



# WMSC Inspection Report 20260318A

ISSUED 03/23/2026

## Inspection Details

Title: Track Thermite Welding Training Observation

Location: New Carrollton Yard (D99)

Date of Inspection: 3/9/26, 3/12/26, 3/16/26, and 3/17/26

Time of Inspection: 10:00pm to 6:00am

Announced (via phone to Senior Vice President, Track and Structures 3/6/26)

Risk-Based (Corrective Action Plan – CAP C-0022)

Functional Area: Track

Hazard Rating: 2C

## Overview

On March 9, 12, 16, and 17, 2026, a WMSC Inspector attended an overnight Metrorail Track and Structures (TRST) thermite welding class conducted at New Carrollton Rail Yard (D99) to assess the training and curriculum. Metrorail created this thermite welding training to ensure personnel have the knowledge and skills required to perform safe and effective welds.

This is a risk-based inspection based on corrective action plan C-0022, which corresponds with finding 2 from the [WMSC's 2020 Audit of Track Maintenance and Training](#). That audit identified incomplete instructions for personnel conducting thermite welding. The purpose of this inspection was to observe the welding training course Metrorail has created to address this issue.

Thermite welding is a process used in the transit industry to join rail sections into continuous welded rail (CWR). CWR is a method where steel rails are welded together into long, continuous sections. This method provides strong, durable joints capable of withstanding heavy loads and environmental stress. Proper training in thermite welding is essential to ensure worker safety, weld integrity, and compliance with industry standards.

On November 21, 2025, Metrorail's Track and Structures Department issued Maintenance Bulletin #20251121-95 to address the rising frequency of thermite weld breaks, aiming to reduce recurring failures and enhance weld quality. Prior to this bulletin, Track and Structures observed a surge in rail breaks at thermite welds. In a proactive measure, Metrorail engaged a thermite welding



specialist to provide employee training, aiming to reduce the likelihood of defects and failures in future welds, and to ensure consistency and quality in the rail welding process.

After concluding the inspection, the WMSC Inspector conducted a debrief with the Senior Vice President of Track and Structures, in accordance with Program Standard Section 6.F.1.

## **Defects and Corrective Actions**

WMSC Inspections identify safety issues that may be classified as defects, findings, or recommendations. Findings and recommendations are defined by Program Standard Section 5.E.2 and 5.E.3 respectively. Ordinarily, issues identified in a WMSC inspection report are classified as defects. Defects are specific safety issues of non-conformance/non-compliance that are identified, and that require remedial action.

This inspection did not identify any findings or recommendations and therefore does not require a WMSC Corrective Action Plan in accordance with Program Standard Section 5.E.4.

## **Defect Observations and Determinations**

### **Observation 1**

The majority of weld failures were traced back to the base of the rail, with analysis revealing that these issues were primarily due to a lack of fusion at this critical point. Such failures can arise from inadequate heating during the thermite welding process, as well as from misalignment of the mold center, which should be positioned vertically in relation to both the gap and the base brick during welding.

### **Photos**



Photo 1: Failure of the weld at the base of the rail.

### **Observation 2**

The rail base area is typically not included in standard ultrasonic testing procedures, as a significant portion of the rail falls outside the effective range of the ultrasonic testing equipment.



## Photos



Photo 2: Shows the range that the Ultrasonic testing covers on the rail, which excludes the outside base of the rail.

## Observation 3

Updated thermite welding procedures used in training.

Temperature: For welding below 0°F consult supervisor.  
Slow cooling is required when welding 0°F to 40°F

### Preheat Burner

15 psi Propane

65 psi Oxygen

3/8" T – Grade twin 50' Hose

Burner Height: 1 3/8"      Gap: 1" to 1 1/8"

Crown: Using a 3' straight edge .065" to .075"

Flame clean rail ends and use a wire brush to remove debris.

Preheat: Achieve a bright Orange Yellow color in the web and base area, no melting of rail ends.

115 RE – Min 5-6 min

132 RE – Min 6 min

136 RE – Min 6 min

141 RE – Min 6 min

True rail end color can be seen when the torch is removed from the molds.

**INSPECT ENTIRE GAS TRAIN IF RAIL END COLOR IS NOT CORRECT**

Ignition Time: Starts when you see flame through the top of the crucible.

Acceptable Tap: Between 15 and 60 seconds

Breakdown: Time starts when the last drop of slag falls into the slag pan

Crucible Removal: Remove within 3 minutes after pour

Slag Pan, Mold Clamp & Shoe Removal: 5 minutes after pour

Demolding: 6 minutes after pour

Shear: Commence when molten movement stops

Wedge Removal: Wedges can be removed at 20 minutes or 900°F after pour

Rough Grinding: Can be performed immediately after shearing, leaving sufficient metal for finish grinding

Traffic: Is permitted when weld has cooled to 700°F and wedges have been removed

Finish Grinding: All grinding should be completed before the weld reaches 600°F. If the weld cools below 600°F no bluing of the weld is permitted.



Photo 3: Thermite welding procedures.

#### **Observation 4**

Several Track and Structures supervisors were unfamiliar with the Hot Work Program Manual, particularly the guidelines in Section 6.1 on Personal Protective Equipment (PPE). Additionally, the supervisors did not know how to access this manual. This issue was the subject of Corrective Action Plan C-0228, which closed on April 28, 2023.

#### **Next Steps**

Please respond **by Thursday, March 26, 2026**, to acknowledge receipt.