



ANNEXURE A

Mobile Wheel Lathe Machine User Requirement Specification



Mobile Wheel Lathe Machine User Requirement Specification

ROLE, POSITION & DEPARTMENT	NAME & SURNAME	SIGNATURE & DATE
COMPILED BY		
APPROVED BY		



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REVISION CONTROL

Revision No.	Date	Description	Revised by



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1 SCOPE

- 1.1 The works shall comprise all items of equipment necessary for the correct functioning of the Mobile Wheel Lathe Machine, whether specifically detailed in this specification or not.

2 PURPOSE

The Mobile Wheel Lathe Machine is required to re-profile wheelsets on PRASA's new fleet of rail vehicles and also any other types of existing Rolling Stock being maintained at the Rolling Stock Maintenance Depots.

3 BACKGROUND

- 3.1 The PRASA Traditional method of re-profiling of wheel treads of Metro motor and trailer coaches necessitates the removal of the worn, grooved or skidded wheelpair and dispatch to a Service provider's workshop for the necessary attention. The operation is time consuming and disruptive as the coach first has to be removed from the trainset and lifted in a back-shop.
- 3.2 With the introduction of the New Gibela supplied EM01 trains, this method of reprofiling and wheel maintenance were abandoned and replaced with the modern wheel maintenance regime by a Underfloor Wheel Lathe (UFWL). This will significantly improves the Maintainability of wheels within PRASA.
- 3.3 PRASA set out to provide all the maintenance facilities required for the new train through the Depot Modernization Program (DMP). This program includes the installation of UFWL's in all the operational regions.
- 3.4 Unfortunately, this DMP is currently severely delayed by at least 5 years. With 140 trains (with 3 360-wheelsets), already delivered by 2023, the maintenance of the new fleet was dependent on these facilities to be available.



- 3.5 Therefore, deliveries of the UFWL's are only expected within the next 5 years. By then almost the whole 600 set contract will be delivered. The expected wheel maintenance program (that is normally based on the wear rate) should kick in within this year leaving the new PRASA Rolling Stock completely unmaintainable. With the expected deliveries of new sets at a rate of 60 x 6 car train sets per annum, the lack of the wheel maintenance program WILL bring complete Metro service to a halt.
- 3.6 As an interim solution, and not to interfere with the DMP deliverable scope of work, is to provide each of the depots with a Mobile Wheel Lathe machines.
- 3.7 This Specification covers this interim requirement for a complete Wheel Maintenance Service for Metro Rolling Stock.
- 3.8 Despite being classified as interim, it is PRASA's requirement to provide complete Wheel maintenance capability to all regions and still comply with the tight tolerances and requirements for Wheel maintenance within.

4 STANDARDS

There are references throughout this specification to standards, which shall be used. The hierarchy of standards shall be such that South African National Standards (SANS, SABS) and Regulations shall be applied unless none exist whereupon the most appropriate standard such as International Standards Organisation (ISO), European (EN), British standards (BS), German, Deutsches Institut für Normung (DIN) Standards shall apply.



5 CAPABILITY OF THE MOBILE WHEEL LATHE MACHINE

5.1 The Mobile Wheel Lathe Machine shall offer the following functions, operations and features:

5.1.1 In-situ re-profiling of wheelsets on complete trainset modules (with the assistance of the purchased Synchronised Lifting Jacks).

5.1.2 In-situ re-profiling of wheelsets on uncoupled bogies (with the assistance of the Synchronised Lifting Jacks or Overhead Cranes).

5.1.3 Reprofile of single wheelset (with the assistance of the Overhead Cranes).

5.1.4 Capability of performing re-profiling on both wheels on a bogie wheelset simultaneously (with the assistance of the Overhead Cranes).

5.1.5 Automatic measuring and checking equipment integrated into the control of the Mobile Wheel Lathe Machine.

5.1.6 Swarf crusher and swarf disposal system.

5.1.7 Fume extraction system.

5.1.8 Facility for lifting coupled wheelsets to cater for service vehicles that may be fitted with coupled drives.

5.1.9 Machine Operations

5.1.9.1 Lathes

- Heavy Duty Mobile Wheel Lathe with adjustable dovetails & ways;
- Lathe utilizes 1 toolholder containing 1 insert;
- Automatic oil lubricated dovetails and way; and
- Each lathe consists of 1 X axis slide (left/right) & 1 Y axis slide (in/out).

5.1.9.2 Control Operations

- CNC Controls shall have:
 - Hardware and software used for operating the system;
 - User friendly process; and
 - Set-up and operation controlled with step by step color coded process.
- CNC Lathe shall have:
 - Robust features;
 - Touch screen;
 - Full operational keyboard;
 - Emergency Stop button; and
 - Automatic Toll Stop and Retract.



5.1.9.3 Machine Function

- Designed for mobile maintenance of Electrical Multiple Unit (EMUs)/ coaches/wagons/ locomotives wheels;
- Machining of worn wheelsets by re-profiling the wheels to required specifications and turning the profile to a nominal diameter by eliminating flat spots, shelling, high flanges and tread hollow; and
- Turns the wheels of the Rolling Stock without the need to remove the wheelset from the bogie and the bogie itself from the vehicle.

5.1.9.4 Wheelset Data

- Wheel Profile: Installation of multiple programs into control per customer request and specification to ensure the data is stored safely & reproduceable incase of analysis or investigation required.

5.2 The required Mobile Wheel Lathe Machine, can have the capability to carry out brake disc skimming for cheek mounted and/or axle mounted discs (Optional).

5.3 Machining operations shall be undertaken without the need to remove any fixed train components other than those items that prevent access from the side to the wheelset axle boxes.

5.4 The Service provider shall note that the installation of the wheel lathe will be undertaken in an operational railway maintenance depot environment.

6 SCOPE OF WORK

6.1 The preferred Service provider shall be responsible for the design, off-loading, installation, testing, training and commissioning of the Mobile Wheel Lathe Machine. Unless otherwise detailed or agreed, the Service provider shall undertake the following work:-

6.1.1 There shall be design reviews from the commencement of the project and PRASA Engineers shall be expected to sign-off project stages from the design phase to manufacturing, testing and commissioning and hand-over stages.



- 6.1.2 For any required civil work. Inspect and formally accept the installations, foundations and services provided by PRASA to the Service provider's requirements.
- 6.1.3 Provide and install the whole of the equipment specified in accordance with the drawings and specifications including all necessary foundation, bolts, CNC profiles, piping and supply of oils and greases.
- 6.1.4 Carry out all electrical work and wiring commencing at the electricity supply point.
- 6.1.5 Provide full details and all drawings of foundations (if required), services (electrical and air supplies) and installation requirements. Test certificates, operating and maintenance manuals, spare parts lists, certificates of competency as specified.
- 6.1.6 Undertake instruction and training of operating and maintenance staff.
- 6.1.7 Services of Staff for installation and commissioning of the Mobile Wheel Lathe Machine. The Staff shall have a good knowledge and understanding of the English, Language particularly technical terminology.
- 6.1.8 Services of Commissioning Engineer to return to site at appropriate times agreed after Handover.
- 6.1.9 Provide labour, tools, lifting tackle, craneage and scaffolding for off-loading, placing on site, storage and installation of all materials and equipment.
- 6.1.10 Sufficient tool tips for pre-handover machining.
- 6.1.11 A calibrated Test Wheelset for calibrating and setting up the Mobile Wheel Lathe Machine.
- 6.1.12 Wheelsets, from PRASA, to be used for carrying out trial runs of the Mobile Wheel Lathe Machine during commissioning.
- 6.1.13 Provide all drawings, test certificates, operating, maintenance and spares manuals and guarantee the Mobile Wheel Lathe Machine as specified.
- 6.1.14 Supply of 100 tool tips at handover.
- 6.1.15 Provide a full 1-year warranty from date of handover.



- 6.2 Where crange or other lifting equipment is deemed to be necessary to assist in the installation of equipment, this shall be provided by the Service provider. The Service provider shall be responsible for the following:-
- 6.2.1 Ensuring that the crane and lifting equipment/tackle has been regularly maintained and is covered by a current statutory test certificate.
- 6.2.2 Ensuring that the crane is positioned for working in such a manner as to render it safe for operation under 'safe working load' conditions.
- 6.2.3 Ensuring all persons involved in the lifting operations, including slinging and supervision, are competent to do so and have in their possession a current competency certificate.

7 DEFINITION OF TERMS

- 7.1 The following terms are used in this Specification and in order that the meanings are clearly understood, the definitions are given below:-
- 7.1.1 **Wheel Set**
An assembly comprising two wheels and one axle plus all components mounted between, including brake discs and gearboxes.
- 7.1.2 **Wheel Rim**
The whole of the wheel periphery from and including the chamfer or radius at the outer edge of the wheel up to the point of blending of the flange crown radius with the inside face of the wheel.
- 7.1.3 **Re-profile**
To machine a wheel or wheels on a wheelset to restore the wheel rim to its original profile or if so desired a new profile.
- 7.1.4 **Radial Run Out**
The variation in radius with respect to fixedpoint during one complete revolution about the datum axis without axial movement. Dimension T



when measured at the specified gauging plane D shown in **Appendix A**.

Radial runout is where the radius of the tire is not consistent from the wheel reference point on the rim.

7.1.5 Diameter Parity

The maximum permissible variation on diameter between one wheel and another on the same axle when measured at the specified gauging plane (dimension D of **Appendix A**).

7.1.6 Depth of Cut

The amount by which the radius of a wheel is reduced in a single cutting pass.

7.1.7 Section of Cut

The area of metal being removed at the point of cut (sq. mm.) derived from the depth of cut (mm) x feed rate (mm/rev).

7.1.8 Surface Finish

The specified limit of surface roughness and detailed in **Appendix A**.

7.1.9 Track Gauge

The distance between the inside running face of the track on which the vehicles run.

8 DESIGN AND PERFORMANCE REQUIREMENTS OF MOBILE WHEEL LATHE MACHINE

- 8.1 The Mobile Wheel Lathe Machine shall be designed to accept vehicles built to the vehicle gauges identified in the Appendices as attached. It shall accurately re-profile wheel sets fitted to rolling stock without the need to remove these wheel sets from the vehicle. The Mobile Wheel Lathe Machine must also be capable of machining wheelsets mounted in an uncoupled bogie, and single wheel sets. All wheel sets will be to **1065mm track gauge +5mm,-3m**.



- 8.2 The Mobile Wheel Lathe Machine shall be able to machine all wheels on a complete set of six cars (totalling 24 wheelsets) within a 24 hour (or 2 of 8 hour shifts) cycle.
- 8.3 The Mobile Wheel Lathe Machine shall be of rigid construction and capable of withstanding wheel loads of up to 300kN per axle. Trains of up to six cars in length (140 metres) shall be capable of remaining coupled whilst being re-profiled.
- 8.4 The Mobile Wheel Lathe Machine shall be capable of functioning within an ambient temperature band of -5 degrees centigrade to +40 degrees centigrade.
- 8.5 The Mobile Wheel Lathe Machine shall be capable of producing profiles to the accuracy's laid down in **Appendix A and B**.
- 8.6 The Mobile Wheel Lathe Machine shall be capable of machining both wheels of an axle and both axles of a bogie simultaneously to the accuracy's required up to a maximum reduction diameter of 20mm.
- 8.7 The wheel rim shall be re-profiled in a single pass. Where the required accuracy's cannot be obtained with maximum depths of cut the machining operation required to obtain the required accuracy's shall be stated.
- 8.8 Facilities or functionality shall be provided for the automatic determination of the profile wear of the two wheels with recommended reductions of Diameter Parity within tolerance, and with minimum metal removal on all four (4) wheelsets on a car.
- 8.9 The Mobile Wheel Lathe Machine shall be equipped with measuring devices to give diameter of each wheel a repeatable accuracy of 0.05mm. Means shall be provided to ensure that the device correctly locates the desired gauging plane of each wheel rim.
- 8.10 All measuring and setting equipment shall be calibrated in millimetre units.
- 8.11 The device shall be of robust construction requiring the minimum of recalibration. Periodicities and methods of recalibration shall be detailed in the returned tender.
- 8.12 The measurement devices shall be equipped with a data recorder system to enable recording of wheel set data to be performed. The Data System



shall be capable of transferring data from the Mobile Wheel Lathe Machine to PRASA's maintenance management system which will be Network PC based.

- 8.13 The machine shall be able to interface with the PRASA maintenance Management system to read the wheel profile information to allow paragraph 8.7 above to be performed.
- 8.14 The data received at PRASA's maintenance management system shall be capable of printing in the same format as the Mobile Wheel Lathe Machine.
- 8.15 Facilities shall be provided for obtaining wheel diameters if the primary system fails. Details of this secondary system shall be included in the returned tender.
- 8.16 The Mobile Wheel Lathe Machine shall be designed to minimise throughput time whilst achieving optimum re-profiling performance and as such will be equipped with a suitable range of tools, turning feeds and turning speeds to suit the range of wheel sets to be re-profiled.
- 8.17 The Service provider shall provide process times covering the range of diameters and materials with varying depths of cut up to the Mobile Wheel Lathe Machine maximum and stating the cutting speeds and feeds proposed. The machine shall be capable of producing profiles to the accuracy's laid down in **Appendix A and B**.
- 8.18 The Mobile Wheel Lathe machine shall have a **track gauge of 1065 +5mm, -3mm**.
- 8.19 It is expected that the MWLM be self-driven to move from one work position to another and align with the bogie. In the case where an external/ additional driving/shunting crawler will be needed, it is expected that this be provided in addition to the MWLM to provide full functionality. In the case where an additional crawler be provided, this will be an electric, battery driven machine.



8.20 Wheelset Drive

- 8.20.1 The drive shall be designed to enable profile irregularities to be accommodated without loss of transmission, torque or profile accuracy.
- 8.20.2 The drive shall be maintainable without the need for special tools.
- 8.20.3 An "anti-slip" system shall be incorporated in the drive.

8.21 Axle Box Centring

- 8.21.1 The preferred method of wheel centring is the axle box supported and held method. Occasions may occur when a vehicle design prohibits the use of this method; therefore the Mobile Wheel Lathe machine shall have the capabilities of alternative methods of wheel centring.
- 8.21.2 The Mobile Wheel Lathe machine shall be designed such that the centre line of the axle of the wheelset is maintained on the same centre line throughout the machining process. This shall be irrespective of ovality, eccentricity or wheel flats on the particular wheel. The Service provider shall provide full details of their proposal with their offer.

8.22 Hold Down / Clamping

- 8.22.1 Positive means shall be provided for locating the wheel set securely throughout the machining operation. The wheel set shall normally be supported and rotated about its axle bearings and provision must be made for restraining it during turning and measuring cycles by means of a powered hold down device.
- 8.22.2 The holding down device shall be provided to increase the axle load of the wheelset when the vehicle load is not sufficient for the machining operation. The holding down load shall be capable of adjustment to enable the axle load of lightweight vehicles to be increased to allow reasonable depths of cut/reduction of wheel diameter and turning times to be achieved.
- 8.22.3 The device shall be capable of exerting sufficient force such that the maximum depth of cut can be safely taken without inducing potential damage or risk to the vehicle or wheelset.



- 8.22.4 The hold down facility shall be capable of automatic traverse in both the vertical and horizontal planes to facilitate positive engagement of the axle box.
- 8.22.5 The hold down facility must be power raised/lowered, capable of swivelling, and under local control of the operator, to give clearance for vehicle movement on and off the Mobile Wheel Lathe machine.
- 8.22.6 Controls for raising/lowering of the axlebox supports shall be sited both adjacent to the axlebox supports and on the operating console at the normal operating position.
- 8.22.7 Indicator lights shall be provided to automatically show the hold down unit is clear of gauge and in its fully retracted position.

8.23 Axial/Lateral Support

- 8.23.1 The Wheel Lathe Mobile machine shall be provided with means to guide and stabilise the wheel set in the axial direction, and to support the wheel set against both axial and lateral forces that are present or induced during the cutting operation.
- 8.23.2 The normal maximum axial load to be applied by the axial guide roller shall be stated by the Service provider.
- 8.23.3 The hold down device shall incorporate claws/adapters to interface with the rolling stock axle boxes.
- 8.23.4 Claws/adapters shall be designed to positively locate with the axle box to prevent incorrect engagement, and shall be easily exchangeable without the need for special tools and must be clearly identified for each type of rolling stock.
- 8.23.5 Load indication shall be provided to establish the vehicle/wheelset load and the required load for machining.

8.24 Gauging

- 8.24.1 Profile gauging shall be provided and should be capable of gauging both wheel profiles simultaneously.



- 8.24.2 The profile gauge shall measure the wheel tread, throat and flange , and record the difference between the theoretical and actual worn profiles. Provision must be made for displaying both theoretical and actual profiles measured.
- 8.24.3 Diameter measuring shall be provided and shall be capable of measuring and recording both wheel diameters simultaneously. Provision must be made for displaying the measured diameters.
- 8.24.4 The profile gauging system along with the control system shall be capable of automatically establishing the minimum amount of material to be removed to restore the wheelset to the correct profile and a common diameter.
- 8.24.5 In addition to the above, it is expected that the MWL should be able to interface with the PRASA Maintenance Management system of Wheel Management system to determine the minimum cut required based on the wheel standards for a whole car as defined in **Appendix A**.
- 8.24.6 The Mobile Wheel Lathe machine shall be equipped with facilities to measure the lateral run out of each wheel dimension W of **Appendix A**. If the measurement device is by means of a dial gauge this shall be graduated in 0.10 large division units and be situated for ease of reading by the operator.
- 8.24.7 The Mobile Wheel Lathe machine shall be equipped with the facility to easily measure the back-to-back dimension of a wheel set within the range 980 to 1000mm.

8.25 Tool Slide and Tool Post

- 8.25.1 Manual operation of the tool post motions shall be provided for emergency purposes.
- 8.25.2 The tool post shall accommodate the cutting tool(s). The cutting tool(s) shall be capable of being replaced or repaired quickly and easily if broken, without requiring the removal of the wheelset.



- 8.25.3 The Service provider shall recommend the type of tooling best suited to the application of machining wheelset profiles as specified.
- 8.25.4 The cutting tools or inserts shall be easily obtainable through suppliers in South Africa and these suppliers shall be stated in the returned tender.
- 8.25.5 The Mobile Wheel Lathe machine shall be capable of returning to its pre-selected operating cycle following tool replacement or repair without having to be reset.
- 8.25.6 In the event of a power failure or emergency stop the tools shall be retracted automatically without causing any damage to the wheel set.

8.26 Swarf Crusher and Swarf Disposal System

- 8.26.1 Provision shall be made to cut/crush the swarf into manageable sized pieces.
- 8.26.2 The system shall be designed such that "balling" does not occur.
- 8.26.3 Any crusher shall incorporate a reverse motion that shall allow solid objects to be cleared and discharged with the crushed swarf.
- 8.26.4 All Swarf/ Cuttings /shavings will be managed in such a way that none are spilled at the work area. The storage capacity on the Mobile Wheel Lathe machine for the these cutting will be sized for holding at least the cuttings of 2-cars (4-wheel sets) and will allow for easy disposal and cleaning thereafter.
- 8.26.5 The control of both the crusher (stop, start, reverse) and the disposal system shall be selectable at the operating position. Any crusher shall be interlocked with the swarf disposal system and swarf guards such that the removal system must be running and safety guard system closed before the crusher can be started. Stopping of the swarf disposal/removal system and opening of the safety guard will also stop the crusher.
- 8.26.6 The swarf shall be disposed from the machine and discharged into a skip. Swarf shall be discharged in a safely manner not to endanger the maintenance personnel and damage any other equipment/facility in the workshop.



- 8.26.7 All moving parts of the crusher and conveyor shall be suitably enclosed and protected to prevent operator injury.
- 8.26.8 The conveyor controls located at the operator position shall be provided by the Service provider and shall consist of stop and start buttons and a light to indicate that the conveyor is running.
- 8.26.9 A swarf guidance system requiring no manual intervention shall be provided.
- 8.26.10 Mobile Wheel Lathe machine parts (i.e. hoses and cables) shall be suitably protected from the effects of any hot swarf being produced by the reproofing process.
- 8.26.11 The swarf cleaning and disposal mechanisms will dump all material into a mobile skip in a safe and controlled manner. Service Provider to provide details of this mechanism.

8.27 Fume/Dust Extraction

- 8.27.1 A self-contained dust/fume extraction system to extract airborne pollutants generated by the machining process and discharging them to atmosphere via filtration shall be provided.
- 8.27.2 Due cognisance must be made of all current legislation with respect of design, installation, and monitoring of localised exhaust ventilation extraction.

8.28 Lubrication System

- 8.28.1 An adequate system of lubrication and lubrication schedules shall be provided, fully described in the operating and maintenance manuals.
- 8.28.2 Provision shall be made for lubricating all moving parts. The lubricating points shall be easily accessible and where practicable grouped.
- 8.28.3 The requirements for lubricating oils and greases shall be rationalised to keep the number of different types of lubricant to a minimum. Any lubricants used shall be readily available in South Africa.



- 8.28.4 All equipment containing lubricant shall have a plate affixed to it giving details of the type of lubricant to be used.
- 8.28.5 Filters, fillers, drain plugs and gauges shall be readily accessible and shall be easily identified.
- 8.28.6 The Service provider shall note the requirement for the mandatory supply of all substances considered hazardous to health COSHH (Control of Substances Hazardous to Health) assessment information and Data sheets for all lubricants and other potentially hazardous material used on and in the Mobile Wheel Lathe machine.

8.29 Control System

- 8.29.1 The machining process shall be from a console separate from the machining area, whilst having safe and complete visibility of the process.

The Service provider shall demonstrate the need for minimal manual operator intervention.
- 8.29.2 The control system shall incorporate a means for storing and viewing records for each measured or machined wheelset. The data shall be stored in a format compatible with PRASA's maintenance management system (details of which are not yet available) or **Wheel management system (Miniprof)** and shall be capable of electronic transfer directly from and to that system which may print the data remotely. The Service provider shall state in what format and by which means such data may be transferred.
- 8.29.3 The control system shall include an integral menu driven, user friendly, faultdiagnostic system to aid the operator in diagnosing a Mobile Wheel Lathe machine failure or malfunction. Human Interfacing shall be considered during the design and layout of the controls to ensure as user friendly working environment as is practicable as possible.
- 8.29.4 The control system shall be equipped with a means to transfer stored data. The means of achieving this shall be fully described in the returned tender.



- 8.29.5 The control system shall permit data storage of at least 100 individual uniquely identified wheelsets. The Service provider shall state data storage capacity of the control system.
- 8.29.6 Wheelset data shall be automatically backed up such that data is not lost or corrupted in the event of a power failure. The Service provider shall advise the backup procedure.
- 8.29.7 Manual override of machining process shall be provided.
- 8.29.8 A minimum of four standard profiles shall be able to be stored within the CNC software with the facility to enter new profiles if required. The Service provider shall state the maximum number of profiles the software can store. The main profile to be employed will be Profile 22 Shown as **Appendix H**.
- 8.29.9 The control console shall display the process information in a concise and logical manner-taking cognizance of Human Interfacing and Operator/User friendly working environment.
- 8.29.10 Supplementary local controls shall be provided where control and supervision may be necessary during manual operations. Manual operations shall override automatic operation, with any intervention being recorded/indicated on the main control console, i.e. activation of emergency stop(s).

8.30 Remote Monitoring

- 8.30.1 The equipment shall be able to interface with Wheel management data already obtained from a remote measuring station via PRASA's maintenance management system or Wheel management system. A means of accepting this data shall be provided.
- 8.30.2 The Service provider shall recommend how the remotely obtained data may be used in the wheelset machining process.
- 8.30.3 The wheel lathe shall be configured such that remote access is available via a comms link so in the event of failure or maintenance breakdown, the Operator can communicate direct with the Supplier to minimise the time the Mobile Wheel Lathe machine is out of service.



8.31 Electrical Equipment

- 8.31.1 All electrical equipment supplied shall be in accordance with the requirements of the current edition of BS EN 60204 or known applicable South African standards and regulations.
- 8.31.2 The Service provider shall ensure that the whole of the electrical installation meets the requirements of The Electrical Machinery Regulations 2001, and SANS 10142-1:2006 (Ed 1.5) The Wiring of Premises Part 1: Low-Voltage Installations.
- 8.31.3 The electrical cabinets shall be dust-proof steel sheet casing, closed at all sides and mounted on a base frame preferably rated to IP 65.
- 8.31.4 The electrical cabinet shall comprise (but not necessarily limited to):
- a) A completely installed and wired control unit with the necessary contactors.
 - b) Input and Output modules for the control system,
 - c) The logic parts of the Mobile Wheel Lathe machine control system,
 - d) The feed and main drive control system,
 - e) Temperature control for the interior of the cabinet,
 - f) Service hour meter.
- 8.31.5 All electrical cabinets shall be fitted with interlocked isolators.
- 8.31.6 Emergency stop buttons shall be provided in positions readily accessible to the operator. The buttons shall be coloured red, suitably labelled and when actuated shall remain tripped until manually switched back to normal. Operation of an emergency button shall stop the Mobile Wheel Lathe machine (without causing damage) and also any ancillary equipment (i.e. swarf disposal system, crusher). Tripped emergency stop buttons shall be easily identifiable to the Operator.
- 8.31.7 Means of access to all live parts of every item of equipment shall have labels fitted to the outer surface stating "DANGER LIVE ELECTRICAL EQUIPMENT WITHIN".
- 8.31.8 All cable terminals and contactor relays shall be clearly labelled and corresponding to the completed schematic and wiring diagrams.



- 8.31.9 All adjustable relays, contactors, overloads shall be identified on the electrical drawings, diagrams and schematics shall show information regarding the contact setting for every adjustable element of the component.
- 8.31.10 All fuse holders shall be marked with the rating of the fuse to be fitted and the fuse rating of all fuses be shown on the electrical drawings, diagrams and schematics.
- 8.31.11 Fault light indication shall be provided on the control panel, with the facilities to test bulb status. All fault light indicators shall be long life standard LED bulb type construction. The lamps shall be easily sourced in South Africa or Europe.
- 8.31.12 Electronic Equipment shall conform to the relevant standards with recognition being given to the working environment.
- 8.31.13 All electrical equipment shall meet the requirements of South African Standards or where these do not exist to the standards hierarchy detailed in clause 3 i.e. the Electro-Magnetic Compatibility Directive, EN 61000-6-2: 2001 and EN 61000-6-4:2001.
- 8.31.14 Earthing of the equipment shall be in accordance with the appropriate South African Standards or where these do not exist to the standards hierarchy detailed in clause 3. e.g. BS EN 60204.
- 8.31.15 The Service provider shall provide details of Electrical loading for all of the equipment (i.e. Mobile Wheel Lathe machine, Swarf disposal system, and Crusher) and also provide details of the energy consumption.

8.32 Hydraulic System

- 8.32.1 Hydraulic systems shall generally be designed, manufactured and installed in accordance with applicable South African Standards or where these do not exist to the standards hierarchy detailed in Clause 4 e.g. BS 4575 or equivalent.



- 8.32.2 The equipment must be able to operate in the range of ambient temperatures specified in Clause 8.4.
- 8.32.3 Filters shall be fitted with permanent Condition Indicators.
- 8.32.4 An hour's run meter shall be provided, in a position where it can be easily read, which shall run whenever the Hydraulic power pack is operational.
- 8.32.5 Means shall be provided to enable the settings of adjustable components to be locked so as to prevent adjustment except by authorised persons.
- 8.32.6 Provision shall be made to enable the Mobile Wheel Lathe machine to return to a safe position following failure of the hydraulic system. Details to be provided by the Service provider.
- 8.32.7 Facilities shall be provided to allow the safe release of hydraulic pressure throughout the system to enable maintenance and repairs to be carried.
- 8.32.8 The maximum working pressure, including peak or test load pressures, for all hoses, pipework and fittings shall not exceed 25% of the burst pressure of the hose material.
- 8.32.9 Hoses shall be provided with cut resistant braided reinforcement covers suitable for the both the duty and environment in which they will be working.
- 8.32.10 Hose fittings shall be compatible with the hoses and shall be readily available within South Africa.
- 8.32.11 The radius of pipes shall not be smaller than that recommended by the manufacturer.
- 8.32.12 Filling orifices and indicators shall be legibly and indelibly marked with details of the contents of the related container. Filters fitted at the point of filling shall be provided where necessary to prevent the ingress of dirt.
- 8.32.13 Oil coolers shall be fitted where continuous operation of the Mobile Wheel Lathe machine would cause oil temperature problems.
- 8.32.14 Oil heaters shall be fitted where low oil temperatures at start of operations would cause problems.



- 8.32.15 Where necessary tank vents and breathers shall be fitted with breather bags to prevent ingress of airborne moisture to the hydraulic fluid.
- 8.32.16 Means shall be provided for complete draining of the hydraulic system. The method of draining shall be detailed in the returned tender.
- 8.32.17 All hydraulic equipment shall be easily identified, painted and colour coded accordingly with all the relevant details shown on drawings, schematics and maintenance literature.
- 8.32.18 A written sequence of operations shall be provided to be read in conjunction with schematic drawings for the safe functioning of the hydraulics.

8.33 Interlocks

- 8.33.1 The Mobile Wheel Lathe machine shall be fully interlocked such that no re-profiling/cutting of wheels activity shall proceed if there are unsafe conditions present in the environment.

8.34 Noise

- 8.34.1 The noise level on and around the equipment shall be the minimum attainable consistent with good engineering practice, but at no time shall the noise level exceed 85 dB(A) Leq at the operators ear when fully operational. The Leq cycle shall be 4 hours operating time per 8 hour shift. The Service provider shall provide details of anticipated noise levels with the returned tender.

8.35 Protection

- 8.35.1 All slides shall be protected from ingress of swarf or other foreign matter, by means of efficient seals or wipers.
- 8.35.2 All slideways of the Mobile Wheel Lathe machine shall be hardened and ground and suitably protected against the ingress of swarf and dirt.
- 8.35.3 Renewable strips shall be provided for all wearing slide faces.



8.36 Gears and Gearboxes

- 8.36.1 Gearboxes shall be provided with adequate facilities for inspection, oil filling, oil level indication and drainage. Space shall be available or means provided to satisfactorily drain the contents of the gearbox.

8.37 Bearings

- 8.37.1 The design of the equipment shall be such that the bearings can be replaced without excessive stripping down of the equipment.
- 8.37.2 All bearings shall be provided with suitable means of lubrication where there is a need for lubrication.

8.38 Surface Protection and Painting

- 8.38.1 All steelwork shall be completely welded, drilled, machined and thoroughly cleaned before any final surface treatment is carried out.
- 8.38.2 Surface preparation shall be in accordance with current applicable South African Standards or where these do not exist to the standards hierarchy detailed in Clause 3.
- 8.38.3 The Service provider shall carry out all painting in accordance with their standard processes; details of the painting process shall be included with the tender.
- 8.38.4 The Service provider shall make good on site, any damage caused to the paintwork, by shipment, off-loading and installation.
- 8.38.5 The durability of the paint shall be such that the finish will remain good for a minimum of 10 years, excluding accidental damage.
- 8.38.6 All pipework shall be painted and colour coded in accordance with the relevant South African Standards or where these do not exist or where these do not exist to the standards hierarchy detailed in Clause 3.

8.39 Labelling

- 8.39.1 All labels shall be permanently fixed to equipment. Lettering shall be legible and indelible.



- 8.39.2 All labelling shall be in the English Language to the satisfaction of the Engineer.
- 8.39.3 Labels shall not be fitted to covers and other removable parts unless they are non-reversible.
- 8.39.4 All components shall be clearly labelled to indicate their purpose.
- 8.39.5 Orifices provided for the purpose of filling storage tanks, vessels or pipelines shall be clearly labelled, so as to prevent the inadvertent filling with the wrong substance.
- 8.39.6 Safety signs and labels shall be fitted in accordance with South African Standards or where these do not exist to the standards hierarchy detailed in Clause 3. The Service provider shall submit details of the safety signs proposed to be fitted for approval of the Engineer.

8.40 Materials and Workmanship

- 8.40.1 The Service provider shall ensure that all materials supplied, are suitable for the environment in which they are to be used.
- 8.40.2 The material used, shall be the best of its kind for the purpose, conforming to current applicable South African Standards or where these do not exist to the standards hierarchy detailed in Clause 3.
- 8.40.3 Workmanship shall be of the highest standard possible, utilising best industry practice at all times.
- 8.40.4 The Service provider shall ensure that all works comply with the requirements of relevant statutory requirements and any South African railway industry standards current at the time.
- 8.40.5 A list of the legislation and railway industry standards relevant to the installation is shown in **Appendix I** to this specification. The list is provided for guidance only and the Service provider shall be responsible for identifying any other relevant standards or legislation.

8.41 Availability

- 8.41.1 The Mobile Wheel Lathe machine shall have a minimum 98% availability per year, taking account of maintenance and repair times only. The



Service provider shall provide calculation where necessary to show achievement of this figure and provide full details of repair and maintenance elements used in the calculation.

- 8.41.2 It is expected that with any major breakdown, the Service provider shall be able to repair the machine within 48 hours and have the necessary spares and capacity to perform these repairs. The Service provider shall provide methodology of how this will be attained.

8.42 **Service Requirements**

- 8.42.1 The electrical equipment shall be designed to operate from a 3 phase, 4 wire 50 Hz supply having nominal operating voltage of 400V.
- 8.42.2 The Service provider shall state the size of supply required, the maximum running current and the recommended size and type of device to protect the complete equipment.
- 8.42.3 All electrical equipment shall be adequately rated for its duty. All circuits shall be insulated; earth returns shall not be used.

8.43 **Accessories**

The Mobile Wheel Lathe machine shall be supplied with the following accessories:-

- 8.43.1 All hold down equipment and profiles required for the machining of profiles on the vehicles, bogies and wheelsets of the new fleet. (bogie and wheelset details will be supplied).
- 8.43.2 A minimum of four low voltage adjustable light units to aid operator visibility whilst setting up and machining the wheelset, and suitable lamps to light the control panel area.
- 8.43.3 A calibration wheelset for re-calibrating of the measuring systems and Mobile Wheel Lathe machine functions. The wheelset shall be clearly identified.
- 8.43.4 The calibration wheelset shall be provided with storage facility and suitable protection when it is not being used in order to protect from damage and atmospheric conditions.



- 8.43.5 The test wheelset shall be suitably marked with a unique identification number.
- 8.43.6 A test certificate shall be provided for the calibrated test wheel set certifying the accuracy, and also any other gauges or templates critical to the standard of accuracy of the machining operation.
- 8.43.7 A full set of inspection gauges to check the wheelset following re-profiling, including geometric shape for a single wheel and wheels across the axle (with Go No Go function), back-to-back gauge.

8.44 **Maintainability**

- 8.44.1 The design must give adequate consideration to both installation and replacement or exchange of major and minor components, sub-assemblies and major assemblies.
- 8.44.2 Topping up points shall be clearly marked and accessible to staff.
- 8.44.3 To facilitate servicing and maintenance, all items shall be readily accessible, but where fitted all covers shall, if possible, be hinged, with quick release catches and securing points for the opened position.
- 8.44.4 All removable panels shall be capable of being handled by one person.

8.45 **Safety**

- 8.45.1 The Operators position shall be designed such that he/she is remote from the cutting area thus preventing injury from contact with hot swarf.
- 8.45.2 The Service provider shall recommend and include if additional items of operator protection are required whilst operating the Mobile Wheel Lathe machine.
- 8.45.3 Warning lights shall be provided to indicate the status of equipment/systems during operation and confirm the position of Rolling Stock relative to the Mobile Wheel Lathe machine.

8.46 **Testing and Commissioning**

8.46.1 **General**

- a) Testing & Commissioning will ideally include each of the various vehicle



types to be machined on the wheel lathe as per defined in this specification.

- b) As a minimum this will include validating safe and effective interfacing between lathe and vehicle to the satisfaction of the Engineer.

8.46.2 **Factory Acceptance Testing (FAT)**

- a) When the equipment is ready for testing the Service provider shall inform PRASA that the equipment is fully complete and ready for a FAT to be undertaken.
- b) The Service provider shall give at least 2 weeks notice of the availability for the equipment to undergo FAT.
- c) During the FAT the Service provider shall demonstrate to PRASA's satisfaction the full functionality of the Mobile Wheel Lathe machine.
- d) It shall be the Service provider's responsibility to provide sufficient and suitable wheelsets in order to carry out the FAT.
- e) On satisfactory completion of the FAT PRASA shall issue a certificate of permission to deliver the equipment.
- f) The Service provider to arrange a site visit to one of the nearby Client/s for PRASA to witness the operation of preferable Mobile Wheel Lathe machine or any of the available Railway Wheel Lathe machines (Optional).

8.46.3 **Site Acceptance Testing (SAT)**

- a) When the equipment is ready for SAT, the Service provider shall inform PRASA that the equipment is fully complete and ready for a SAT to be undertaken.
- b) The Service provider shall give at least 2 weeks notice of the availability for the equipment to undergo SAT.
- c) During the SAT, the Service provider shall demonstrate to PRASA's satisfaction the full functionality of the Mobile Wheel Lathe machine.



- d) It shall be PRASA's responsibility to provide sufficient and suitable wheelsets in order to carry out the SAT.
- e) On satisfactory completion of the SAT PRASA shall issue a certificate of handover to accept the equipment ready for training and service.

8.47 Drawings

- 8.47.1 All drawings shall be produced in accordance with the requirements of South African Standards or where these do not exist to the standards hierarchy detailed in Clause 3.
- 8.47.2 All symbols on drawings shall be in accordance with South African Standards or where these do not exist to the standards hierarchy detailed in Clause 3.
- 8.47.3 A pipework schematic and wiring diagram shall be included in the operating and maintenance manuals.
- 8.47.4 The Service provider shall supply 3 complete sets of "As Built" drawings in hard copy format and electronic copies within 1 month of Handover.

8.48 Manuals

- 8.48.1 Manuals for the safe use and maintenance of the Mobile Wheel Lathe machine including parts lists, recommended spares and training requirements shall be supplied. The manuals shall be written to a high level of English language to the satisfaction of the Engineer.
- 8.48.2 The Service provider shall supply 3 sets of all manuals and other technical literature plus electronic copies within 1 month of Handover.

8.49 Training

- 8.49.1 Training shall be provided to a minimum of 3 operators (beginner and intermediate levels) and 3 maintenance personnel following commissioning and handover of the Mobile Wheel Lathe machine. Note as stated previously this could be up to a period of 12 months following Handover.



- 8.49.2 The training shall be carried out to enable the operating and maintenance staff to be proficient in the Re-profiling activities, fault finding and maintenance using all functions of the Mobile Wheel Lathe machine.
- 8.49.3 At the satisfactory completion of the training course the Service provider **shall issue a certificate of competency to the trained personnel.**
- 8.49.4 The Service provider shall advise with the returned tender a **synopsis of the training course content and duration.**

8.50 Information to be Supplied with the Tender

The Service provider shall include with the tender offer the following information:

- 8.50.1 A Clause-by-Clause response detailing compliance or otherwise and providing any information requested.
- 8.50.2 Outline layout drawings of Mobile Wheel Lathe machine and accessories.
- 8.50.3 Specification of the Goods and Services being offered.
- 8.50.4 Detailed drawings showing the pit and conveyor installations clearly defining the boundaries between the Service provider's work and that required from others.
- 8.50.5 Detailed drawing of foundation requirements including services and installation requirements (i.e. fixing and securing bolts).
- 8.50.6 Details of required power supply.
- 8.50.7 Details of all interlock arrangements.
- 8.50.8 Guarantee that the **performance criteria** specified will be met.
- 8.50.9 The Service provider shall provide a list of all bought out equipment together with part numbers, manufacturers name and address.
- 8.50.10 Full details of the proposed Data recording system.
- 8.50.11 A description of the tools required to carry out the machining operation together with anticipated tool life, current costs and recommended tool tip manufacturer.
- 8.50.12 Details of the paint process being applied.



- 8.50.13 A list of recommended spares holding for the first 1-year warranty period. The list shall clearly indicate spares required for each maintenance interval (based on planned maintenance schedule) with associated **labour** and **consumables** cost estimates. In addition, the Service provider shall provide a list of **normal replaceable** items related to unplanned maintenance with associated labour and consumables cost estimates.
- 8.50.14 A list of recommended spares holding for the first 5 years. The list shall clearly indicate spares required for each maintenance interval (based on planned maintenance schedule) with associated **labour** and **consumables** cost estimates. In addition, the Service provider shall provide a list of **normal replaceable** items related to unplanned maintenance with associated labour and consumables cost estimates.
- 8.50.15 Assurance of spares availability in long term (i.e. for period of 10 - 15 years after commissioning of equipment) and how it will be achieved.
- 8.50.16 Details of the maximum depth of cut that can be taken to obtain the required accuracy.
- 8.50.17 Details of quality control plan.
- 8.50.18 Details of the training with associated costs to be provided.
- 8.50.19 An example of a typical operating and maintenance manual detailing on maintenance intervals and related consumable and material required.
- 8.50.20 Critical spares definition based on matrix.

8.51 Information to be Supplied on Placement of Contract

The Service provider shall provide within 4 weeks of the placement of the contract the following information:

- 8.51.1 Full detailed layout drawings of Mobile Wheel Lathe machine and accessories.
- 8.51.2 Detailed drawings showing the railway track and conveyor installations clearly defining the boundaries between the Service provider work and that required from others.



- 8.51.3 Fully detailed drawing of foundation requirements including services and installation requirements (i.e. fixing and securing bolts).
- 8.51.4 Confirmation of required power supply.
- 8.51.5 A fully detailed list of recommended spares holding for the first 2 years with costs.
- 8.51.6 A fully detailed list of recommended spares holding for the first 5 years with costs.
- 8.51.7 Full details of assurance plan to ensure long term (i.e. 10 - 15 years period after commissioning) spares availability is achieved.
- 8.51.8 Full details of maintenance included in the initial 1-year warranty period with costs.
- 8.51.9 Full details of the recommended maintenance plan together with costs for a 1-year period.
- 8.51.10 Full details of quality control plan.
- 8.51.11 Full details of training to be carried out with included costs.
- 8.51.12 Testing and Commissioning Plans and Procedures.

8.52 **Method Statements**

- 8.52.1 The Service provider will be required to submit, to the PRASA, for approval, method statements detailing how the installation is to be carried out.
- 8.52.2 The method statements shall include, but not be limited to:
 - a) Description of activities covered by method statement.
 - b) Number of personnel involved.
 - c) Tools, plant & equipment to be used.
 - d) Safety procedures to be adopted.
 - e) Supervision arrangements and contact details.
- 8.52.3 No work will be allowed to be carried out on site without prior approval of a suitable method statement.

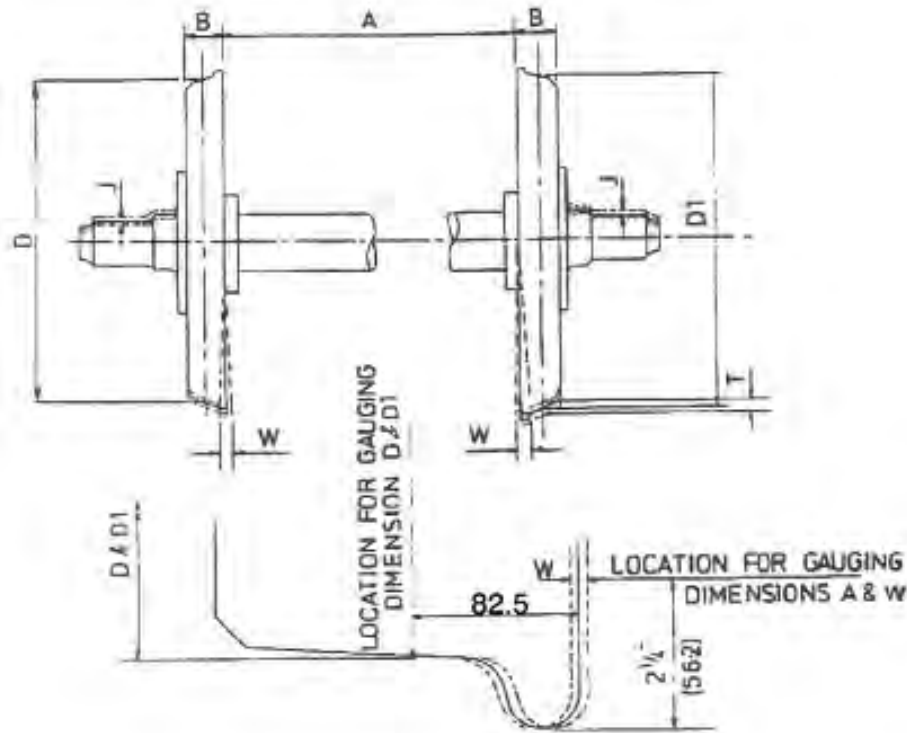


8.53 Preferred Duration

8.53.1 Preferred duration of the project is **48 months**.

APPENDIX A: DIMENSIONAL ACCURACY OF RE-CONDITIONED WHEELSETS

APPENDIX A: DIMENSIONAL ACCURACY OF RE-CONDITIONED WHEELSETS



Expected General Tolerances

Difference between D and wheels on the same axle	01 for 0.1 mm Max.
Difference between D and wheels on the same bogie	01 for 0.3 mm
Difference between D and wheels on the same vehicle	01 for 6mm Max.
Geometric shape	0.25mm Max.

Run out Tolerances

DIMENSION	TOLERANCE
T (Tread)	0.25mm Max.
W (inside face of individual wheels)	0.25mm Max.
Specified limit of surface finish	+ 500 CLA μ in/12.5M



APPENDIX B

APPENDIX B: B.1: REQUIRED DIMENSIONAL ACCURACY OF THE MOBILE WHEEL LATHE MACHINE, B.2: TYPICAL WORKING PARAMETERS OF THE MOBILE WHEEL LATHE MACHINE

B.1 REQUIRED DIMENSIONAL ACCURACY OF THE MOBILE WHEEL LATHE MACHINE

Peak-to-valley height Ra in brake disk machining.

Depending on feed:4..5 µm

Working accuracy during facing:..... 0_1 mm/200mm

B.2 TYPICAL WORKING PARAMETERS OF THE MOBILE WHEEL LATHE MACHINE

Minimum Tread Diameter	550 mm
Maximum Tread Diameter	1400 mm
Min Tyre width	80 mm
Max Tyre width	145 mm
Min Bogie Centre distance _ Coupled	7020 mm
Min Centre distance _ Uncoupled	13800 mm
Max Axle length	2700 mm
Min Axle length	2000 mm



APPENDIX C

APPENDIX C : C.1: TYPICAL VEHICLE DETAILS, C.2: GENERAL INFORMATION APPLICABLE TO ALL VEHICLES

C.1 NEW EMU TECHNICAL DETAILS

Bogie and Wheelsets characteristics and performance:

Track gauge	1065 +5/-3 mm
Customer Gauge	Respected
Max. operating speed	120 km/h
Axle load in M3	17 Tons
Wheelbase	2400 mm
Motor bogie mass	± 7800 kg
Trailer bogie mass	± 5200 kg

Bogie Wheelsets:

Wheels: Diameter 840/770

Monoblock forged wheels

P22 profile

Wheelsets:

Back to back distance = 990.6mm with 0/+1.6 tolerance

C.2 GENERAL INFORMATION APPLICABLE TO ALL VEHICLES

Minimum weight of single wheelset 1.5 metric ton

(where applicable)

Vehicle lengths 23520 mm Max
21000 mm Min

Distance between inside flanges of wheels Max 1000 mm
Min 980 mm



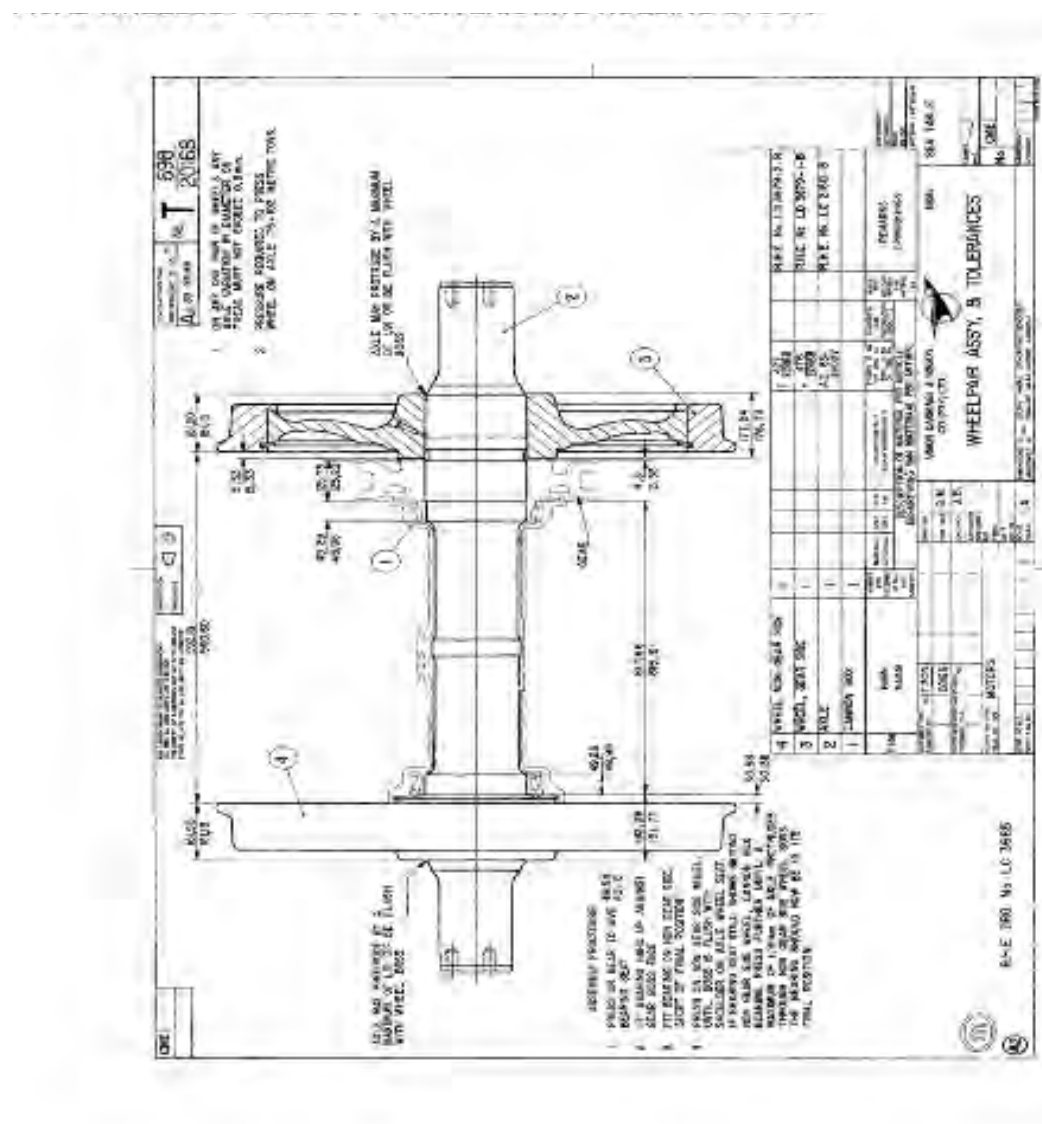
Wheel diameter	1400 mm Max
	550 mm Min
Wheel rim widths	145 mm Max
	80 mm Min
Axle loading	30 metric ton Max
	7.5 metric ton Min
Axle length	2100 mm Max
	1800 mm Min
Bogie Centres	15000 mm Max
	7000 mm Min
Bogie Axle Centres	2000 mm Min
	2500 mm Max

APPENDIX D

TYPICAL WHEELSET USED BY PRASA EXISTING ROLLING STOCK

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APPENDIX D: TYPICAL WHEELSET USED BY PRASA EXISTING ROLLING STOCK



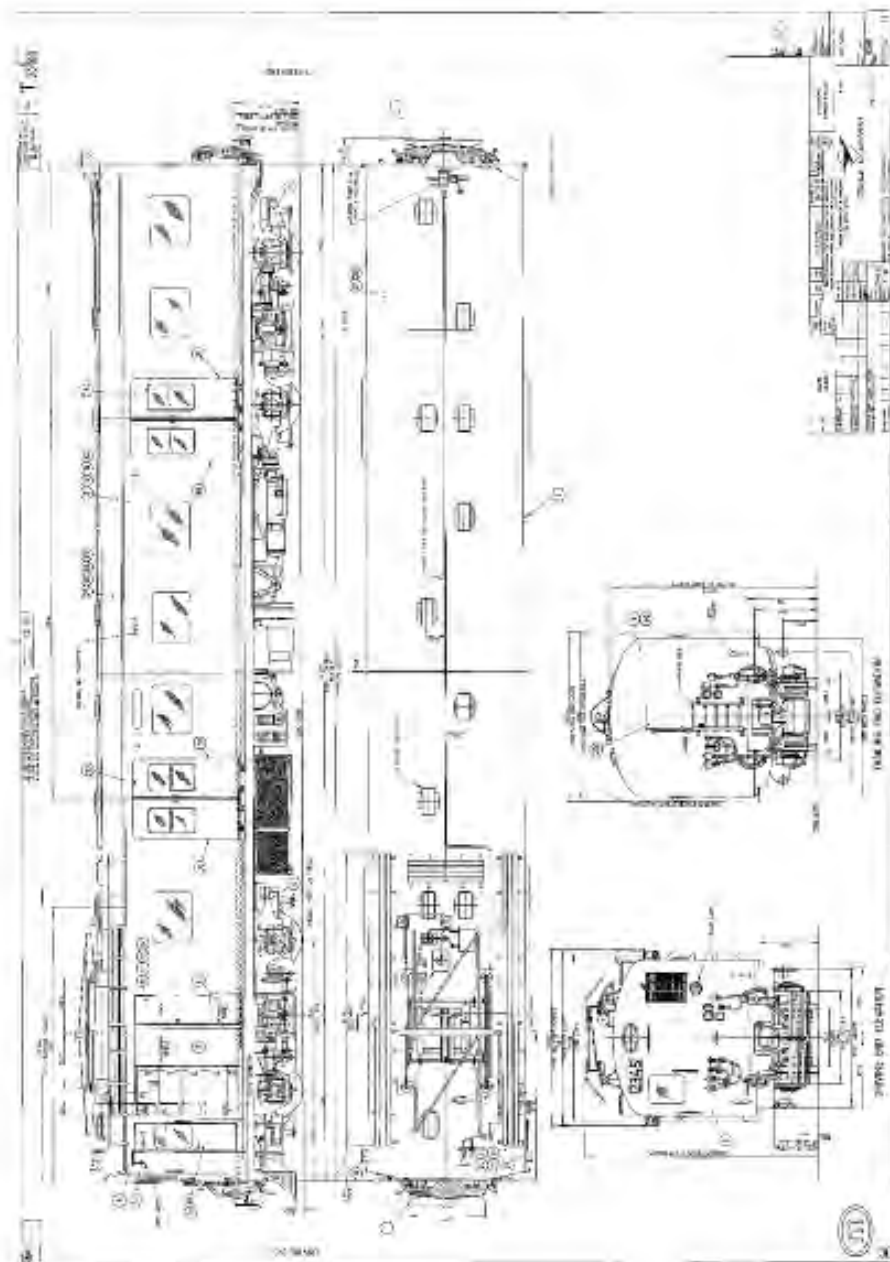


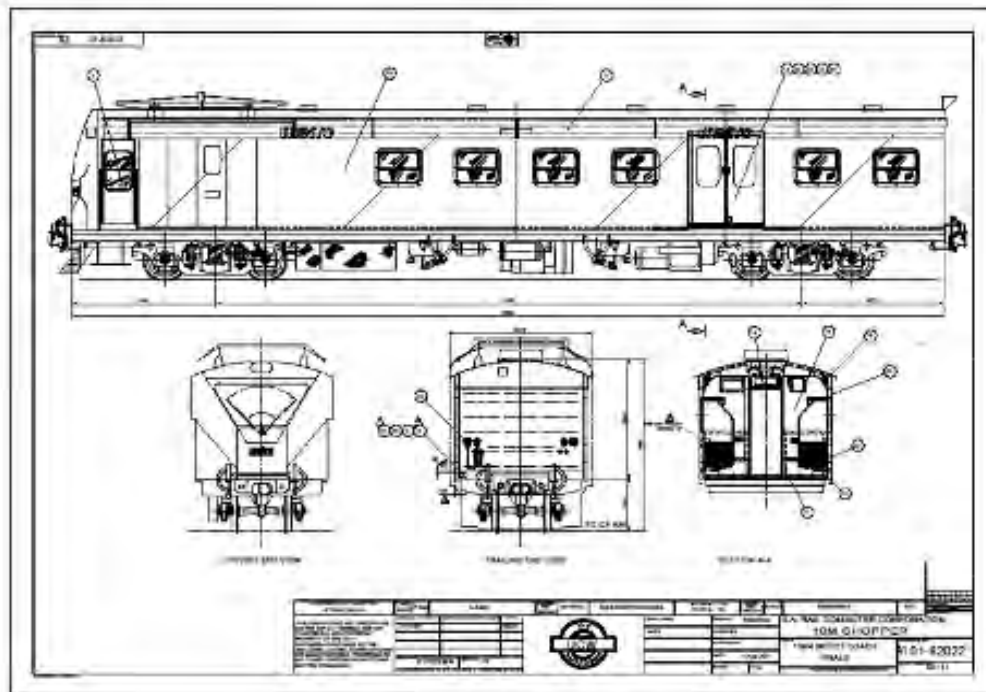
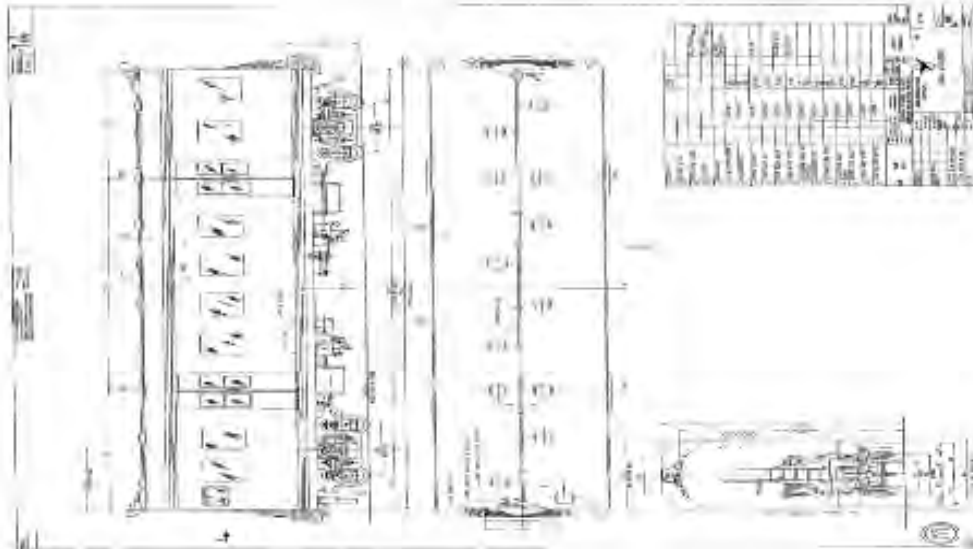
APPENDIX E

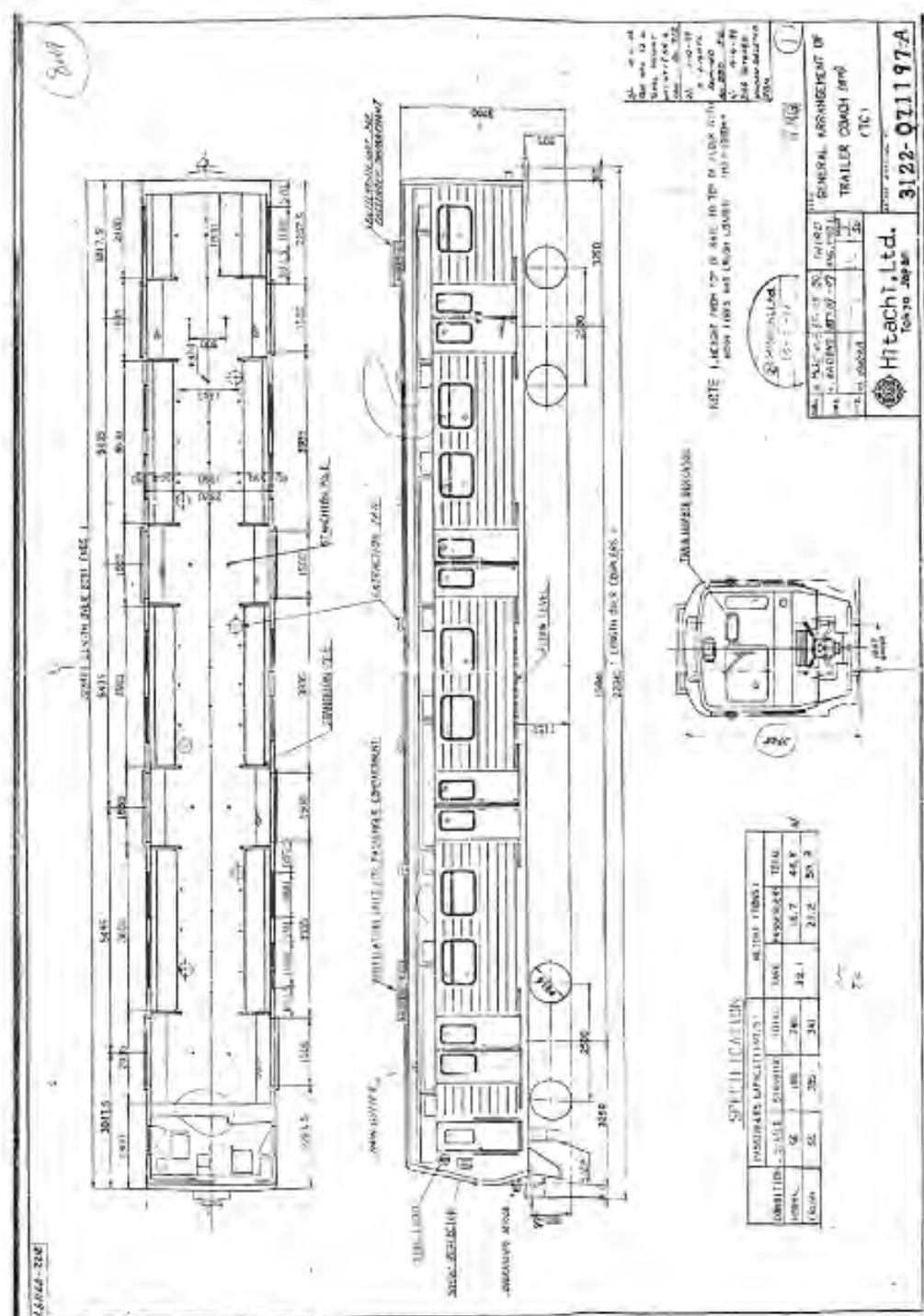
TYPICAL TRAIN DETAILS (GENERIC)

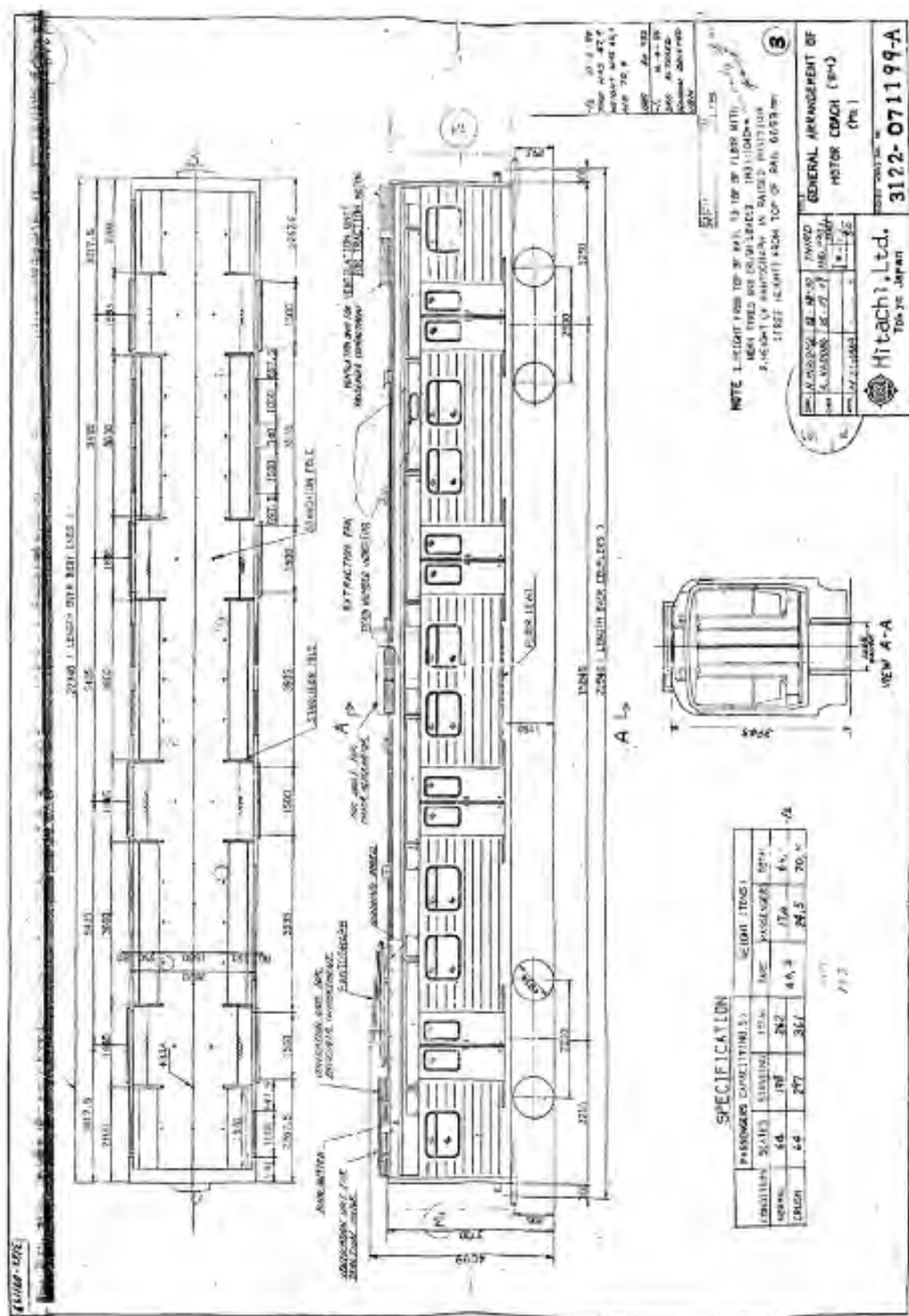
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APPENDIX E: TYPICAL DETAILS (GENERIC)









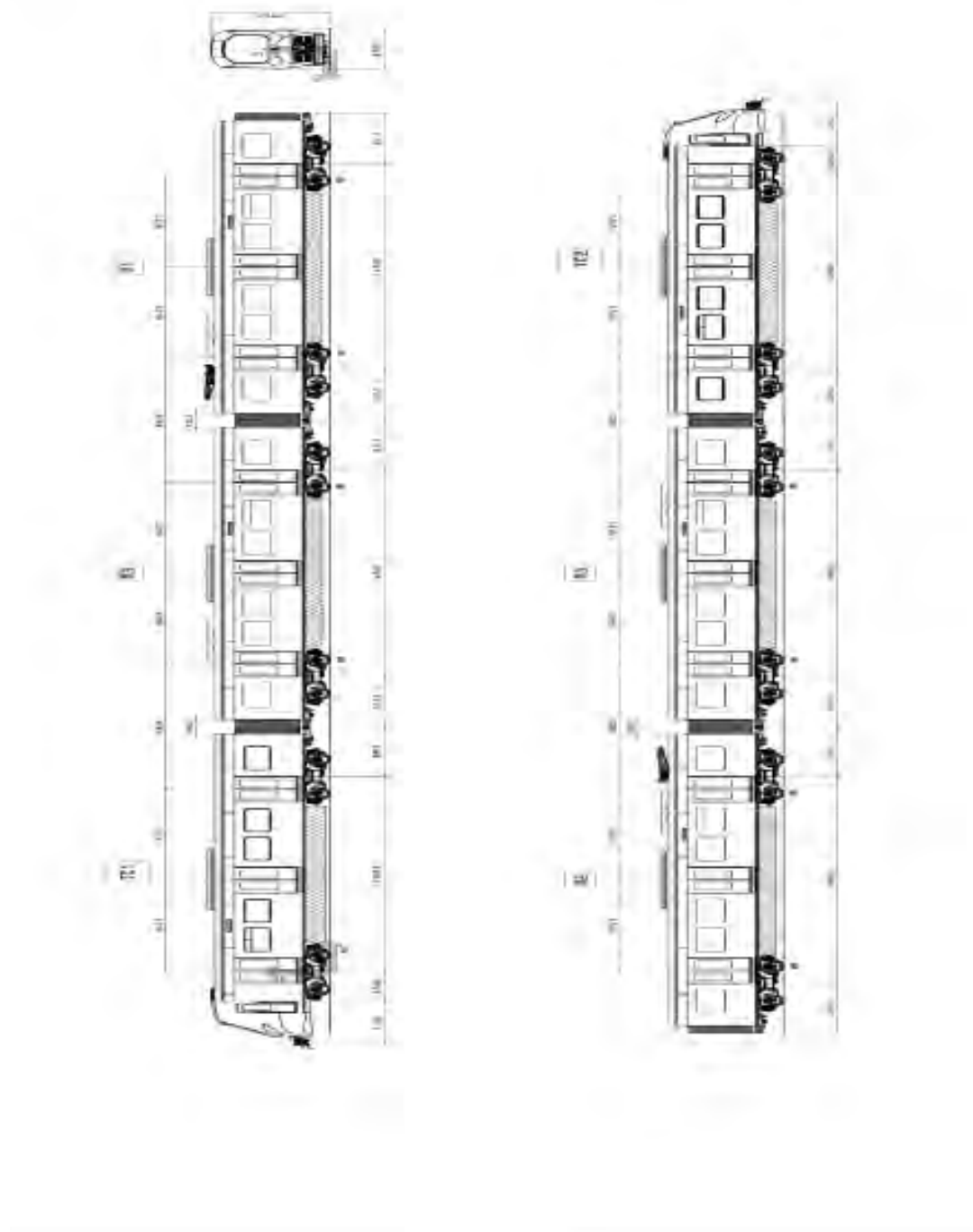


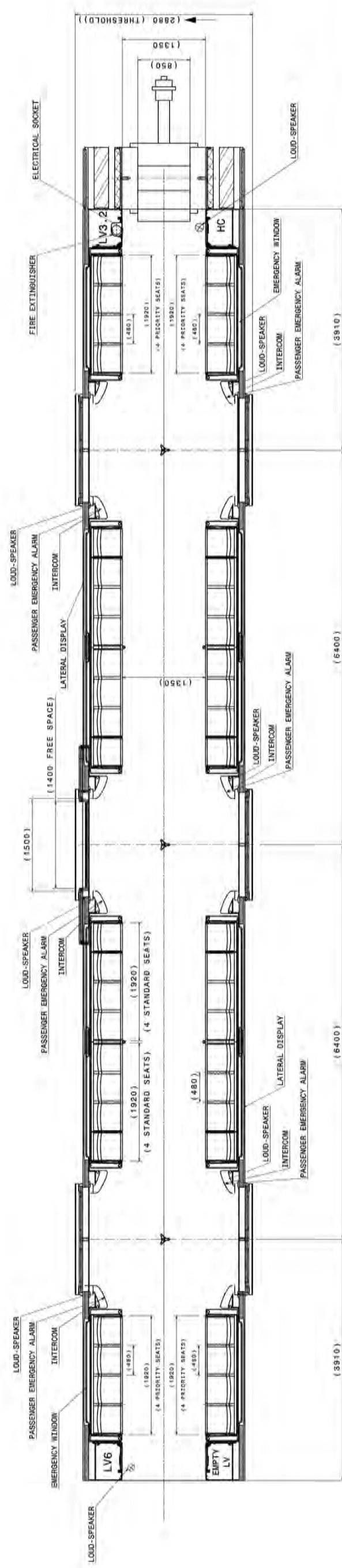
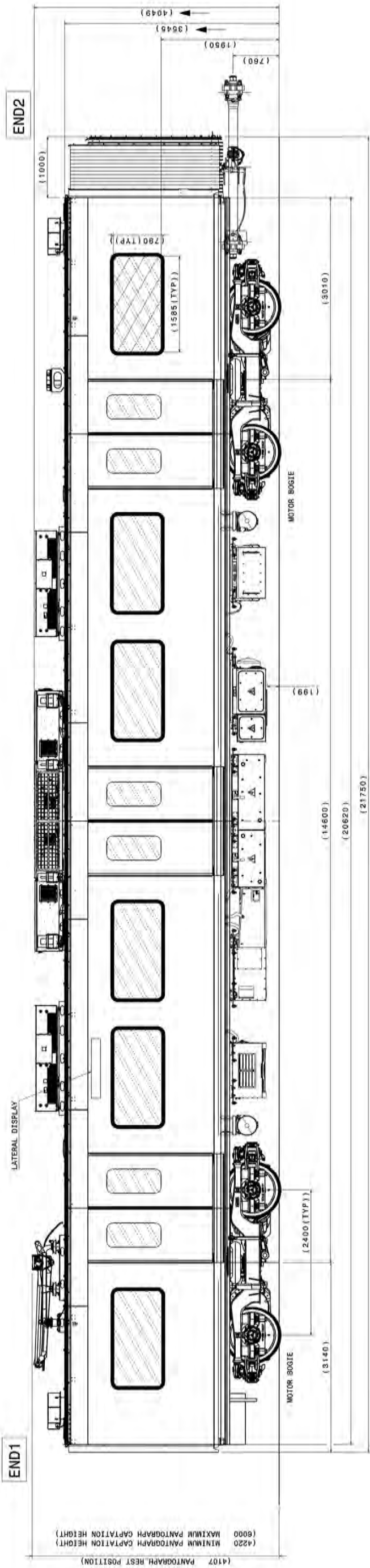
APPENDIX F

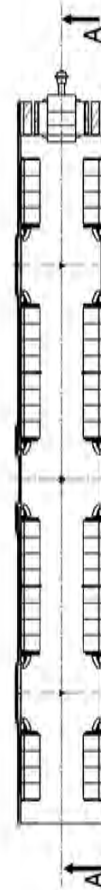
NEW ALSTOM-GIBELA VEHICLE

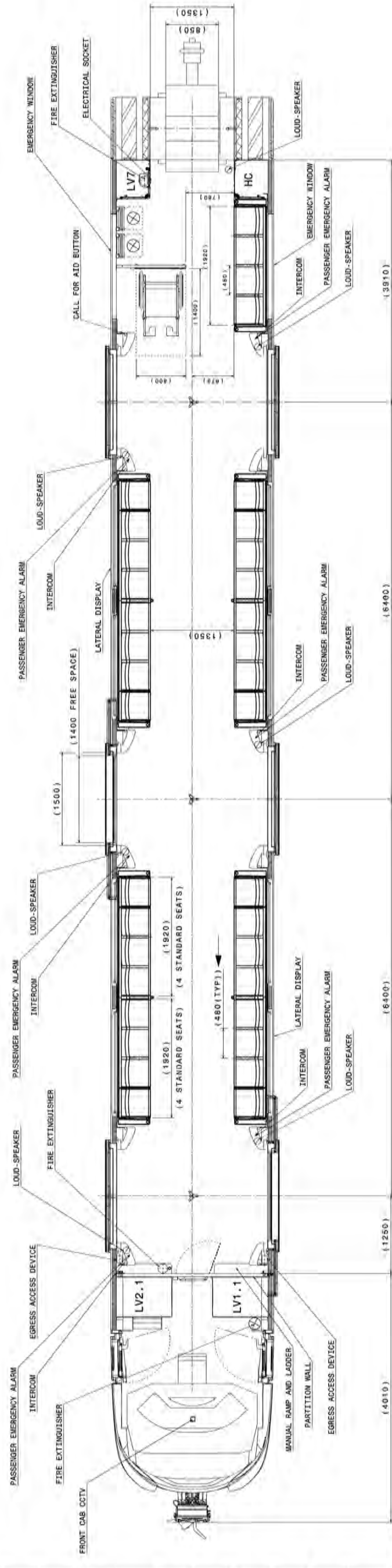
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APPENDIX F: NEW ALSTOM-GIBELA VEHICLE



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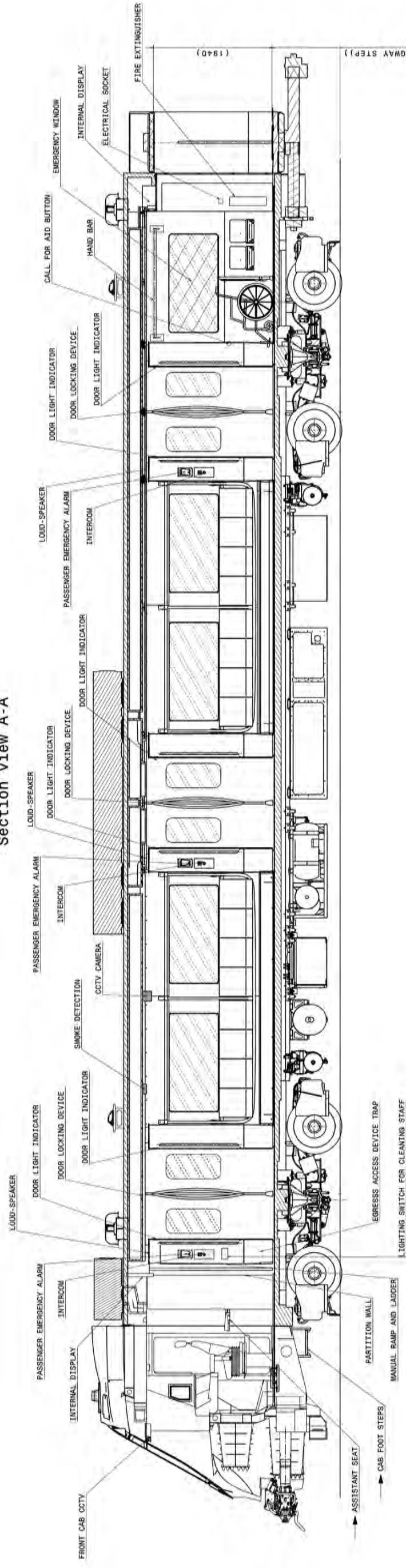
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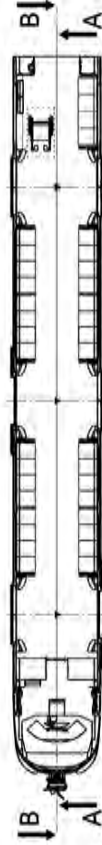
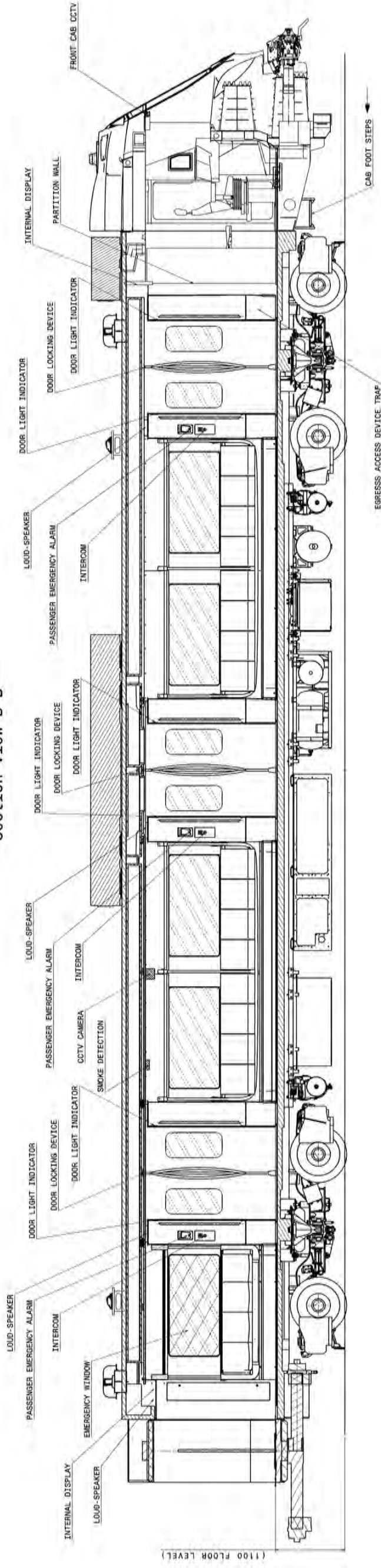
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99	10	1000	10/10/10	10/10/10
100	10	1000	10/10/10	10/10/10

Section view A-A



Section view B-B

[illegible]

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1

Age Group	Percentage of Respondents
18-29	85%
30-49	80%
50-69	75%
70+	65%

100

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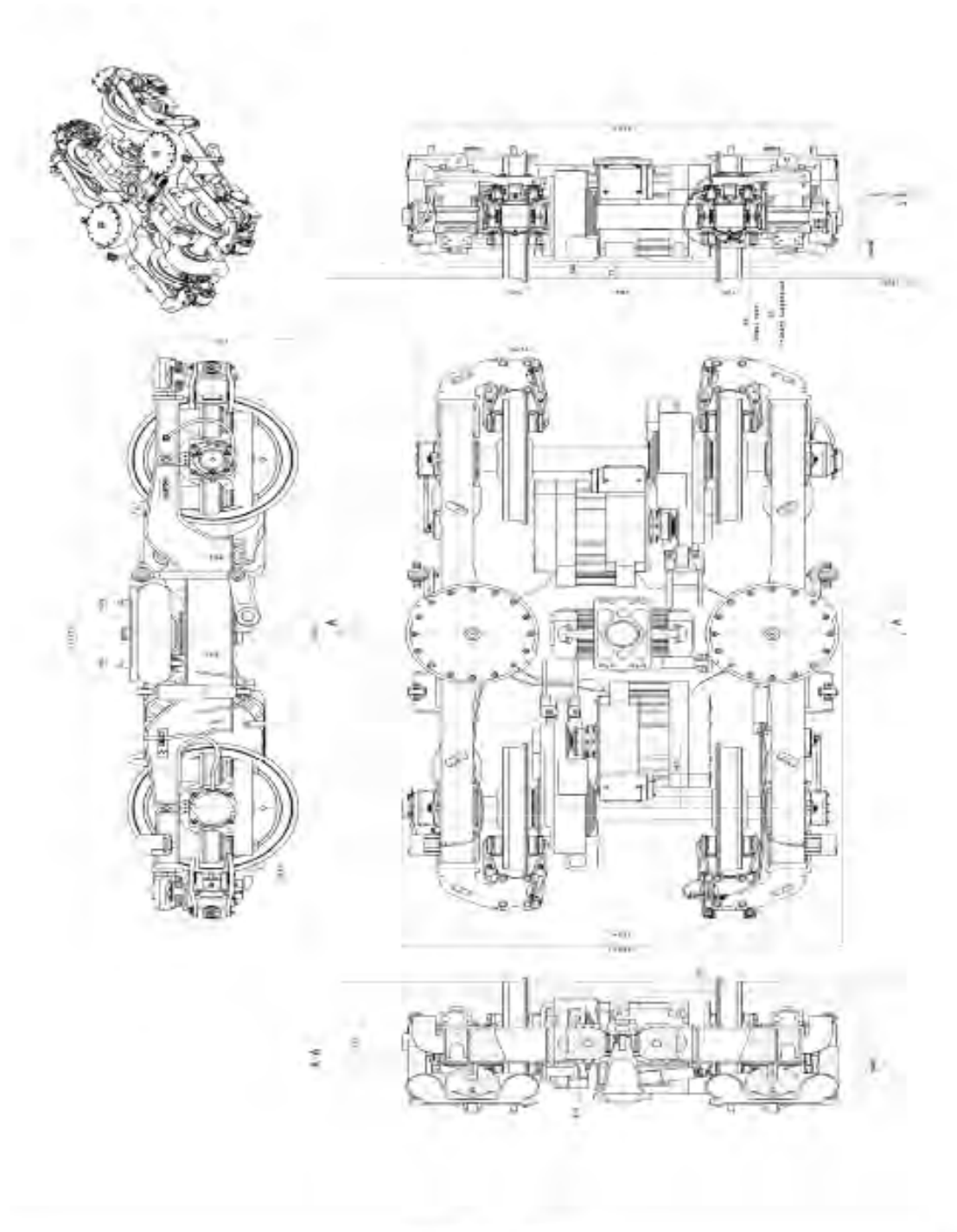


APPENDIX G

NEW FLEET BOGIE (ALSTOM-GIBELA)

(A3 Portrait Page is attached)

APPENDIX G: NEW FLEET BOGIE (ALSTOM-GIBELA)

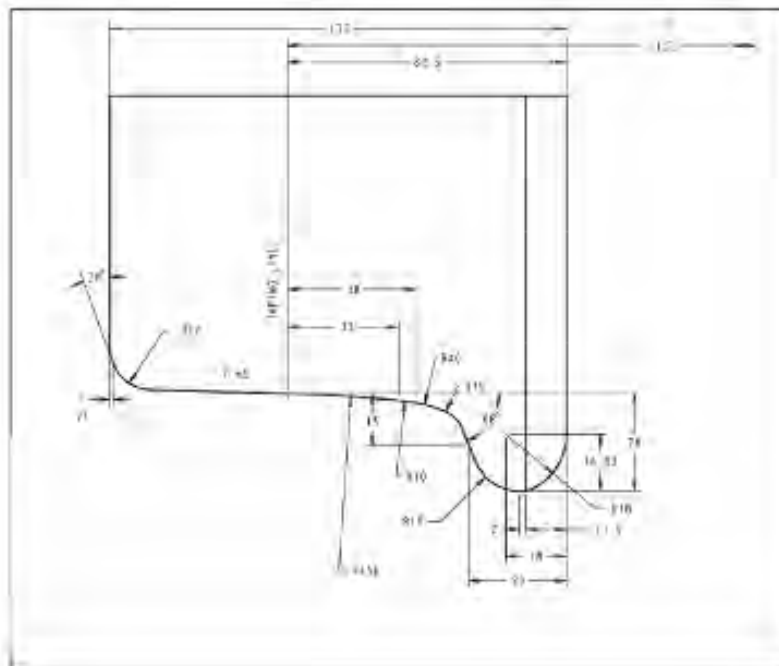


APPENDIX H

P22 WHEEL PROFILE

(A3 Portrait Page is attached)

APPENDIX H: P22 WHEEL PROFILE





APPENDIX I

APPENDIX I: I1: LIST OF GENERAL SA STANDARDS AND CODES, I2: GENERAL LEGISLATION AND RAILWAY STANDARDS, I3: BRITISH, EUROPEAN OR INTERNATIONAL STANDARDS

I.1 LIST OF GENERAL SOUTH AFRICAN STANDARDS AND CODES

I.1.1 General

- SANS 1921-1 2004 Construction and management requirements for works contracts Part
- National Building Act 103 1977 amended 1995(1993) OSH Act 85 of Local Bylaws Service providers Control Regulation
- SPK7/1 Specification For Works On, Over, Under or Adjacent To Railway Lines and Near High Voltage Equipment
- SPK7/2 General Conditions and Specification For Works On, Over, Under or adjacent To Railway Lines and Near High Voltage Equipment
- Occupational Health and Safety Act 1993
- SABS ISO 11200 SANS 11200: 1995 (ISO 11200 :1995) Acoustics - Noise emitted by machinery and equipment

I.1.2 Rail

- Act 16 National Railway Safety Regulator Act, 2002 (No. 16 of 2002) as amended
- SANS 3000-1:2009 Railway safety management Part 1: General

I.1.3 Electrical

- The latest issue of SANS 10142: "Code of Practice for the Wiring of Premises", The Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended,
- The National Building Regulations and Building Standards Act 1977 (Act 103 of 1977) as amended,
- The Electricity Act 1984 (Act 41 of 1984) as amended and SANS 05 Transport, handling and installation of electrical cables.



- SANS 10142-1:2006 (Ed 1.5) The Wiring Of Premises Part 1: Low-Voltage Installations
- SANS 13850 2012 Safety of machinery- Emergency stop - Principles for design (ISO13850:2006)
- SANS IEC 61000, SANS 61000-6 (EN 6100) Electromagnetic Compatibility
- SANS 60034-1 2004 (IEC 60034-1:2010) Rotating electrical machines Part 1: Rating and performance
- NRS 002 2000 Graphical symbols for electrical diagrams

I.1.4 Wheelset Re-profiling

RSE/TE/SPC/0045, Geometric Requirements for New, Re-profiled and in service Wheelsets.

I.2 LIST OF GENERAL LEGISLATION AND RAILWAY STANDARDS

- The supply of Machinery (Safety) Regulations 1992
- Factories Act 1961
- Offices, Shops and Railway Premises Act 1963
- Health and Safety at Work Act 1974
- The Building Regulations 1985
- Construction (Design & Management) Regulations 1994 Electricity at Work Regulations
- Control of Substances Hazardous to Health Regulations 1994 Confined Spaces Regulations 1997
- Lifting Operations and Lifting Equipment Regulations 1998 The Provision and Use of Work Equipment Regulations 1998
- The Railways and Other Transport Systems (Approval of Works, Plant & works).



I.3 BRITISH, EUROPEAN OR INTERNATIONAL STANDARDS

- **BS 5771** Requirements for electrical installations. IET wiring Regulations
- **BS 1134** Assessment of Surface Texture
- **BS EN 60204** Safety of Machinery, Electrical Equipment of Machines
- **BS EN 60529** Specification for degrees of protection provided by enclosures (IP code)
- **BS 4575-1** Guide for Application of Fluid Power Equipment to Transmission and Control Systems Part 1: Hydraulic Equipment
- **EN ISO 12100-1: 2003** Safety of machinery - Basic concepts, general principles for design - Basic terminology – Methodology.
- **EN ISO 12100-2: 2003** Safety of machinery - Basic concepts, general principles for design – Technical principles & specifications
- **EN 60204-1: 1993** Safety of machinery – Electrical Equipment of Machines - General Requirements
- **EN 61000-6-2: 2001** Electromagnetic Compatibility (EMC) – Generic immunity – Standard for Industrial Environment.
- **EN 61000-6-4: 2001** Electromagnetic compatibility (EMC) – Generic Standards – Emissions standard for industrial Environments.
- **DN 18800-1: 1990** Structural steelwork – design and construction.



**BIDDER'S CONFIRMATION OF COMPLIANCE TO THE USER
REQUIREMENT SPECIFICATION (URS) FOR THE MOBILE WHEEL
LATHE MACHINE**

NAME OF THE BIDDER :

**NAME OF THE
SIGNATORY - BIDDER'S
REPRESENTATIVE / :
DIRECTOR**

**COMPLIANT TO THE
USER REQUIREMENT
SPECIFICATION BY THE
BIDDER**

YES	☐	NO	☐
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[illegible]

[illegible]

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