



TRANSNET ENGINEERING

**COACHES BUSINESS
OF TRANSNET ENGINEERING
A DIVISION OF TRANSNET LIMITED**

TECHNICAL SPECIFICATION

THE SUPPLY OF DENTAL EQUIPMENT FOR THE PHELOPHEPA HEALTHCARE TRAINS

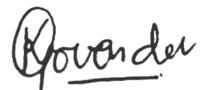
REVISION 3

DATE RELEASED:

29 June 2026

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DOCUMENT CONTROL

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LIST OF REVISIONS

Rev.	Date	Responsible Person	Amendments	Classification
0	13/08/2025	W. Arendsen	Original	
1	16/09/2025	W. Arendsen	Various	
2	23/06/2026	W. Arendsen	Various	
3	29/06/2026	W. Arendsen	Various	

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1. INTRODUCTION

1.1. This technical specification details requirements for new dental equipment required on the Phelophepa Health Trainsets. The specification details the requirements for the supply, installation, testing, commissioning and maintenance of the required equipment. All the equipment is permanently installed in a railway coach, and it must be robust to withstand rail movement.

2. SCOPE

2.1. SCOPE OF SUPPLY

2.1.1. The scope of supply is defined in Annexure A.

2.1.2. The scope includes:

- a. Design integration into the coach
- b. Supply
- c. Install
- d. Complete installation as integrated into the coach
- e. Testing and commissioning of the equipment
- f. Tenderer to supply approved drawings of all tapping plate requirements of their equipment that must be incorporated into the coach build. Loose tapping plate requirements will be for the tenderer's supply.
- g. Complete set 3x (i.e., 2x hard copy and 1x soft copy USB flash drive or secure downloadable link) of:
 - i. Operating manuals
 - ii. Maintenance manuals
 - iii. Fault finding and diagnostics
 - iv. Installation instructions
 - v. Calibration procedures

2.1.3. 12 months warranty (minimum)

2.1.4. A 3-year maintenance and repair contract is required.

3. GENERAL REQUIREMENTS

- 3.1. The equipment provided in this tender will be installed into a coach in the arrangement shown in Annexure B and C.
- 3.2. The equipment must adhere to the latest approved versions of the South African Health Products Regulatory Authority (SAHPRA) and Directorate: Radiation Control (DRC) Standards.
- 3.3. The equipment to be able to operate in a rail environment as per conditions set out in Clause 4.
- 3.4. Equipment to be robust and vandal-proof, as it will be utilised by various personnel, including students.
- 3.5. Bidders must vouch that all equipment provided in this tender will not be phased out within 10 years of this tender being awarded. This is to ensure the availability of spares during the expected lifespan of the equipment. Where the 10-year expected lifespan is not practical, tenderers are to supply supporting documentation stating the life cycle terms per product as indicated in Clause 6.1.4.
- 3.6. A clause-by-clause response must be submitted indicating compliance to each section of this specification. **The clause-by-clause must be completed fully and submitted with the tender submission.**

4. OPERATING ENVIRONMENT

4.1. Elevation

The train operates between coastal and inland centres at altitudes between sea level and 1,800 meters above.

4.2. Temperature Extremes

The ambient temperatures to which the train is exposed for prolonged periods vary between -10 °C and 40 °C, while temperature extremes of -15 °C and 50 °C are not uncommon.

4.3. Humidity And Environmental Conditions

The train may operate and be stabled in an atmosphere of average humidity exceeding 80%, with 100% being common. When operating or stabled at coastal areas, a very humid, salty atmosphere, which is extremely corrosive, will be encountered. When operating or stabled inland, extremely dry, dusty and windy conditions will be experienced during most of the year.

4.4. Forces

The tenderer must note that acceleration forces in a train can be high. These accelerations can be caused by shunts or in train dynamics. Tenderers shall clearly indicate what precautions they would take to prevent or minimise risk of failures caused by such accelerations.

- Longitudinal: 5G
- Lateral: 1.5G
- Vertical: 2G

The tenderer must understand that this equipment will be installed into a coach that will be moving at 90 km/h.

4.5. Pitch & Roll

The train can be stationary at inclinations, e.g., pitch = 1:50 and roll = 1:10.

5. TECHNICAL REQUIREMENTS

- 5.1. Equipment must adhere to South African Health Products Regulatory Authority (SAHPRA) and Directorate: Radiation Control (DRC) Standards.
- 5.2. The equipment must be robust and able to withstand the train operating conditions specified in Clause 4, however, the equipment will only be used while the train is stationary.
- 5.3. The equipment must be vandal-proof, as we will have various personnel and students operating the equipment at any given time.

6. OPERATIONAL REQUIREMENTS

6.1. Portability and Compact Design

- 6.1.1. Equipment must be lightweight and compact to allow for easy movement and setup in confined spaces, where applicable. All items as specified in Annexure A must fit in the space shown in Annexures B and C.
- 6.1.2. Equipment must fit in train cabinets or foldable workstations on the train, where applicable.
- 6.1.3. It is preferable that equipment be provided with protective cases for safe storage during train movement, where applicable.

6.2. Durability and Vibration Resistance

- 6.2.1. Equipment must withstand constant motion, vibrations, and sometimes sudden braking of the train.
- 6.2.2. Shock-absorbing mounts and/or anti-slip bases must be standard.

6.3. Energy Efficiency and Backup Compatibility

- 6.3.1. To prevent the loss of operation during generator outages, equipment of the following nature will be most suitable:
 - Low-power or battery-operated devices, where possible

- Quick rechargeable batteries with a minimum charge duration of 6 hours, and with 5-7 hours of operating time.
- Compatibility with UPS (Uninterrupted Power Supply) systems, where possible.

6.4. Ease-of-use and Minimal Training Requirements

6.4.1. Equipment must be intuitive to operate, especially for:

- Student interns or rotating volunteers
- Multidisciplinary teams with different experience levels

6.4.2. Equipment must be easy to operate, as this will yield higher throughput

6.4.3. Equipment must offer automatic alignment, as this feature saves on setup time and is, in most cases, more accurate.

6.4.4. Equipment must allow fast and efficient troubleshooting to minimise downtime

6.4.5. Equipment must be easy to operate, as it reduces the dependency on highly trained personnel.

6.5. High Throughput and Quick Testing Capabilities

6.5.1. Equipment must support fast patient turnover without sacrificing accuracy.

6.5.2. Equipment that is automated or multi-function systems is permitted, as it can streamline workflow.

6.6. Easy to Clean and Disinfect

6.6.1. Equipment must be easy to clean, as in high-volume mobile clinics, infection control is critical.

6.6.2. Equipment must be:

- Resistant to alcohol-based disinfectants
- Designed without crevices where dust and debris can collect

6.7. Connectivity

6.7.1. Equipment must offer offline capabilities for areas with poor network connectivity.

6.8. Versatility and Adaptability

6.8.1. Multi-function equipment will be permitted, as it reduces the total number of machines needed. Note that such details must be shared with the tender submission.

6.8.2. Equipment must accommodate paediatric, geriatric, and special-needs patients

7. SUPPORTING DOCUMENTATION

7.1. Bidders are required to submit supporting documents with their tender submission to facilitate fair and accurate evaluation.

7.2. These supporting documents are deemed essential.

7.3. The required supporting documents are defined below, along with their specific requirements:

7.3.1 Technical Specifications

7.3.1.1 Bidders are required to submit technical specifications/datasheets for all products contained in Annexure A.

7.3.1.2 The technical specifications/datasheets must be original literature as provided by the respective OEM.

7.3.1.3 The nature of the details that are required to appear in the specifications/datasheets will include, but will not be limited to:

- Original equipment manufacturer (OEM) name and model
- Product features
- A list of sub-components that make up the assembly (kit), if applicable
- Materials that make up the various items of the kit (high level)
- Dimensions/volume/capacity
- Electrical specifications and requirements

- Images of the products
- Operational requirements that specify adherence to Clause 4

7.3.2 Maintenance Methodology

7.3.2.1. Tenderers are to be aware that all services throughout the year will be conducted while the train is in service, and in certain circumstances, the train will be under live electrical overhead lines. The necessary safety precautions will be taken to conform to moving train rules that will be shared during the safety briefing with the train manager upon arrival at the train. The tenderer must incorporate the above into the maintenance methodology.

7.3.2.2. A 3-year maintenance and repair contract on the dental equipment is required.

7.3.2.3. Bidders are required to submit a maintenance methodology for the 3-year contract with their tender submission.

7.3.2.4. The maintenance methodology is deemed an essential returnable document required for scoring and must satisfy all requirements stipulated within this section of the specification.

7.3.2.5. The maintenance methodology will be tailored to the requirements of this specification and will encompass, amongst others, the following:

- Scheduled maintenance plan as recommended by the OEMs. This plan will also include all required daily inspections and/or maintenance to be performed by the operator/end-user.
- Work breakdown per maintenance activity as defined in the scheduled maintenance plan. This will include work done, parts, and consumables, as well as inspections, adjustments, and calibration, etc., where applicable.
- The location at which maintenance activities will take place, based on the locations in the provided train schedule in Annexure D.
- The OEM service/maintenance manuals (shared on award of the tender).
- Service provider accreditation certificate/s, as awarded by the respective OEMs.
- Specialized tools, spare parts and consumables per service activity.

- Estimated duration per service activities.
- Human resource/s required to perform the maintenance activities.
- Safety gear required to perform the required activities.

7.3.3 Maintenance and Repair Accreditation

7.3.3.1 Bidders are required to provide valid accreditation certificates from the OEMs to deem them qualified to perform maintenance and repairs on the products contained in this tender.

7.3.3.2 Bidders are to ensure that this accreditation is maintained for the duration of the contract.

7.3.4 Product Life Cycle

7.3.4.1 Bidders are required to provide the expected minimum product life cycle for each product as defined in Annexure A.

7.3.5 Response Time

7.3.5.1. Bidders shall adhere to a 1-day response time to maintenance and breakdown events.

8. COMPLIANCE

8.1. Act 101 of 1965: Medicines and Related Substances (latest)

8.2. ISO 13485:2016: Medical Devices – Quality Management Systems Required for Regulatory Purposes

8.3. SAHPRA Medical Device Establishment License

8.4. A complete clause-by-clause response shall be submitted to TE as part of the tender submission.

8.5. Any deviation from this specification shall be communicated to TE for review as part of the tender submission.

8.6. The tenderer shall submit a design proposal as part of the tender submission.

8.7. If necessary, tenderers will be invited to present the concept to TE technical team for clarification purposes.

- 8.8. Transnet Engineering's quality requirements as per PD_SES_NAT_QA_SPEC_0023 quality assurance specification must be adhered to at all times.
- 8.9. Any technical queries from the supplier shall be made through the procurement officer in charge.

9. WARRANTY

- 9.1. The tenderer must indicate the following in respect of warranties offered:
- 9.2. The tenderer will provide the terms and conditions of warranty of all products listed in Annexure A.
- 9.3. Mean time between failures
- 9.4. The OEM warranty period for all products listed in Annexure A.
- 9.5. Whether any specific product listed in Annexure A does not have an OEM warranty, the details of such products must be shared.
- 9.6. A 12-months warranty is required on all the products listed in Annexure A.
- 9.7. Whether the successful tenderer is prepared to reimburse Transnet Engineering in respect of labour costs arising from the rectification of makers' defects and, if so, to what extent and under what conditions.
- 9.8. If recurring failure of a specific component occurs more than three times within two years after commissioning of the equipment, Transnet Engineering could, after due consultations with the tenderer, declare such a component "inherently defective". The tenderer will then become liable for the re-design or replacement of the specific component(s) with superior components.
- 9.9. **The warranty of the equipment is to commence after the commissioning date and not the delivery date.**

ANNEXURE A: List of Equipment

Item No.	Item Description	Long text description	Qty
095853916	UNIT; DENTAL CHAIR/STOOL	UNIT; TYPE: DENTAL CHAIR/STOOL, APPLICATION: PHELOPHEPA; DENTAL CHAIRS/STOOLS UNIT WITH (SUCTION AND HANDPIECE STATIONS; USB CHARGING CONNECTION, THICKEN CHAIR FRAMES WITH TWO TREATMENT PROCESSES (PAINTING AND ELECTROPHORESIS; LED SENSOR WHITE&YELLOW LIGHT; AUTOMATICALLY WATER SUPPLY; STAINLESS STEEL FOOT SWITCH; STAINLESS STEEL HANDPIECE SPIRAL; ROTATING HANDPIECE HOLDER; SAFETY SWITCH ON/OFF; SILENT AND STABLE TAIWAN MOTOR, OR SIMILAR; MULTI-COLOR CHOICE, STURDY SHEET METAL BACKREST, DOUBLE ARMREST, WITH STANDARD SADDLE DENTAL STOOL	5
095853917	COMPRESSOR AIR;7 BAR,4 KW,0.75 KW,4 KW	COMPRESSOR, AIR; DISCHARGE PRESSURE: 7 BAR, POTENTIAL: 4 KW, DRIVER: SILENT OIL-FREE, POWER: 0.75 KW, CURRENT: 4 KW; APPLICATIONS: MEDICAL; TECHNOLOGY: PISTON; OPTIONS AND ACCESSORIES: OIL-FREE; FLOW: MIN.: 3.6 M ³ /H (127.13 FT ³ /H); MAX.: 35 M ³ /H (1,236.01 FT ³ /H)	2
095853918	UNIT; MOTORIZED SUCTION PUMP (DURR)	UNIT; TYPE: MOTORIZED SUCTION (DURR, OR SIMILAR), APPLICATION: PHELOPHEPA	2
095854016	DEVICE; DENTAL AUTOCLAVE/STEAM STERILIZER	DEVICE; TYPE: DENTAL AUTOCLAVE/STEAM STERILIZER, APPLICATION: PHELOPHEPA; BENCH TOP; INDICATOR LIGHT INDICATES WORKING STATE; FOR 4~6 MINUTES RAPIDLY STERILIZING; STERILIZING TEMPERATURE AND TIME CAN BE PRESET; STEAM-WATER INNER CIRCULATION SYSTEM: NO STEAM DISCHARGE, AND THE ENVIRONMENT FOR STERILIZING WILL BE CLEAN AND DRY; OVER TEMPERATURE&OVER PRESSURE AUTO-PROTECTION; SAFE PROTECTION OF WATER LACKING; EXHAUST THE COOL AIR AUTOMATICALLY; WITH THREE STAINLESS STEEL STERILIZING PLATES; THE CHAMBER OF THE STERILIZER IS MADE OF STAINLESS STEEL; AUTOMATICALLY SHUT OFF WITH BEEP REMINDING AFTER STERILIZATION	2
095854017	UNIT; WATER DISTILLER	UNIT; TYPE: WATER DISTILLER, APPLICATION: PHELOPHEPA	2
095854018	UNIT; DENTAL NEEDLE INCINERATORS	UNIT; TYPE: DENTAL NEEDLE INCINERATORS, APPLICATION: PHELOPHEPA; CORDLESS	5
095854019	LIGHT UNIT; CURING WIRELESS DENTAL	LIGHT UNIT; TYPE: CURING WIRELESS DENTAL; PHELOPHEPA, LED LIGHT	5
095854680	UNIT; ULTRASONIC/PEESOS SCALER	UNIT; TYPE: ULTRASONIC AND PEESOS SCALER, APPLICATION: PHELOPHEPA; ULTRASONIC SCALERS AND PEESOS SCALER) HANDPIECE WITH LIGHT. TECHNICAL PARAMETERS: POWER INPUT: 110V~50HZ/60HZ 200~240V~50HZ/60HZ MAIN UNIT INPUT: 24V~50HZ/60HZ 1.3A OUTPUT POWER: 3W~20W FREQUENCY: 28KHZ±3KHZ WATER PRESSURE: 0.1BAR~5BAR (0.01MPa~0.5MPa) MAIN UNIT WEIGHT: 0.65KG TRANSFORMER WEIGHT: 1KG DIMENSIONS: 188MMX159MMX 81MM	10
095854681	ROTOR; TURBINE HS FIBER OPTIC HANDPIECE	ANTI HEAT SYSTEM CELLULAR GLASS OPTICS CERAMIC BEARINGS CLEAN HEAD SYSTEM PUSH BUTTON CHUCK MICROFILTER EXCEPTIONAL DURABILITY SPECIFICATIONS: HEAD: MINIATURE HEAD GEAR RATIO: 1:4.5 FOR: FG BURS (DIAL.6)	10

Document name: Phelophepa Dental Equipment

Classification: External Use

Document serial number: 1621

Document owner: Product Development Coaches

Date: 29 June 2026

Document reference: PD-PDC-NAT-SPEC-0527

Revision: 3

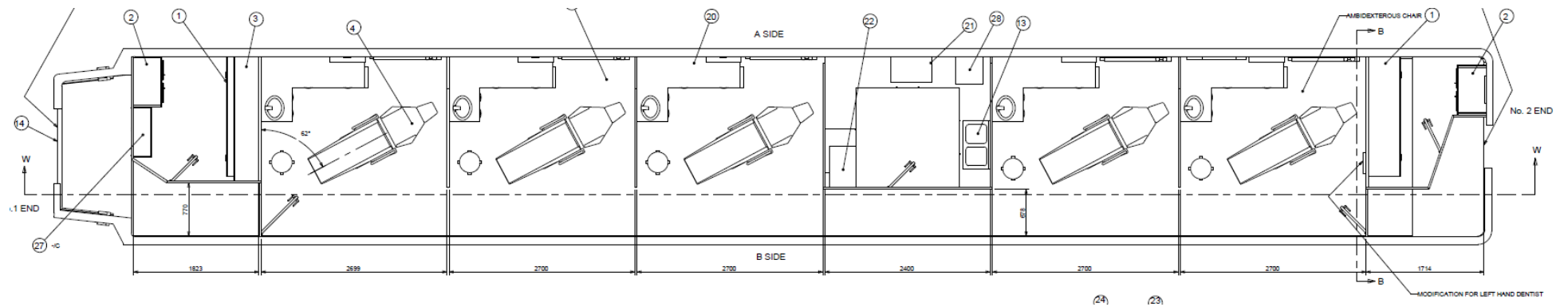
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		HEAD SIZE: H12.6 X Ø8.9 WATER SPRAY: QUATTRO SPRAY BODY MATERIAL: TITANIUM BODY COATING: DURAGRIP, OR SIMILAR MAX SPEED: 180,000 MIN-1 SHORT SHANK BURS ON	
095854682	UNIT;NSK-CONTRA-ANGLE-LOW SPEED	UNIT; TYPE: NSK CONTRA-ANGLE-LOW SPEED, APPLICATION: PHELOPHEPA; NSK (OR SIMILAR) CONTRA-ANGLE-LOW SPEED HANDPIECES AND AIR MOTOR LOW SPEED HAND PIECE FEATURES: LATCH TYPE X 3 HANDPIECES SPECIFICATIONS: GEAR RATIO: 1:1 DIRECT DRIVE FOR: CA BURS (Ø2.35) MAX SPEED: 30,000 MIN-1 AIR MOTOR: FEATURES: LED LIGHT 5,500 K COLOUR TEMPERATURE 20,000 RPM NON-LOAD SPEED LEFT AND RIGHT DIRECTION OF ROTATION 80G WEIGHT INTERNAL SPRAY	5
095854683	UNIT; NSK SURGICAL OPTIC HANDPIECE	UNIT; TYPE: NSK SURGICAL OPTIC HANDPIECE, APPLICATION: PHELOPHEPA; NSK (OR SIMILAR) SURGICAL OPTIC STRAIGHT HANDPIECE FEATURES: CELLULAR GLASS OPTICS CLEAN HEAD SYSTEM SPECIFICATIONS: GEAR RATIO: 1:1 DIRECT DRIVE FOR: HP BURS (Ø2.35) WATER SPRAY: EXTERNAL COOLING BODY MATERIAL: TITANIUM BODY COATING: DURACOAT MAX SPEED: 40,000 MIN	10
095854021	UNIT; DIGITAL DENTAL X-RAY/MONITOR	UNIT; TYPE: DIGITAL DENTAL X-RAY/MONITOR, APPLICATION: PHELOPHEPA	5
095854022	DEVELOPER; DIGITAL X-RAY,TREEDENTAL	DEVELOPER; TYPE: DIGITAL X-RAY, TRADE NAME: TREEDENTAL, OR SIMILAR; PHELOPHEPA	1
095854023	CAMERA DIGITAL;INTRAORAL	CAMERA, DIGITAL; TYPE: INTRAORAL; PHELOPHEPA	5

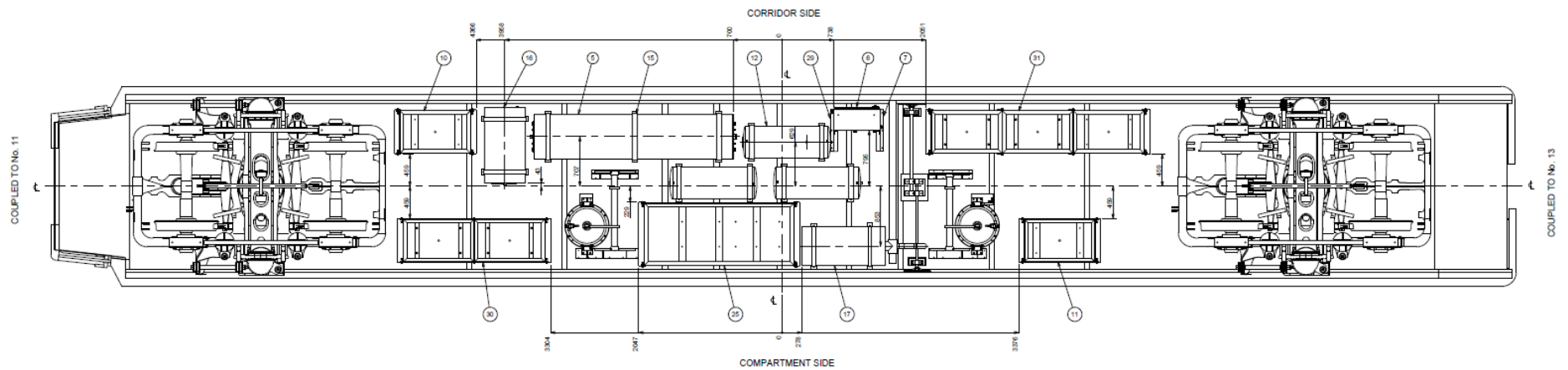
ANNEXURE B: Phelophepa Dental Coach Layout



Document name: Phelophepa Dental Equipment
 Classification: External Use
 Document serial number: 1621
 Document owner: Product Development Coaches
 Date: 29 June 2026

Document reference: PD-PDC-NAT-SPEC-0527
 Revision: 3
 Controlled and issued by: Configuration Officer
 Approved by: Principal Engineer (PSD-Coaches)
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ANNEXURE C: Phelophepa Dental Underframe Layout



Document name: Phelophepa Dental Equipment
 Classification: External Use
 Document serial number: 1621
 Document owner: Product Development Coaches
 Date: 29 June 2026

Document reference: PD-PDC-NAT-SPEC-0527
 Revision: 3
 Controlled and issued by: Configuration Officer
 Approved by: Principal Engineer (PSD-Coaches)
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ANNEXURE D: Phelophepa Train Schedule (Typical)

Phelophepa 1	
Province	Time Frame
Eastern Cape	20 January – 28 March
Free State	31 March – 30 May
Gauteng	2 – 27 June
North-West Province	30 June – 22 August
Western Cape	25 August – 17 October

Phelophepa 2	
Province	Time Frame
KwaZulu Natal	20 January – 28 March
Mpumalanga	31 March – 13 June
Limpopo	16 June – 8 August
Gauteng	11 August – 5 September
Northern Cape	8 September – 17 October