

Scope and Purpose

- a) This document will address readiness with respect to Works Test Certificate.
- b) The Review Recorder will be responsible for documenting the information gathered at the readiness review meeting to produce this document.
- c) Please complete this checklist during the Works Test Certificate Readiness Review to verify all preparatory work has been completed and all requirements specified under Clause 6 (Testing) of the Agreement have been complied with to allow the Company to issue a Works Test Certificate with respect to this New Train.

The Works Test Certificate Readiness Review is conducted to determine if the New Train under review is ready to advance to the Delivery Readiness Review Phase by deciding whether the activities are complete and verifying their compliance with the requirements of the Agreement.

Review Date:	29/09/2023
Scheduled Acceptance Date:	31/10/2023

Works Test Certificate Readiness Review Checklist - Activity Description						
Category	Description	Outcome				Evidence
		Yes	Yes with conditions	No	N/A	
Works Tests	Have all the Works Tests been successfully completed?	✓				Document Transmittal GIB-PRA-MSA-T002246. Please refer to Appendix A for further details.

WORKS TEST CERTIFICATE READINESS REVIEW

EM 01 20 180

Works Test Certificate Readiness Review Checklist - Activity Description						
Category	Description	Outcome				Evidence
		Yes	Yes with conditions	No	N/A	
Responsibility Matrix	Has each party performed its obligations set out in the Responsibility Matrix applicable to and/or necessary for valid Delivery?	✓				The obligations referenced under items 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 19, 20, 23, 24, 25, 26, 27, 30, 31, 34, 35, 38, 39, 46, 47, 48, 51, 52, 54, 57, 58, 59, 62, 63, 66, 67, 68, 71 & 72 of the Responsibility Matrix, Schedule 11 of the MSA, have been performed.

Signed by the Project Manager's Representative on behalf of the Company Name <u>Andani Masikhwa</u> <i>Andani Masikhwa</i> Signature _____ Date <u>May 03, 2024</u>	Signed by the Engineers Representative on behalf of the Contractor Name <u>Admin Admin</u> <i>admin admin</i> Signature _____ Date <u>May 03, 2024</u>
By signing this document I agree that the New Train, the subject of this review, is eligible to receive a Works Test Certificate.	

Appendix A

Works Tests Completion

The scope of the Works Tests (Type and Routine) is specified in the following:

- Part 8 (Testing) of Schedule 3 (Agreement Management) of the Manufacture and Supply Agreement (the MSA);
- Test Programme reference GIB0000000009 Version FO.

Type Test:

- EM 01 20 180 is functionally the same as the Metro 3kV trains manufactured in Lapa (EM 01 00 03 to EM 01 00 20) i.e. no new design, therefore no new type tests at train level required.

Routine Test:

- Test Reports provided to the Company undercover document Transmittal GIB-PRA-MSA-T002246.

The Engineer of the Contractor confirms that the Works Tests related to the New Train EM 01 20 180 have been successfully completed.

Supporting documentation:

- Test Programme, reference GIB0000000009 Version FO

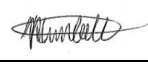


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RELEASED			X'TRAPOLIS MEGA				Application: PRASA		
Technical Modifications		Geometric tolerances		A4		N			
F0		General Update							
E0		PRASA Comments		Replaces :		Replaced by :			
C0,D0		Internal Updates							
B0		Updated							
A1		Updated							
A0		Creation							
Index		Revision Notification no.							
Prepared		11/07/2022		P Mabuyakhulu		Test Programme			
Checked		11/07/2022		N Munillai					
Approve		11/07/2022		D Govender					
		Date		Name					
		en							
		GIB0000000009					F0		1/12

Table of Modifications

[illegible]

Internal Validation

	Name	Function	Date	Signature
Writer	Palesa MABUYAKHULU	Project Planning Manager	See Smart Card signature	7/11/2022 X  Palesa Mabuyakhulu PrPM Signed by: palesa MABUYAKHULU
Checker	Nitesh MUNILLAL	Project Engineering Manager	See Smart Card signature	7/11/2022 X  Nitesh Munilall PrEM Signed by: Nitesh MUNILALL
Approver	Devendran GOVENDER	Project Manager	See Smart Card signature	11/07/2022 X  Devendran Govender PM Signed by: devendran GOVENDER

Document
reference:

GIB0000000009

Gibela Test Programme

Revision: F0

Date 11/07/2022

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1 PURPOSE

The aim of this document is to describe all the train level tests under the MSA Contract. These include Type Tests done on Trainset 1 & 2, Tests to be performed on all new trains manufactured and all other tests necessary due to modifications.

2 TYPE TESTS ON THE FIRST OF EACH TYPE OF TRAIN (VARIANT)

2.1 3kV METRO

2.1.1 Tests on Trainset 1 and 2

2.1.1.1 Train Set 1

Train 1		
Name	Start	Finish
STRUCTURE TEST: CBS TESTING		
CBS structure test including lifting ability testing	Wed 17-06-15	Fri 17-07-15
TRAIN 1: ELECTRICAL STATIC TESTING		
TRAIN 1: TCMS FUNCTIONAL TESTING (START OF VALIDATION)		
TCMS - DDU - Main functions static functional test	Mon 13-07-15	Tue 14-07-15
TCMS - CAB - Automatic start and cabin control static functional test	Mon 13-07-15	Tue 14-07-15
TCMS - PNT - Pantograph static functional test	Tue 14-07-15	Wed 15-07-15
TCMS - HSC - Main circuit breaker static functional test	Tue 14-07-15	Wed 15-07-15
TCMS - NET - Network management static functional test	Wed 15-07-15	Thu 16-07-15
TRAIN 1: STATIC VALIDATION UNDER HV		
TCMS - AIR - Air production and distribution static functional test	Wed 15-07-15	Thu 16-07-15
TCMS - NRG - Electrical energy static functional test	Thu 16-07-15	Mon 20-07-15
Energy supplying test	Thu 16-07-15	Tue 21-07-15
Air production (including airtightness)	Tue 21-07-15	Thu 23-07-15
Battery autonomy test (with Shore Supply)	Tue 21-07-15	Thu 23-07-15
TCMS - DSD - Dead man device static functional test	Thu 23-07-15	Fri 24-07-15
TCMS - SBK - Service brake static functional test	Thu 23-07-15	Fri 24-07-15
TCMS - BKT - Traction and electrical braking static functional test	Fri 24-07-15	Mon 27-07-15
TCMS - DRC - Driving command dynamic functional test	Fri 24-07-15	Mon 27-07-15
Traction System Operational Test	Mon 27-07-15	Mon 10-08-15
TCMS - PBK - Parking brake static functional test	Mon 10-08-15	Tue 11-08-15
TCMS - UBK - Emergency brake static functional test	Mon 10-08-15	Tue 11-08-15
Energy Consumption Measurement	Thu 30-07-15	Fri 31-07-15
Vehicle Dimensions Measurement	Wed 12-08-15	Thu 13-08-15

2.1.1.2 Train Set 2

Train 2		
Name	Start	Finish
TRAIN 2: MECHANICAL TESTING		
Mechanical Testing on Production Line (TC1)		
Bogie Car Clearance	Wed 01-07-15	Thu 02-07-15
Static Gauge Test	Thu 02-07-15	Fri 03-07-15
Protective bonding and Earth Return Circuit tests	Mon 06-07-15	Tue 07-07-15
Mechanical Testing on Production Line (M4)		
Static Gauge Test	Mon 13-07-15	Tue 14-07-15
Protective bonding and Earth Return Circuit tests	Tue 14-07-15	Wed 15-07-15
Car-Car Clearance Test (Vertical)	Thu 16-07-15	Fri 17-07-15
Car-Car Clearance Test (Horizontal)	Fri 17-07-15	Mon 20-07-15
Mechanical Testing on Production Line (M1)		
Current Collection Static Test	Wed 15-07-15	Thu 16-07-15
Bogie Car Clearance	Thu 16-07-15	Fri 17-07-15
Protective bonding and Earth Return Circuit tests	Mon 20-07-15	Tue 21-07-15
Car-Car Clearance Test (Vertical)	Wed 22-07-15	Wed 22-07-15
Car-Car Clearance Test (Horizontal)	Thu 23-07-15	Thu 23-07-15
Mechanical Testing on Production Line (TC2)		
Car-Car Clearance Test (Vertical)	Tue 28-07-15	Tue 28-07-15
Car-Car Clearance Test (Horizontal)	Wed 29-07-15	Wed 29-07-15
Protective bonding and Earth Return Circuit tests	Fri 31-07-15	Fri 31-07-15
Mechanical Testing on Production Line (M2)		
Current Collection Static Test	Tue 28-07-15	Wed 29-07-15
Static Gauge Test	Wed 29-07-15	Thu 30-07-15
Protective bonding and Earth Return Circuit tests	Mon 03-08-15	Tue 04-08-15
Mechanical Testing on Production Line (M3)		
Protective bonding and Earth Return Circuit tests	Thu 06-08-15	Thu 06-08-15
TRAIN 2: ELECTRICAL STATIC TESTING		
TCMS - SGL - External lighting and signalling static functional test	Fri 04-09-15	Tue 08-09-15
TCMS - LGT - Internal lighting static functional test	Fri 04-09-15	Tue 08-09-15
TCMS - HVA - HVAC static functional test	Tue 08-09-15	Thu 10-09-15
TCMS - DOR - Doors static functional test	Thu 10-09-15	Mon 14-09-15
TCMS - CTV - CCTV static functional test	Mon 14-09-15	Thu 17-09-15
TCMS - PIS - Public address and passenger information static functional test	Thu 17-09-15	Tue 22-09-15
TCMS - COM - Train to ground communication static functional test	Thu 17-09-15	Tue 22-09-15
TCMS - REC - Event recorder performances and static functional test	Tue 22-09-15	Fri 25-09-15
TCMS - PCS - Passenger counting system static functional test	Tue 22-09-15	Fri 25-09-15
TCMS - DDK - Driver desk and auxiliaries static functional test	Fri 25-09-15	Tue 29-09-15
Performance Testing		
Doors system performances test	Tue 29-09-15	Tue 06-10-15
Lighting System Performances Test	Tue 06-10-15	Fri 09-10-15
HVAC Performance Test	Fri 09-10-15	Fri 16-10-15
Noise Test Static	Fri 16-10-15	Fri 23-10-15

Document
reference:

GIB0000000009

Gibela Test Programme

Revision: F0

Date 11/07/2022

Vehicle Internal Dimensions Measurement	Fri 23-10-15	Mon 26-10-15
TCMS - FSD - fire and smoke detection static functional test	Mon 26-10-15	Thu 29-10-15
ERTMS Testing		
ERTMS Commissioning	Tue 03-11-15	Tue 10-11-15
TCMS - ETS - ERTMS functional static test	Tue 10-11-15	Thu 12-11-15
ERTMS Integration and Functional Tests	Thu 12-11-15	Tue 17-11-15

2.2 METRO 25kV

To be confirmed

2.3 METRO 3kV (WITH TOILET)

To be confirmed

2.4 METRO EXPRESS 3kV

To be confirmed

3 TESTS TO BE PERFORMED ON ALL NEW TRAINS (ROUTINE TESTS)

For the PRASA project Gibela has implemented an exhaustive test program to perform the static routine testing at vehicle and train level including the dynamic routine test schedules. After the handover of each car from production to testing, the train is progressively coupled to formulate a six-car trainset. In parallel to the coupling activities Vehicle Functional Static Testing is performed individually on the six cars. Static testing is continued to train functional level

After the static tests have been performed, the dynamic test is done on a 1.2 km test track in the Dunnottar Dynamic Test Track to verify all the safety functions of the train up to 60 km/h. The train is then transported to Wolmerton Depot for the final acceptance test (including tests at 120km/h and tests of the UHF radio) and handover to the customer.

3.1 WORK TESTS

The following tests are performed on each new vehicle as part of the Works test:

- Vehicle Pre- Testing (VPT) GIB0000001325
- Vehicle Functional Testing TC1 (VFT) GIB0000001312
- Vehicle Functional Testing TC2 (VFT) GIB0000001313
- Vehicle Functional Testing M1 (VFT) GIB0000001314
- Vehicle Functional Testing M2 (VFT) GIB0000001315
- Vehicle Functional Testing M3 (VFT) GIB0000001316
- Vehicle Functional Testing M4 (VFT) GIB0000001317
- Train Functional Routine Static Testing (TFS) GIB0000001101
- Train Functional Dynamic Testing (TFD) GIB0000001029

3.2 ACCEPTANCE TESTS

3.2.1 STATIC ACCEPTANCE TEST

There are no static acceptance tests performed as part of the acceptance of the new train as all tests performed at Dunnottar are categorised as Works Tests.

3.2.2 ON TRACK ACCEPTANCE TEST

- Acceptance Test on Customer Track (ACT) GIB0000000293

4 FUTURE TESTS REQUIRED DUE TO MODIFICATIONS

To be confirmed

X'TRAPOLIS MEGA

SUMMARY REPORT

Photo-not-contractual

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RELEASED

X'TRAPOLIS MEGA

Application: **PRASA**

Technical Modifications

Geometric tolerances

A4

N

Replaces:

Replaced by:

A0

Creation

Index

Revision Notification no.

Prepared

03/10/2023

K. NKOANA

Checked

03/10/2023

N. NDOVELA

Approved

03/10/2023

M. SIBIYA

Date

Name

en

**Summary Report of open items from
TS180 Routine and Acceptance
Testing**

**GIBELA**

GIB0000004881

Rev.:
A0

1/10

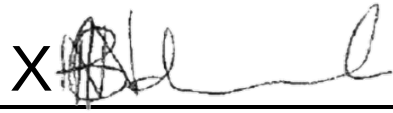
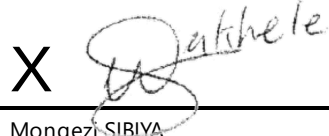
Table of Modifications

Rev	Date	Modifications Content	Writer
A0	03/10/2023	Creation	Kgomotso NKOANA

	Reference: GIB0000004881	Rev.: A0	Summary Report of open items from TS180 Routine and Acceptance Testing	Date:03/10/2023
				2/10

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Internal Validation

	Name	Function	Date	Signature
Writer	Kgomotso NKOANA	Test Expert	03/10/2023	X  Kgomotso NKOANA Test Expert
Checker	Nkululeko NDOVELA	Test Engineering Manager	03/10/2023	X  Nkululeko NDOVELA Test Engineering Manager
Approver	Mongezi SIBIYA	T&C HoD	03/10/2023	X  Mongezi SIBIYA T&C HoD

	Reference:	Rev.:	Summary Report of open items from TS180 Routine and Acceptance Testing	Date:03/10/2023
	GIB0000004881	A0		3/10

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	Reference: GIB0000004881	Rev.: A0	Summary Report of open items from TS180 Routine and Acceptance Testing	Date:03/10/2023
				4/10

1 INTRODUCTION

For the PRASA project Gibela has implemented an exhaustive test program to perform the static routine testing at vehicle and train level including the dynamic routine test schedules. After the handover of each car from production to testing, the train is progressively coupled to formulate a six-car trainset. In parallel to the coupling activities Vehicle Functional Stating Testing is performed individually on the six cars. Static testing is continued to Train Functional Level.

After the static tests have been performed, the Dynamic Test is done on a 1.2 km test track in the Dunnottar Dynamic Test Track to verify all the safety functions of the train up to 60 km/h. The train is then transported to Wolmerton Depot for the final high speed acceptance test and handover to the customer.

2 SCOPE

The purpose of this document is to summarize the test results of the different test schedules.

The complete test report for each test schedule including all the test steps with respect to the pass/fail criteria will be submitted.

3 TEST CONDITIONS

Vehicles Tested

TS180 is composed of vehicles:

- TC1# 01 20 180 1
- M4 # 01 20 180 2
- M1 # 01 20 180 3
- M2 # 01 20 180 4
- M3 # 01 20 180 5
- TC2 # 01 20 180 6

Test Schedule

The tests were performed following the Routine Test Schedules

- Vehicle Pre- Testing (VPT) GIB0000001465 rev D2
- Vehicle Functional Testing TC1 (VFT) GIB0000001462 rev D2
- Vehicle Functional Testing TC2 (VFT) GIB0000001463 rev D1
- Vehicle Functional Testing M1 (VFT) GIB0000001464 rev D2
- Vehicle Functional Testing M2 (VFT) GIB0000001465 rev D2
- Vehicle Functional Testing M3 (VFT) GIB0000001466 rev D1
- Vehicle Functional Testing M4 (VFT) GIB0000001467 rev D1
- Train Functional Routine Static Testing (TFS) GIB0000001241 rev D0
- Train Functional Dynamic Testing (TFD) GIB0000001029 rev D2
- Acceptance Test on Customer Track (ACT) GIB0000000293 rev D0

General test conditions

No specific ambient conditions were mandatory during testing.

Static and Dynamic Test location

The tests were conducted at the Gibela Dunnottar factory in South Africa

	Reference:	Rev.:	Summary Report of open items from TS180 Routine and Acceptance Testing	Date:03/10/2023
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Test participants

Last Name	First Name	Company	Occupation
MABUNDA	Neliswa	Gibela	EPU Manager
LUKHELE	Sifiso	Gibela	Serial Test Manager
NKOANA	Kgomotso	Gibela	Test Expert
NGUBANE	Lindani	Gibela	Senior Test Technician
MOCWAGOLE	Kealeboga	Gibela	EPU Manager
MAPONYA	Kamogelo	Gibela	EPU Manager
TSHIOVHE	Fhatuwane	Gibela	Senior Test Technician
MASEKO	Valentine	Gibela	Test Technician
MAKOLA	Hilda	Gibela	Test Technician
ZULU	Nokukhanya	Gibela	Test Technician
XULU	Sithembile	Gibela	Test Technician
MATSHAVA	Junior	Gibela	Test Technician
SEBOLA	Mashadi	Gibela	Test Technician
NDLOVU	Ntobeko	Gibela	Test Technician
MERAFA	Mavis	Gibela	Test Technician
SHINGA	Sthabile	Gibela	Test Technician
MABUNDZANE	Nick	Gibela	Test Technician
GUMEDE	Carol	Gibela	Test Technician
ZULU	Vusumuzi	Gibela	Test Technician
MTHEMBU	Mvelo	Gibela	Test Technician
MILANI	Philemon	Gibela	Test Technician
KHOSA	Tshembhani	Gibela	Test Technician
TSELA	Impi	Gibela	Test Technician
MAKAYA	Linda	Gibela	Test Technician
FUNYUFUNYU	Mbavhalelo	Gibela	Test Technician
CHIRWA	NQOBILE	Gibela	Test Technician
SIBANYONI	Sizwe	Gibela	Test Technician
MAKHANYA	Thandanani	Gibela	Test Technician
SEKGOLOLO	Alleta	Gibela	Test Technician
MOIANE	Oupa	Gibela	Test Technician
MKHONTO	Simphiwe	Gibela	Test Technician
MASONDO	Nhlakanipho	Gibela	Test Technician
MLABA	Vuma	Gibela	Test Technician
SIGUDLA	Walter	Gibela	Test Technician

Routine test Period

The routine test was performed from the 14th of September 2023 until the 22nd of September 2023 in Dunnottar.

	Reference:	Rev.:	Summary Report of open items from TS180 Routine and Acceptance Testing	Date:03/10/2023
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Acceptance Test location

High-Speed Acceptance Test on the Customer Main Line (De-Wildt), The dynamic performance to be validated to a maximum speed of 60km/h inclusive, ensuring compliance to service, emergency and degraded mode braking performance.

Acceptance Test participants

Last Name	First Name	Company	Position
TBA			

Acceptance Test period

The High speed Acceptance test to be performed in Wolmerton, Customer Main Line (De-Wildt).

	Reference:	Rev.:	Summary Report of open items from TS180 Routine and Acceptance Testing	Date:03/10/2023
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4 TEST RESULTS

Vehicle Pre-Testing

RTR Vehicle Pre-Testing TS180 Report GIB0000004877 rev A0

All test steps were performed and passed successfully

Vehicle Functional Testing

RTR Vehicle Functional Static Testing TS180 TC1 Report GIB0000004875 rev A0

RTR Vehicle Functional Static Testing TS180 TC2 Report GIB0000004876 rev A0

RTR Vehicle Functional Static Testing TS180 M1 Report GIB0000004871 rev A0

RTR Vehicle Functional Static Testing TS180 M2 Report GIB0000004872 rev A0

RTR Vehicle Functional Static Testing TS180 M3 Report GIB0000004873 rev A0

RTR Vehicle Functional Static Testing TS180 M4 Report GIB0000004874 rev A0

All test steps were performed and passed successfully

	Reference:	Rev.:	Summary Report of open items from TS180 Routine and Acceptance Testing	Date:03/10/2023
	GIB0000004881	A0		8/10

Train Functional Static Testing

RTR Train Functional Static Testing TS180 Report GIB0000004878 rev A0

All test steps were performed and passed successfully with an exception of Train ground communication, the confirmation of train connectivity to Train tracer CFM. The Netbox sim card is not issued.

Train Functional Dynamic Testing

RTR Train Functional Dynamic Testing TS180 Report GIB0000004879 rev A0

All test steps were performed and passed successfully

Acceptance Test on Customer Track

RTR TS180 Acceptance Test on Customer Track test report GIB0000004880 rev A0

All routine (works) tests have been performed and completed successfully. The Acceptance Test on customer track that covers the high speed 120km/h and UHF radio functional tests will be performed in Wolmerton.

	Reference:	Rev.:	Summary Report of open items from TS180 Routine and Acceptance Testing	Date:03/10/2023
	GIB0000004881	A0		9/10

5 CONCLUSION AND RECOMMENDATION

All routine (works) tests have been performed and completed successfully with an exception of

1. Train ground communication, a test that covers the confirmation of train connectivity to Train tracer CFM. The Netbox sim card is not issued.

The Acceptance Test on customer track that covers the high speed 120km/h and UHF radio functional tests will be performed in Wolmerton.

	Reference:	Rev.:	Summary Report of open items from TS180 Routine and Acceptance Testing	Date:03/10/2023
	GIB0000004881	A0		10/10