instructions.

3.1.14 Cable trenching shall be done according to specification. (see referenced documents above).

3.1.15 The system enclosure shall provide its own earth ground plane (earth spike/mat etc).

3.1.16 The system shall be earthed (bonded) to the rail return leg (not to the signalling rail leg).

3.1.17 The system earth, surge & lightning protection shall work independently of the signal rail (i.e. should a bond break off the HBED system shall not be affected).

3.1.18 All the earth cables shall be terminated at a common point (equipotential bus bar).

3.4 Train operation pattern/guidance for site selection

The appropriate site shall have characteristics that will maximise the effectiveness of capturing the wheel bearing temperatures. These characteristics shall include:

3.4.1 No brake application will be performed under normal operating conditions for the full length of the train while the train is passing the measurement site.

3.4.2 The train is operated uniformly (no acceleration or deceleration) while passing the measuring site so as to avoid run-in or stretching of the train.

3.4.3 Proximity of a siding (to remove wagons): sidings must be available as close as possible not more than 8 km on both sides of the site.

3.4.4 Train speeds of between 5 and 80 km/h shall be maintainable for the full train's length passing the measuring site.

3.5 Atmospheric Pollution

3.5.1 The HBED system shall not be installed close to any excessive pollution and dust generating activities that may increase corrosion, maintenance and increased failure of moving parts.

3.5.2 Sites as listed below should be avoided as far as possible:

- A chemical factory, power station, stone/sand quarries & mines.
- Dirt road crossings - Public roads.
- Exposure to direct sea air.

3.6 Track Condition

The following track conditions shall be the most suitable:

3.6.1 Track condition shall conform to a minimum of a B preferably A – Standard as per Perway track maintenance specification.

3.6.2 The track gauge and alignment shall be uniform and unchanging to minimise vehicle movement.

3.6.3 Good track geometry that will allow minimal vehicle dynamics to occur (rock/roll, pitch/bounce, etc).

3.6.4 This site shall be on a straight and level section. The level section must be sufficiently long (e.g. 2km for coal line and 4km for ore line) to ensure that the brakes will not be on under normal operating conditions.

3.6.5 The sleeper spacing shall be 650mm from sleeper centre to sleeper centre to accommodate the track mounted equipment frame (must be corrected before equipment installation if not 650mm).

3.6.6 The HBED shall not be installed within station or yard limits (e.g. points/turn-out) section of rail.

3.6.7 The HBED shall be installed on a level site (i.e. gradient of at most 1:100).

4 Site overview drawing

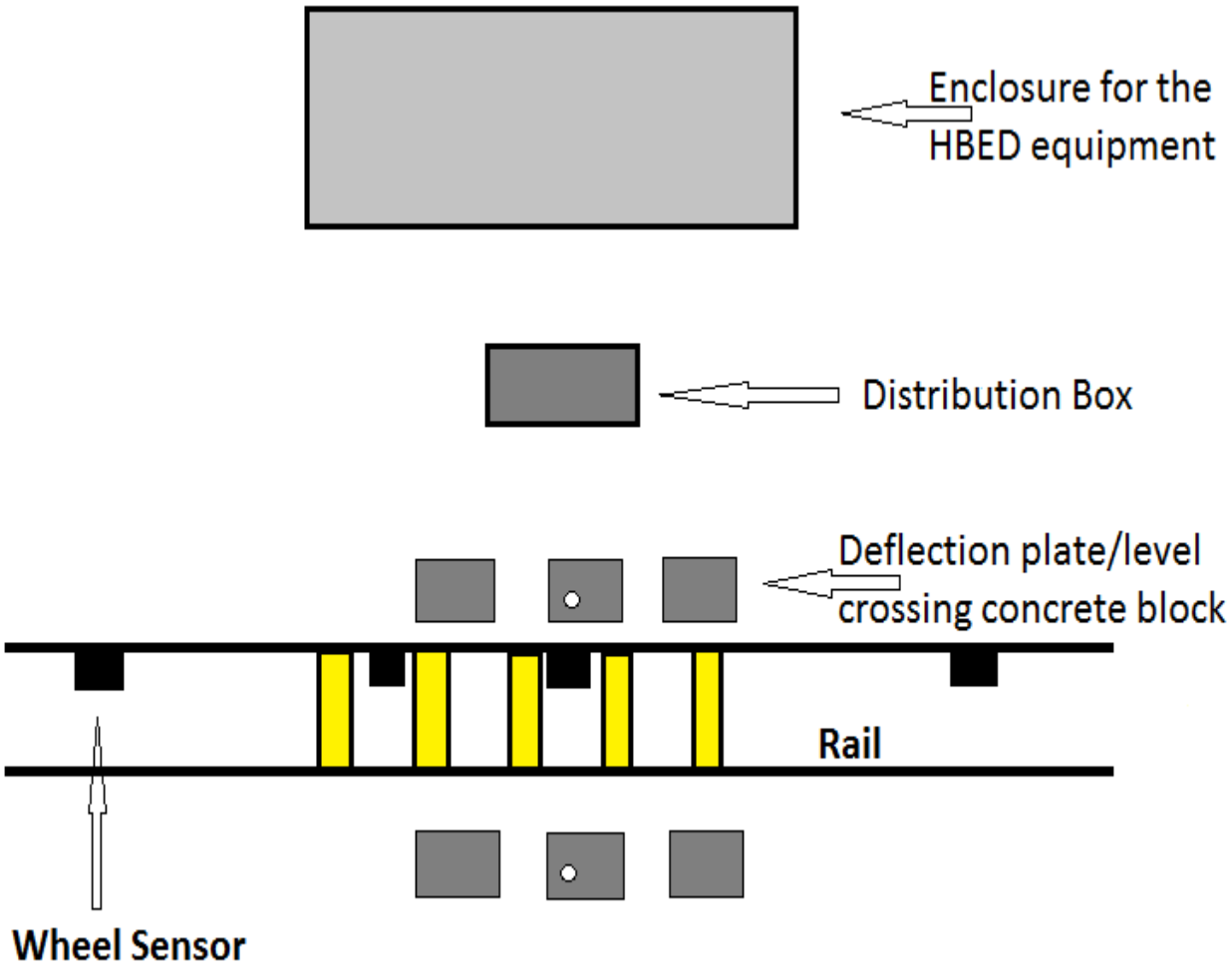

Figure 1 – Typical layout and showing sleepers painted yellow.