



SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

**EXHIBIT II.B – GUIDELINES FOR PERMANENT TRACK AND OVERHEAD TRACTION NETWORK
VENTURES**

INDEX

PART I - MANDATORY GUIDELINES FOR PERMANENT TRACK AND OVERHEAD TRACTION NETWORK.....	4
1 OBJECTIVE	4
2 GENERAL PROVISIONS	4
3 STANDARDS, REGULATIONS AND LEGISLATION	6
4 TECHNICAL DOCUMENTS PROVIDED BY THE GRANTING AUTHORITY	8
5 SPECIFIC GUIDELINES FOR THE DESIGN AND CONSTRUCTION OF PERMANENT TRACK	8
6 SPECIFIC GUIDELINES FOR THE DESIGN AND CONSTRUCTION OF THE OVERHEAD TRACTION NETWORK (CATENARY)	29
7. PHASING OF WORKS – GENERAL	30
PART II – PERMANENT TRACK AND OVERHEAD TRACTION NETWORK VENTURES	32
1 VPM 001 VENTURE - RECOVERY OF THE PERMANENT TRACK OF LINES 11 AND 12, BRÁS / ESTUDANTES AND BRÁS / CALMON VIANA SECTIONS, RESPECTIVELY	32
2 VPM 002 AND RDA 001 VENTURE - LUZ TO BRÁS STRETCH.....	33
3 VPM 003 AND RDA 002 VENTURE - BRÁS TO SE ENGENHEIRO GUALBERTO STRETCH	35
4 VENTURE VPM 004 AND RDA 003 - STRETCH FROM ENGENHEIRO GUALBERTO TO CORINTHIANS-ITAQUERA.....	36
5 VPM 005 VENTURE - TUNNEL SECTION 3 TO GUAIANASES (KM 23+040 TO KM 24+800)	37
6 VPM 006 AND RDA 004 VENTURE - GUAIANASES TO SUZANO STRETCH	38
7 VPM 007 AND RDA 005 VENTURE - SUZANO TO STUDENTS SECTION	40
8 VENTURE VPM 008 AND RDA 006 - EXTENSION STUDENTS TO CESAR DE SOUZA	42
9 VPM 009 AND RDA 007 VENTURE - BRÁS A SE ENGENHEIRO GUALBERTO SECTION	43
10 VENTURE VPM 010 AND RDA 008 – STRETCH FROM ENGENHEIRO GUALBERTO TO ENGENHEIRO GOULART (12+800*)	44
11 VPM 011 AND RDA 009 - USP LESTE A ENGENHEIRO MANOEL FEIO	45
12 VPM 012 AND RDA 010 VENTURE – ENGENHEIRO MANOEL FEIO TO CALMON VIANA STRETCH.....	47
13 VPM 013 AND RDA 011 VENTURE - CALMON VIANA EXTENSION TO SUZANO	49
14 VPM 014 AND RDA 012 VENTURE - GUARULHOS AND BONSUCESSO AIRPORT STRETCH.....	50
15 VPM 015, 016, 017, 018, 019, 020 AND RDA 013, 014, 015, 016, 017, 018.....	52
16 VPM 021 AND RDA 019 VENTURE - LUZ COMPLEX.....	52
17 VPM 022 AND RDA 020 VENTURE - ENGENHEIRO SÃO PAULO SHELTER	53
18 VPM 023 AND RDA 021 VENTURE - TEST ROUTE.....	54
19 VPM 024 VENTURE – MAINTENANCE AND STORAGE BASE FOR BALLAST AND SLEEPERS	55
20 VPM 025 VENTURE – RAIL WELDING YARD.....	56
21 VPM 026 AND RDA 022 VENTURE – TRAIN WASHER.....	57
22 VPM 027 AND RDA 023 – PÁTIO CESAR DE SOUZA	59
23 VPM 028 VENTURE – METALLURGY MAINTENANCE BASE	60

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

24	VPM 029 AND RDA 024 VENTURE – ITAIM PAULISTA YARD.....	61
25	VPM 030 AND RDA 025 VENTURE – ENGENHEIRO MANOEL FEIO YARD	62
26	VPM 031 VENTURE – CALMON VIANA BASE	62

PART I - MANDATORY GUIDELINES FOR PERMANENT TRACK AND OVERHEAD TRACTION NETWORK

1 OBJECTIVE

- 1.1. This document aims to establish the specific mandatory guidelines for the preparation of the PERMANENT TRACK and OVERHEAD TRACTION NETWORK projects, aiming at the implementation of the modernization and improvement construction works for the SERVICES of LINES 11, 12 and 13 and AIRPORT EXPRESS.

1.1.1. The general mandatory guidelines for projects and BIM are regulated in EXHIBIT II.A.

2 GENERAL PROVISIONS

- 2.1. The design of engineering projects must follow the general mandatory guidelines provided for in EXHIBIT II.A and specific mandatory guidelines of this EXHIBIT.

- 2.2. In addition to the projects, the CONCESSIONAIRE must prepare the construction method, detailing each phase of the construction work implementation, remembering the close interface between the systems dealt with in this EXHIBIT and other EXHIBITS. This detailing must contemplate the correct dimensioning of labor, equipment and supply of materials, in order to generate the least possible impact on the circulation of trains, considering:

2.2.1. The guarantee of the continuity of commercial operation and on all service fronts must maintain two tracks available for the circulation of trains during the execution of the works, except in less critical sections, where it will be possible to partially or totally interdict the tracks during the day or operational, as stated in PART II of this EXHIBIT;

2.2.2. The appropriate analyses and solutions for the operational interfaces and interfaces with the other systems (electrical, electronic, signaling, telecommunications, energy, rolling stock and others);

2.2.3. For the identification of the VENTURES, the use of 3 (three) capital letters was adopted, followed by 3 (three) sequential numbers, per action, as shown in Table 1, where the PERMANENT TRACK and OVERHEAD TRACTION NETWORK VENTURES of LINES 11-Coral, 12-Safira and 13-Jade are indicated.

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

Table 1: VENTURES FOR THE PERMANENT TRACK AND OVERHEAD TRACTION NETWORK

IDENTIFICATION AND NUMBERING TABLE OF VENTURES					
PART	LOCAL	STRETCH (km)	LINE	PERMANENT TRACK (VPM)	OVERHEAD TRACTION NETWORK (RDA)
TRAFFIC ROUTES					
1	Infrastructure and superstructure recovery	L11: Km 2+140 to 50+770 L12: km 2+140 to 41+040	11 12	VPM 001	-
2	Stretch Luz - Brás	0+000 a 2+240	11	VPM 002	RDA 001
3	Stretch Brás – SE Engenheiro Gualberto	2+240 a 8+500	11	VPM 003	RDA 002
4	Stretch SE Eng. Gualberto – Corinthians Itaquera	8+500 to 19+450	11	VPM 004	RDA 003
5	Stretch Tunnel 3 - Guaianases	23+040 to 24+800	11	VPM 005	-
6	Stretch Guaianases - Suzano	24+800 to 36+940	11	VPM 006	RDA 004
7	Stretch Suzano - Estudantes	36+940 to 50+770	11	VPM 007	RDA 005
8	Extension Estudantes – Cesar de Sousa	50+770 to 55+115	11	VPM 008	RDA 006
9	Stretch Brás – SE Engenheiro Gualberto	2+240 a 8+500	12	VPM 009	RDA 007
10	Stretch SE Engenheiro Gualberto – Engenheiro Goulart (km 12+800)	8+500 to 17+200	12	VPM 010	RDA 008
11	Stretch USP Leste – Engenheiro Manoel Feio	17+900 to 33+150	12	VPM 011	RDA 009
12	Stretch Engenheiro Manoel Feio – Calmon Viana	33+150 to 41+140	12	VPM 012	RDA 010
13	Extension Calmon Viana - Suzano	34+550 to 36+940	12	VPM 013	RDA 011
14	Stretch Guarulhos Airport – Bonsucesso	25+500 to 35+600	13	VPM 014	RDA 012
STATIONS					
15	Bom Retiro	2+100	11	VPM 015	RDA 013
16	Lajeado	25+627	11	VPM 016	RDA 014
17	Itaquaquecetuba	35+301	12	VPM 017	RDA 015
18	Jundiapéba	42+398	11	VPM 018	RDA 016
19	Mogi das Cruzes	49+158	11	VPM 019	RDA 017
20	Estudantes	50+641	11	VPM 020	RDA 018

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

IDENTIFICATION AND NUMBERING TABLE OF VENTURES					
PART	LOCAL	STRETCH (km)	LINE	PERMANENT TRACK (VPM)	OVERHEAD TRACTION NETWORK (RDA)
MAINTENANCE COMPLEXES AND PARKING YARDS					
21	Luz Complex	0+600	11	VPM 021	RDA 019
22	Eng São Paulo Shelter	3+900	11	VPM 022	RDA 020
23	Test Path	-	11	VPM 023	RDA 021
24	Ballast and Sleeper Maintenance and Storage Base	-	11	VPM 024	-
28	Rail Welding Yard	-	11	VPM 025	-
29	Washer	-	11	VPM 026	RDA 022
30	Cesar de Souza Courtyard	54+900	11	VPM 027	RDA 023
31	Metallurgy Maintenance Base	-	12	VPM 028	-
32	Itaim Paulista yard	28+850	12	VPM 029	RDA 024
33	Eng. Manoel Feio yard	32+400	12	VPM 030	RDA 025
34	Base Calmon Viana	33+800	11	VPM 031	-

2.2.4. Below are observations related to the table above:

- i. The km of the Cesar de Souza Station (VPM 008 and RDA 006) of LINE 11-Coral was obtained based on the geometric project.
- ii. Km 12+800 (VPM 010 and RDA 008) is located between the Engenheiro Gualberto and Engenheiro Goulart substations and corresponds to the limit of the modernization works of the LINE 12-Safira tracks, carried out in conjunction with the implementation works of LINE 13-Jade.
- iii. Km 41+140 of Calmon Viana (geometric layout of LINE 12-Safira) - VPM 013 and RDA 011 - corresponds to km 34+550 of the same station following the geometric layout of LINE 11-Coral. As the extension of LINE 12 follows the route of LINE 11-Coral, the mileage of LINE 11-Coral was adopted as a reference.

3 STANDARDS, REGULATIONS AND LEGISLATION

- 3.1. The VENTURES must be designed, supplied and executed in accordance with the technical and performance requirements established in the AGREEMENT, embodied in this document, with the rules and regulations of the agencies listed below and with the regulations and legislation at the municipal, state and federal levels, in force at the time of the implementation of the VENTURES.

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- 3.2. Whenever the technical and performance requirements established by the documents of the PUBLIC NOTICE are more restrictive than those stipulated by the aforementioned standards, these must be considered.
- 3.3. In cases of differences between standards, which may generate doubts or conflicts regarding the prescriptions for the same object, the most restrictive rule will prevail, that is, in favor of safety and durability.
- 3.4. When the standards are omitted or there is no specific mention, other standards of national or international agencies may be used, as long as they have public faith and recognized authority, which guarantee a supply of quality not inferior to that achieved with the aforementioned standards. In this case, the rules used must be provided to ARTESP in Portuguese or English, for its non-objection.
- 3.5. All safety and accident prevention standards and regulations in force in Brazil must be respected.
- 3.6. The rules must be considered in their current versions, when preparing the projects.
- 3.7. The projects must be developed in accordance with the Standards of the Brazilian Association of Technical Standards - ABNT, Technical Instructions, contained in APPENDIX 1 of this EXHIBIT and other standards applicable to the services in question. For the preparation of the project and in the phases of its realization, in the absence of standardization by ABNT, the following standards may be used:

AREMA - American Railway Engineering and Maintenance of Way Association;
ASTM - American Society for Testing Materials;
UIC - Union Internationale des Chemins de Fer ;
ERRI - European Rail Research Institute;
DIN - Deutsche Industrie Normen;
ISO - International Standard Organization;
AASHTO – “American Association of State Highway and Transportation Officials”;
AISI – “American Iron and Steel Institute”;
AISC – “American Institute of Steel Construction”;
ANSI – “American National Standards Institute”;
AWS – “American Welding Society”;
BSI – “British Standards Institution”;
CEN – “Comité Européen de Normalisation”;
IEC – “*International Electrotechnical Commission*”;
NFPA – “National Fire Protection Association”.

- 3.8. All standards used must be in Portuguese or English. Other standards of recognized authority may be adopted, which guarantee a supply of quality not inferior to that achieved with the

aforementioned standards, with the non-objection of the GRANTING AUTHORITY.

4 TECHNICAL DOCUMENTS PROVIDED BY THE GRANTING AUTHORITY

4.1. Below is the list of technical documents provided by the GRANTING AUTHORITY in APPENDIX I of this EXHIBIT.

Table 2: TECHNICAL DOCUMENTS PROVIDED BY THE GRANTING AUTHORITY

DOCUMENT	TITLE
AD2141-0 and sheets (1,2,3,4)	PERMANENT TRACK OBSTACLE GAUGE FOR FIXED INSTALLATIONS
AI0347-4	OBSTACLE GAUGE FOR THE CONSTRUCTION OF FIXED INSTALLATIONS – LINE A, B, C, D, E and F
AK7803-1	GEOMETRIC DESIGN OF THE PERMANENT TRACK LAYOUT
AM0856-3	CARBON STEEL AND ALLOY STEEL RAIL SUPPLY
AO2973-0	UIC-60 RAIL PROFILE
AQ6407-0	DUAL CUT TRACK
AQ6408-9	DUAL TRACK LANDFILL
AS1783-7	CONCRETE SLEEPER GAUGE ON UICA RAIL – DISTANC. BETWEEN SHOULDER PADS
AS1786-1	CONCRETE SLEEPER GAUGE ON UICA RAIL – DISTANC. BETWEEN EXTERNAL SHOULDER PADS
AS1895-7	PRESTRESSED CONCRETE MONOBLOCK SLEEPER RAIL UIC-60 GAUGE 1600 mm
NS. GAF/001	ISSUANCE OF TECHNICAL DOCUMENTS

5 SPECIFIC GUIDELINES FOR THE DESIGN AND CONSTRUCTION OF PERMANENT TRACK

Depending on the parameters established in the technical documents in Table 2 or to be prepared for the PERMANENT TRACK, in the detailing of the projects and definition of the construction method, the condition of execution of the infrastructure and superstructure works must be taken into account without totally interrupting the circulation of trains on the different service fronts defined for LINES 11, 12 and 13. Once this condition is established, the following are the specific guidelines that the CONCESSIONAIRE must consider in the preparation of the project for the adaptation and/or construction of the PERMANENT TRACK.

5.1. Geometric design of the PERMANENT TRACK

- 5.1.1. The project consists of the consolidation of the existing railroads, in the improvement studies, such as the optimization of the current LCD, increase in speeds and other adjustments regarding their local relocation, gaining speed, less wear of material, adaptation to the new criteria and operational data. The solutions adopted should later be incorporated into the functional logic of the new signaling system to be implemented on the roads.

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

5.1.2. The geometric project must be prepared based on the cadastral planialtimetric topographic survey of the lines, considering the guideline speed of 90km/h, gauge of 1600mm, and the calculation methodology is in accordance with the guidelines contained in the technical specification AK7803-1. In addition to defining the appropriate geometry for the roads, the geometric design aims at the following issues:

- Optimize the current geometric layout of the railways;
- Perform adjustments that result in improvements to the operational circulation of the stretch;
- Optimize the current LCD (LCD's) or implement new ones, aiming to increase speed on them and/or improve operational strategies;
- Adjustments that result in improvements to the operational circulation of the stretch;
- Adequacy of the new project criteria and operational data;
- Minimization of wear and tear of the materials used in the superstructure;
- Reduce maintenance interventions on the PERMANENT TRACK.

5.1.3. Within the adaptation projects, the following objectives must be achieved:

- Introduce minimum radius compatible with the guideline speed;
- Reduce the number of radii in compound horizontal curves;
- Use transition curves appropriate to the new track geometry;
- Employ superelevation compatible with train speeds;
- Reduce vertical tilt changes;
- Employ appropriate vertical concordances for rail traffic.

5.1.4. During the development of the projects, the alternatives that will support their development must be preliminarily tested in order to guarantee the expected performance for each SERVICE.

5.1.5. In the development of the project, the restrictions imposed must be respected,

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

observing the guidelines contained in document AD2141-0 "Permanent Route Obstacle Gauge for the Construction of Fixed Installations", available in APPENDIX 1 of this EXHIBIT II.B.

5.1.6. The geometric layout must be carried out in accordance with the guidelines of Technical Specification AK7803-1 "Geometric Design in the Lines" available in APPENDIX 1 of this EXHIBIT II.B.

5.1.7. The project basically consists of the following documents:

- Drawings, calculation memorials, descriptive memorials, standard projects, technical report, topographic and coordinate tables and document indexes;
- The geometric layout of the road should cover the entire section, where the notable points of the road should be launched within the coordinate system;
- The horizontal and vertical implantation plans must indicate the new geometric layouts and the cadastral planialtimetric topographic survey, as well as must be compatible with the BIM model, according to the guidelines of EXHIBIT II.A.

5.1.8. Each projected notable point should be characterized by:

- Corresponding number or name;
- UTM coordinates in the CPTM reference system (SIRGAS 2000 - 23 SUL) for topographic landmarks and local coordinate system with reference to USP pillar 1 for BASIC and EXECUTIVE PROJECTS;
- Mileage from ground zero CPTM (Luz Station);
- Distance between notable points and topographic landmarks;
- Elevation at the top of the billet of the baseline reference rail (axis of one of the lanes);
- Superelevation.

5.1.9. Typical cross-sections for different situations should be drawn up, containing the following data:

- Section validity (of mileage);

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- Definitions of drainage works;
 - Works in the areas of slopes, hillsides, cuts, embankments, and others ;
 - Presence and relocation of pipes and various ducts;
 - Interference;
 - Position and foundation of the topographic landmarks of notable and secondary points;
 - Adjustments to the free passage and obstacle templates;
 - Wheelbase of the tracks;
 - Track superstructure, with its components (sleepers, rails and ballast);
 - Section of the infrastructure containing the level of the water table, the morphologies of the soil and other proposals for its correction (reinforcement of the support layer);
 - Details of the geometric design of the roads, especially in curved regions, where the elevations of the roads and their superelevations should be contained;
 - Posting, its foundation and OVERHEAD TRACTION NETWORK;
 - Primary and secondary topographic landmarks;
 - Sealing of the right-of-way.
- 5.1.10. The longitudinal profile must be designed according to the axis of the track defined as the "base line", indicating the points of vertical agreement and identification of the slope of the ramp (i%), following the convention adopted in vertical projects.
- 5.1.11. For the implementation of the new geometry of the track, the implementation plan must be presented, indicating the planned construction stages, each one of them, in addition to the phases and executive operations themselves, the complete details of the speeds, temporary deviations (lines, crossings, LCD's and others) that may be necessary to guarantee the normal circulation of the trains and the definition of the conditions of full speed.
- 5.1.12. For the main construction elements of the track geometry layout, the provisions of

Technical Specification AK7803-1 Geometric Design on Lines, available in APPENDIX 1 of this EXHIBIT II.B, must be observed.

5.2. BASIC PROJECT

5.2.1. The development of the BASIC PROJECT of PERMANENT TRACK involves the following disciplines:

- i. Cadastral planialtimetric topographic survey;
- ii. Geological and geotechnical studies;
- iii. Hydrological studies;
- iv. Basic projects for slope containment and protection;
- v. Basic drainage projects, including crossings, surface drainage, deep drainage and slope offset drainage (DHP);
- vi. Basic earthmoving projects, including service notes and reinforcement of base layers;
- vii. Basic Projects of special works of art (railway bridges);
- viii. Basic ballast projects;
- ix. Basic design of duct bank;
- x. Basic projects for the relocation of interferences;
- xi. Basic geometric projects of permanent track (horizontal and vertical geometry);
- xii. Basic projects for leasing and assembling LCD;
- xiii. Complementary basic road system projects (where applicable), including: earthworks; geometry; urban drainage; Paving; road signage (horizontal and vertical); streetlight; landscaping; and urbanization;
- xiv. Construction methods (preliminary study of the implementation phases of the modernization works).

5.2.2. Below are the details of the minimum contents for the development of the basic

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

projects:

- 5.2.2.1. **Implementation Plans:** This plan aims to understand the project as a whole, also containing, in addition to the design and route layouts and the OVERHEAD TRACTION NETWORK itself, the necessary information of complementary projects such as streets, earth movements, road system, urban insertion, pedestrian circulation and others. The plan must include the dimensions of the land and level elevations, in addition to the main dimensions as well as all the construction elements, properly located by coordinate axes.
- 5.2.2.2. **Longitudinal and Transverse Sections:** The sections have as their objective, in addition to the representation of the unevenness and internal views, the indication of the main structural dimensions, as well as: recesses; channels for the installation of systems (electrical, energy, signaling and telecommunications, rainwater collectors and conductors and others.); OVERHEAD TRACTION NETWORK GANTRIES; station platforms; structures of works of art such as viaducts, tunnels and bridges; structures for the passage of third-party pipes (water and sewage, energy, gas, telephony and others.) and other pertinent templates.
- 5.2.2.3. **Indication of relocation of INTERFERENCES:** Consists of the preparation of the INTERFERENCE registration drawings with the indication of all utility networks, public and private, to be relocated. The CONCESSIONAIRE shall prepare a project for the relocation of INTERFERENCES to the locations so as not to interfere with the buildings, railroad and road system. It must also indicate the relocation of pipelines, interceptors, water mains, sidewalks, poles and any installations that interfere with the execution or future implementation of the work. Projects of the INTERFERENCES found must be presented, indicating their new positioning.
- 5.2.2.4. **PERMANENT TRACK - VPM 001 to VPM 031 VENTURES:** Covers implementation and relocation studies, considering the infrastructure and superstructure of the road, with plans, profiles, slopes, unevenness and sections of the running track and the region of each turnout. The drawings must be presented with sufficient detail to allow the correct implementation of the roads, whether they are main or secondary roads. The geometric layout of the road should cover the entire contracted section, where the notable points of the road should be launched within the coordinate system. They should be composed of plans, longitudinal profiles, calculation memorials and coordinate tables and others.
- 5.2.2.5. **Each notable point should be characterized by:**

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- i. Corresponding number or name;
 - ii. UTM coordinates, in the CPTM reference system (SIRGAS 2000 – 23 South);
 - iii. Mileage;
 - iv. Distance between notable points and topographic landmarks; and
 - v. Quota at the top of the rail ticket.
- 5.2.2.5.1. In the development of the project, all the restrictions imposed and contained in document AD2141-0 "Template of Obstacles for the Construction of Fixed Installations", available in APPENDIX 1 of this EXHIBIT, must be fully respected.
- 5.2.2.5.2. Surveys of the complementary and necessary information on the location and positioning of obstacles, interferences and others that are not included in the register provided by the GRANTING AUTHORITY, or even in the topographic survey carried out, which, even if listed or surveyed, are not adequate and/or sufficiently precise for the testing of the solutions for the development of the geometric project.
- 5.2.2.5.3. Within the appropriate scale, horizontal and vertical plans must be prepared with launches of the new geometric traces on the cadastral planialtimetric topographic survey. In the geometry plan, the "base line" (reference line for the definition of superelevation data) must be defined, whose axis will be considered in the longitudinal profile of the tracks, with the identification of the points of vertical agreement and slope of the ramps (i%), where applicable.
- 5.2.2.5.4. The cross-sections will be consolidated based on the cadastral planialtimetric topographic survey and the geometric design (horizontal and vertical) of the roads.
- 5.2.2.5.4.1. On these sections, the existing installations must be launched with the indication of any changes resulting from the modernization works of the permanent track system.

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

5.2.2.5.4.2. In the breakdown of the sections, the following elements should be highlighted:

- i. The definitions of the drainage works;
- ii. Construction works in areas of slopes, hillsides, cuts, embankments, and others ;
- iii. Presence and relocation of pipes and various ducts;
- iv. Range necessary for definition of drainage, slopes and INTERFERENCES;
- v. Adjustments to the free passage and obstacle templates; and
- vi. The section of the track superstructure, with its components (sleepers, rails and ballast).

5.2.2.5.5. The guidelines contained in the Technical Specification CPTM AK7803-1 - "Geometric Design in the Lines", available in APPENDIX 1 of this EXHIBIT, must be observed.

5.2.2.5.6. A strategic implementation plan must be prepared, with a description of the methodology to be adopted, considering the circulation of trains on two tracks in all stages of the works. This methodology should be prepared by stages of implementation, covering deadlines, materials, equipment and labor, including the possible need for subcontracting services.

5.2.2.5.7. The materials, components and assemblies of the superstructure of the PERMANENT TRACK shall be quantified and identified in the quantity spreadsheets to be prepared by the CONCESSIONAIRE.

5.3. EXECUTIVE PROJECT

5.3.1. It must comply with the guidelines of the Technical Instructions, mentioned in this EXHIBIT, in its APPENDIX 1 and similar guidelines, if applicable, provided that they are duly justified, with the CERTIFICATION of the IMPLEMENTATION CERTIFIER and the non-objection of ARTESP.

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

5.3.2. It covers the detailing of the solutions defined in the BASIC PROJECTS, with plans, profiles and sections of the running road and in the region of each turnout. The drawings must be presented with sufficient detail to allow the correct implementation of the roads, whether they are main or secondary roads, observing the solutions related to interferences and their removals when appropriate. The development of the PERMANENT TRACK EXECUTIVE PROJECTS involves the following disciplines related to:

- i. Slope containment and protection;
- ii. Drainage, including crossings, surface drainage, deep drainage and slope offset drainage (DHP);
- iii. Earthworks, including service notes and reinforcement of the base layers;
- iv. Special works of art (railway bridges);
- v. Para-ballast;
- vi. Duct bank;
- vii. Relocation of interferences;
- viii. Geometric of permanent track (horizontal and vertical geometry);
- ix. Rental and assembly of LCD;
- x. Road system complements (where applicable), including: earthworks; geometry; urban drainage; Paving; road signage (horizontal and vertical); streetlight; landscaping; and urbanization; and
- xi. Construction method (detailing of the implementation phases of the modernization works).

5.3.3. The preparation of the EXECUTIVE PROJECT must follow the other guidelines indicated in EXHIBIT II.A.

5.4. Conditions for the Work Start

5.4.1. The basic criterion of the methodology established herein is to obtain the construction of the infrastructure and superstructure of the PERMANENT TRACK, within the specified characteristics and tolerances, with uniform and homogeneous finishes.

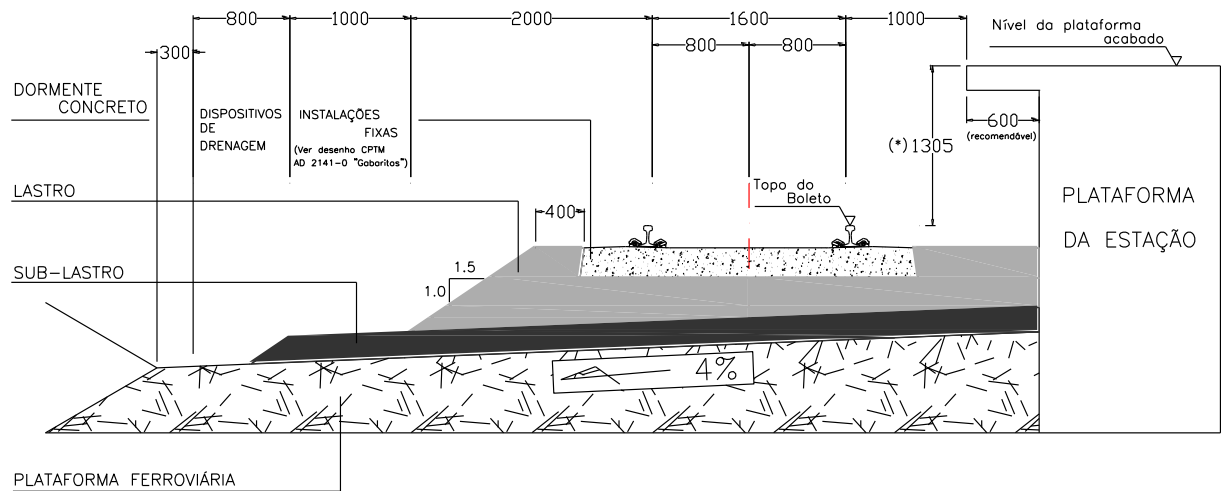
SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- 5.4.2. The superstructure of the PERMANENT TRACK shall consist of a prestressed concrete monoblock sleeper, on the main roads, with continuously welded rails and elastic fastenings, resting on layers of subballast and crushed stone ballast. The infrastructure and superstructure must be designed according to the railway vehicles (train type and cargo), the annual loading, the speed, the characteristics of the railway platform (soil material), including the preparation of documents in accordance with the NS procedure. GFA /001 version 04 "Issuance of Technical Documents".
- 5.4.3. The field services (topographic survey and subsoil prospecting) necessary to subsidize the development of the projects cannot harm the circulation of trains.
- 5.4.4. Metropolitan trains circulate on the LINES for the transport of passengers and cargo, making transpositions with previously established routes. Under normal operating conditions, the lanes are unidirectional and left-handed, eventually, in case of emergency, this condition may be temporarily modified.
- 5.4.5. The freight trains operated by MRS must share the use of the tracks of LINE 11-Coral between Barra Funda and Luz, between Luz and Brás, between Brás and SE Engenheiro Gualberto, observing the conditions of the MRS/CPTM AGREEMENT, contained in EXHIBIT XI and also between Suzano and Estudantes. The same should happen on LINE 12, stretch between Brás and Engenheiro Manoel Feio. The same sharing, and coexistence regime with MRS, must be observed during the execution of the modernization works of LINES 11-Coral and 12-Safira, sections identified in Table 1. These conditions are in accordance with EXHIBIT III.C.

5.5. Earthworks

- 5.5.1. The finishing dimension ("greide") must meet the dimensions of the superstructure of the PERMANENT TRACK and in the region of the Stations, the gauge in relation to the platforms must meet the dimensions indicated in figure 3, being: distance of the grid (distance between the axis of the projected track) in relation to the edge of the platform of 1800mm; and the elevation of the top of the billet in relation to the finished floor of the 1305mm platform. The final layer of the earthwork must comply with the sections type AQ6407-0 and AQ6408-9, contained in APPENDIX 1 of this EXHIBIT.

Figure 1: Type conformation of the Infrastructure and superstructure on platform



(*) value to be verified, observing the guidelines of the PERMANENT TRACK template design of the technical instructions AD 2141-0 - "Permanent track Obstacle Template for the Construction of Fixed Installations", and AI 0347-4 - "Obstacle Template for the Construction of Fixed Installations - Line A, B, C, D, E and F".

- 5.5.2. In the design of earthworks and containments (when necessary), stability conditions for the slopes of the cuts and embankments must be ensured.
- 5.5.3. The containment works projects will be developed based on thrust diagrams consistent with geological and geotechnical conditions and according to the type of solution adopted. The containment works may be: gravity, bending or cable-stayed works, choosing the one that presents the best technical characteristics for each location.
- 5.5.4. In the determination of the thrust diagrams, the classical methods will be used, taking into account the physical and mechanical characteristics of the earthy or rocky materials, according to the profile of the subsoil present. The effects resulting from the executive method to be employed must also be considered.
- 5.5.5. The projects must be prepared based on topographic surveys, geological-geotechnical studies and hydrological studies, technical services under the responsibility of the CONCESSIONAIRE. They must present all the elements necessary for the reconstitution of the characteristics of the earthmoving platform and the implementation of the planned containment works.
- 5.5.6. In earthmoving works, vegetation protection must be provided for in the lateral areas between the closing wall and the superstructure of the PERMANENT TRACK or surface drainage, which must have the following performances:

a) On earthmoving slopes:

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- Plant protection and/or alternatives depending on the need found;
- The solutions developed must be easy to maintain with the use of mechanized equipment;
- The defined solutions must guarantee the drainage of rainwater, without compromising the surface of the slope and the drainage systems;
- The current vegetation must be treated in such a way that only the specified grasses remain or are established, in guarantees of the surface protection of the slope;
- The quality of the soil on the surface of each slope must be evaluated, to qualify the planting of the specified grass.

5.5.7. The permanence of the vegetal soil and the specified grass must be guaranteed on any slope, resulting from studies and projects and for this it must have specific solutions.

On other surfaces within the domain range and externally the superstructure and drainage range:

- Between the closing wall and the drainage channel, when the distance is less than the width of the mechanized vegetation clearing equipment, this surface must be concreted;
- The surface must be formed as a lateral earthwork that enables its mechanized maintenance, at a controllable level of vegetation. To do this, the surface must be flat, regular or inclined without indentations or protrusions;
- The cables and ducts located in this area must be protected and buried, in such a way that the mechanized maintenance services do not damage them;
- The current vegetation must be treated in such a way that only the specified grasses remain or are established, in guarantees of surface protection;
- The quality of the soil on the surface should be evaluated to qualify the planting of the specified grass.

5.5.8. For the scope of activities of each project, it will be necessary to present the technical documents minimally listed below. Such documents must obtain CERTIFICATION by

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

the IMPLEMENTATION CERTIFIER and non-objection by ARTESP:

- DT: Technical Drawing of the site in question, with the representations of the cross-sections, identifying the level of the existing and proposed terrain, observing the requirements and best techniques;
- ET: Technical Specification in the definitions of geometry correction and civil works, defining from the layers of soil or compatible material, in the constitution of the railway platform (grid) to the top of the billet, as well as the structure of the station platform and other particularities that may be necessary;
- MC: Calculation Memory of the railway platform (grid);
- ME: Executive Method to be employed in the development of these activities (embankment), including operational interference in the circulation of trains and other systems involved.

5.6. Drainage

- 5.6.1. The drainage system of the PERMANENT TRACK in the region with altered geometry in the Stations must be adapted to any changes in the local topography or even to the probable interference of the new civil installations.
- 5.6.2. In the necessary relocations of the current system and in the development of new devices, best practices must be observed.
- 5.6.3. The discharge of rainwater and wastewater next to the PERMANENT TRACK from the fixed installations of the drainage systems of the roofs and other dependencies of the Stations are prohibited.
- 5.6.4. The projects of current and drainage works must be prepared from the hydrological studies, which consist of the detailing of the set of devices aimed at conducting rainwater captured on the railway platform, necessary to protect the infrastructure and superstructure of the PERMANENT TRACK, basically comprising:
 - General design of the system;
 - Verification of the state of conservation and hydraulic behavior of existing drainage devices and culverts;
 - Project involving the dimensioning and detailing of the new solutions and adjustments that are necessary for the execution of the planned works.

5.7. Pipe crossings

5.7.1. In the PERMANENT TRACK project, all existing and planned electrical, electronic, hydraulic and other cable crossings in the Civil and Systems projects must be mapped.

5.7.2. The locations foreseen for such crossings are in the regions of the ends of railway station platforms, at the crossings (LCD), at the impedances or glued insulating joints installed on the track and others, observing:

- The quantification and exact location of the crossings must be in compatibility, during the development of the project, with the other signaling, electrical, electronic and other systems;
- Crossings must be executed perpendicular to the axis of the tracks and located under the subballast;
- The cables that cross one rail to another on the same track, especially in the regions between glued insulating joints and impedance bonds, these must be fixed on the rails themselves and on the upper surface of the sleeper, so that they do not impair the mechanized maintenance services of the PERMANENT TRACK. When there are other situations of passage, the cables must be led in pipes and located under the subballast or on the railway platform;
- The section and curvature of the tubes should be dimensioned according to the need. Structurally, the pipes must be compatible with the forces coming from the superstructure of the PERMANENT TRACK, ensuring the integrity of the pipes and cables, as well as the upper and lower layers of the track;
- The crossings cannot compromise drainage;
- The electrical cables and hydraulic installations will be introduced after the construction of the superstructure of each section, and for this, the design of the project must enable this service;
- Drivers must be protected during the execution of the PERMANENT TRACK, to avoid entry and/or clogging of waste stone, concrete, water, or any other material;
- The implementation of crossings of any nature and purpose after the end of the infrastructure will be expressly prohibited, thus avoiding the rupture and destabilization of the infrastructure and the contamination of the ballast;

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- Other interferences, such as underpasses (pedestrian underpasses), bridges, bridges, culverts, private or third-party crossings under the strip, may not impair the continuity of the superstructure as a whole, and all its geometric, stability, elastic properties and other characteristics must be maintained;
- The positioning of the crossings should be defined through the mileage of the road and the local topographic coordinates.

5.7.3. For the scope of activities of each project, it will be up to the presentation of the technical documents minimally listed in item 5.5.8. Such documents must obtain CERTIFICATION by the IMPLEMENTATION CERTIFIER and non-objection by ARTESP.

5.8. Superstructure

5.8.1. The design of the PERMANENT TRACK superstructure will be based on the definitions of the infrastructure projects and their dimensioning according to the specified data and assumptions. The project must cover the materials, components, assemblies and equipment belonging to the superstructure of PERMANENT TRACK in the various phases:

- Assembly and its homologation;
- Monitoring and quality control during assembly;
- Acceptance of the execution of the work.

5.8.2. Subballast (an item that is part of the railway infrastructure) - When the condition and/or quality of the embankment so requires, or always on new embankment, subballast must be used on the final layer of earthworks, obeying the granulometric composition specified by NBR 5564 of ABNT and Technical Specification AI1914-1.

5.8.3. Ballast

5.8.3.1. The track, yards, parking lots and LCD must be laid on prestressed monoblock concrete sleepers, and these must be seated on crushed stone ballast in recovered or new sections on the subballast. In new stretches, the introduction of subballast is mandatory.

5.8.3.2. The existing ballast must be evaluated for its quality and reuse. Materials should be removed in typical regions, considered normal, little degraded, flooded, pumped and contaminated.

5.8.3.3. After the evaluation, the entire road to be relocated or built must be

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

mapped, defining the sections and destinations of the ballast on the roads separately.

5.8.3.4. The destination of the ballast must be classified as:

- Reusable without restriction;
- Reusable, but needs rework (example: sieving and washing);
- Not reusable as ballast or sub-ballast.

5.8.3.5. The various proposed recoveries must be accompanied by a technical/economic analysis.

To perform the analysis, samples shall be taken at each analysis point in the following two ways:

- Strictly under the sleepers and;
- Mixed under the sleepers, between sleepers and shoulders.

5.8.3.6. To conclude that the ballast is "reusable without restriction" the sample has to be only "strictly under the sleepers".

5.8.3.7. When the ballast is classified as "non-reusable", its reuse in infrastructure works must be studied, without dispensing with the aspect of environmental contamination.

5.8.3.7.1. The new ballast must be with the granulometry and other physical characteristics indicated in Technical Specification AA-1097-0 and in the assembly of the track, the layer must have the following dimensions: the ballast shoulder (excess measure from the end of the sleeper to the ballast) must be compacted and have a width of at least 0.30 m in a straight line, and 0.40 m in a curve; and under the sleeper must be at least 0.30 m, in the region of the support of the lowest rail. In the intervals, 0.20 m of ballast thickness must be provided over the sub-ballast, but without compaction. Any application that involves a solution other than the indicated Technical Specification must be submitted to CERTIFICATION.

5.8.4. Track assembly

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- 5.8.4.1. After the compaction of the ballast, the assembly activities of the PERMANENT TRACK will begin, with the distribution of the superstructure materials, so that they do not impede the normal development of subsequent services and do not pose risks to the circulation of trains on adjacent tracks.
- 5.8.4.2. Using the location given by the topographic landmarks for the installation and assembly of the tracks, the sleepers must be distributed, in the approximate geometric position of the PERMANENT TRACK, obeying the alignments and distances defined in the project, and in the curves the sleepers must be distributed in the radial position and the spacing measured in the axis of the external rail.
- 5.8.4.3. The rail will be fixed to the sleeper with the installation of elastic fastening, composed of elastic clamp, insole and insulator. The application of the staple must be with an appropriate tool, and the use of sledgehammers is not allowed. At this stage, fastenings can be applied under any rail temperature, simply to allow track ballasting. However, it should be preferred to apply the fixation at neutral temperature to avoid subsequent services of its removal and placement.
- 5.8.4.4. In the final completion of the ballast, in the phase immediately prior to the leveling and alignment of the track, appropriate equipment must be used for the movement of crushed stone.
- 5.8.4.5. The conditions of access and the difficulties inherent to the construction of the tracks located between the platforms of the stations must be analyzed, promoting the necessary adjustments to the method for assembling the track.
- 5.8.4.6. For the leveling and alignment of the tracks, automatic heavy equipment must be used, with programming and quality control of the graphic services on board.
- 5.8.4.7. The road must be tamped, leveled and aligned, until the geometric position specified in the project is obtained. Tamping should continue until a stable ballast is obtained under the sleeper, even when the pressure of tamping tools is applied.
- 5.8.4.8. The ballast material must be sufficient so that, after tamping, leveling and alignment, cross-sections are obtained according to those defined in the project.

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- 5.8.4.9. The upper face of the sleepers must be free of ballast material.
- 5.8.4.10. Rollers must be used in the work of relieving the stresses of the rails in order to minimize friction and allow the free movement of the rail. The neutral rail stresses and the closing weld should have their reference to the average temperature of the region. The stress of the closing welds must be relieved due to the retraction of the weld. The installation of a long rail continuously welded must be carried out, observing that the CONCESSIONAIRE must calculate the so-called "neutral temperature" considering its deviations applicable to the climate where they will be implemented, using this data both for the assembly of new roads and for the maintenance of PERMANENT TRACK, its aspects of settlements and welding.
- 5.8.4.11. Where an insulating joint is provided, it shall be executed in a place predetermined by the CONCESSIONAIRE. Insulating joints must comply with the manufacturer's specifications and warranty requirements, and be installed before final welds of the rails.
- 5.8.4.12. Materials such as: concrete sleepers, fixings, insoles, insulators and the rail must meet the drawings and specifications for rails of the UIC 60 standard, or another existing in the Line, depending on the stretch and modernization recommendations.
- 5.8.4.13. All materials applied must be tracked, and a mapping of the batches of materials and components applied on the roads must be made, for later identification in case of problems.
- 5.8.4.14. All components and materials of the PERMANENT TRACK, during and after its installation, must be protected against waste from the work.
- 5.8.4.15. To verify the geometry of the track, the rail, support plate, insole, or any layer of the superstructure of the PERMANENT TRACK must have full support.
- 5.8.4.16. According to the project, the rail skates must be positioned at their possible external limits and be perfectly seated on their supports, laterally without sconsity (misalignments) of the support plates in relation to the rail.
- 5.8.4.17. Upon completion of the services, all debris should be removed from the track and the ballast section recomposed where necessary.
- 5.8.4.18. Before being made available for OPERATION, the road must be traveled by control car or equivalent equipment to check/measure the project parameters and to support the preparation of the MAINTENANCE PLAN, a

condition to be provided by the GRANTING AUTHORITY with the support of CPTM.

5.9. Geometric tolerances allowed in the execution of the PERMANENT TRACK

- 5.9.1. To verify the geometry of the track, the rail, support plate, insole, slab and/or any layer of the superstructure, the PERMANENT TRACK must have full support according to the project and the rail skids must be positioned at their possible external limits and be perfectly seated on their supports, laterally without hiding the support plates in relation to the rail.
- 5.9.2. In the event that the settlement control is carried out using a graph, through a recording device, the tolerances must be transformed according to the base of this device.

5.10. Vibration, primary and secondary noise

- 5.10.1. In the case of implementation of a stretch of new road, the BASIC PROJECT and the EXECUTIVE PROJECT must be developed in such a way as to guarantee the noise and vibration limits established in federal, state and municipal law, in the following situations:
 - Vibrations and secondary noises caused by rolling stock and maintenance transmitted by solid track in buildings adjacent to the track and in the technical rooms of the stations;
 - Primary noises resulting from wheel/rail contact, transmitted by air, in buildings bordering the side of the tracks and in stations.
- 5.10.2. For the execution of the infrastructure project, superstructure and side protections of the road, a survey of the adjacent buildings must be carried out, mapping and framing the legal limits.
- 5.10.3. Depending on the surveys and the design parameters, the type of infrastructure and superstructure, the natural frequency of the system required, as well as the mechanical impedance range and the necessary limits for the damping coefficient in relation to the critical level must be defined in each section. The process for the acoustic barrier, noise and vibration damping should be similar.
- 5.10.4. The maximum allowed limits for noise and vibrations must aim at primary and secondary noise according to ABNT NBR 10152 standard, and for vibration according to DIN 4150 part 2.

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- 5.10.5. Special attention should be paid to the characteristic noise that occurs in the curves with closed radii and in the new sections of the track.
- 5.10.6. To dampen primary noise, an acoustic barrier should be used. The section, side of the road, height, position in relation to the road, material and damping of the acoustic barrier must be defined. A Preliminary Environmental Impact Study must be carried out, carried out in accordance with EXHIBIT IV.
- 5.10.7. To dampen secondary noise, a spring mass or equivalent solution should be used.

5.11. Bumper

- 5.11.1. Bumpers must be used at the ends of the main roads, on secondary roads and on yard roads.

The performance of the bumpers must ensure the damping of the impact of the train composition, without prejudice to the integrity of both the bumper and the train, within the established limit of energy absorption capacity, observing the relevant technical standards in order to ensure safety.

- 5.11.2. The bumper must meet the following requests and conditions:
 - i. On the main track: Mass of the passenger train full at a speed of 25 km/h at the moment of impact;
 - ii. On secondary roads, parking lots and yards: Impact mass with empty passenger train at a speed of 15 km/h at the moment of impact;

5.12. Station Platform

- 5.12.1. The edge of the platform should be executed in a monolithic manner with the structure of the platform.
- 5.12.2. Its correct position must be guaranteed in order to meet the dynamic gauge of free passage of cars and the safe boarding and disembarking of passengers. In the case of a new station platform, its execution must meet the ABNT accessibility standard.
 - The nominal height of the platform in relation to the rail billet is 1,305 mm;
 - The nominal distance from the edge of the platform to the center of the track is a maximum of 1,800 mm.
- 5.12.3. The maximum allowable tolerances are:

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- 10 mm in relation to the projected horizontal distance;
- 10 mm relative to the projected vertical distance.

5.12.4. Maximum variation of horizontal and vertical tolerances: 10 mm in 10 m.

5.13. Acceptance of the PERMANENT TRACK Superstructure

5.13.1. For the acceptance of the superstructure of the PERMANENT TRACK, measurements and instrumentation must be carried out in all sections of the roads, according to specific procedures, to prove that the installed system corresponds to the projected. Measurements and instrumentation may be requested by the IMPLEMENTATION CERTIFIER.

5.13.2. At least the following items must be proven in the various phases:

- Topographic landmarks and geometry of the installed road;
- Installation of systems, assemblies, components and equipment;
- Welding;
- Electrical insulation;
- Efficiency of the drainage system of the leakage of electric current;
- Dynamic free passage template;
- Operation of the Track Switch with key machines, stop and locking detectors, including the maximum actuation forces of the points and frogs;
- Stability of the PERMANENT TRACK system, assembly and superstructure components. The various performances must be proven according to the respective previous items;
- Damping and remanence of noise and vibrations. The various performances must be tested in accordance with the specified technical requirements, with all speed codes.

5.13.3. For acceptance of the PERMANENT TRACK superstructure, it must be completed and clean.

6 SPECIFIC GUIDELINES FOR THE DESIGN AND CONSTRUCTION OF THE OVERHEAD TRACTION NETWORK (CATENARY)

6.1. The development of the executive project of the OVERHEAD TRACTION NETWORK involves the following disciplines:

- i. Executive project for the foundation of the poles;
- ii. Detailing of poles and support gantries of the OVERHEAD TRACTION NETWORK;
- iii. Detailing of anchors;
- iv. Calculation memory;
- v. Electrical single-line diagram;
- vi. Construction method (detailing of the implementation phases of the modernization works).

6.1.1. The preparation of the EXECUTIVE PROJECT must follow the other guidelines indicated in EXHIBIT II.A.

6.2. Construction

6.2.1. The guidelines defined herein are mandatory for the construction of the OVERHEAD TRACTION NETWORK (Catenary), and the CONCESSIONAIRE may define its own project, respecting the guidelines.

6.2.2. The overhead networks must be installed to supply the trains and the self-compensated OVERHEAD TRACTION NETWORK must be provided along the entire length of the main tracks, including the sections that undergo adaptation of the PERMANENT TRACK and the line extensions.

6.2.3. It will consist of a messenger cable and two contact wires, all in copper, with gauges of 253 mm² and 107 mm², respectively.

6.2.4. The main components of overhead networks are the conductors of the messenger cable, contact wire and equipotential cable. As for suspension and fixing, articulated and insulated triangles or cantilevers will be used, as well as the usual suspenders and handles.

6.2.5. For grounding meshes, the NBR 15751, NBR 15749 and IEC 62305 standards must also be observed.

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- 6.2.6. In addition, self-compensating devices consisting of the hoist and pulley set must be used. For the installation of the OVERHEAD TRACTION NETWORK, the poles can be made of concrete or metal and, depending on the number of tracks, metal structure gantries can be used.
- 6.2.7. In fixed OVERHEAD TRACTION NETWORK systems, tensioning is designed for a temperature of 20°C, while in self-compensating systems the tensioning is constant, regardless of the ambient temperature. This fixed system has low performance and should be avoided in the overhead networks of the main roads, and can be used, exceptionally, on secondary roads or parking lots.
- 6.2.8. The self-compensated system should be adopted for all sections of the main roads.
- 6.2.9. The OVERHEAD TRACTION NETWORK sections will be self-compensating and must consist of a maximum of 1600m, where in approximately 800m on each side of this section a fixed anchoring system will be inserted, called fixed point, ensuring the tensioning of the system according to the temperature variation.
- 6.2.10.** For the lightning rod system, preferably use polymeric insulators that have a level of repeatability and quality.

7. PHASING OF WORKS – GENERAL

- 7.1. Given the volume of works to be carried out, on different work fronts along LINES 11-Coral, 12-Safira and 13-Jade, the construction method must foresee phases of interventions, in such a way that the execution of the services brings the least possible impact on the circulation of PASSENGER and freight trains.
- 7.2. In order to recover the system, the infrastructure and superstructure of PERMANENT TRACK of LINES 11-Coral and 12-Safira must undergo a comprehensive modernization plan, involving the various phases of a railway project, from the field survey/preliminary studies and preparation of projects, to the implementation of the works and final commissioning of the system.
- 7.3. The CONCESSIONAIRE, in the planning of the works, must take into account that they will be carried out at intervals at night and on weekends, and may maintain a single track for the circulation of trains during the off-peak hours of the COMMERCIAL OPERATION of the LINES. The schedule of services that will be performed during the "valley" hours will be communicated to the GRANTING AUTHORITY.
- 7.4. In exceptional cases that will require the stoppage of the circulation of trains on the LINE, the CONCESSIONAIRE must prepare a detailed plan informing the activities and interdiction period, ensuring supply through the PAESE agreement, under the terms of EXHIBIT III.C, to meet the demand in the interrupted segment, submitting it to the analysis and authorization of ARTESP,

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

at least, 30 days before the start date of the work.

- 7.5. Together, LINES 11 and 12 reach a total of 89.57 kilometers in length, in double track, which requires special care from the CONCESSIONAIRE, both in the modernization phase and in the preventive maintenance of the system.
- 7.6. The modernization plan was structured by sections called VPM, considering the current conditions of conservation and loading in each segment of the LINES in question. Before, however, within the estimated period of up to 3 (three) years of the CONCESSION, the system must undergo recovery of the infrastructure and superstructure of the PERMANENT TRACK (LINE 11 - Brás / Estudantes section and Line 12 - Brás / Calmon Viana), VENTURES called VPM001.
- 7.7. It is important to highlight that both in the recovery of the road and in the modernization, a large part of the superstructure materials will be replaced and must be collected in yards intended for the storage of heavy materials of PERMANENT TRACK. Among these materials, sleepers, rails, LCD and metal accessories deserve to be highlighted, and as a recommendation, the CONCESSIONAIRE may adopt the following procedure: select the materials, separating by type and classification as serviceable and unserviceable; the serviceable materials must remain in stock for future use by the CONCESSIONAIRE itself; and unusable materials must be grouped by category and placed for disposal, and it is also necessary to observe the proper transport and storage of any contaminated waste.
- 7.8. For all VENTURES, the CONCESSIONAIRE must prepare an EXECUTION PROGRAM detailing each stage of the services, in order to minimize the impacts on the OPERATION of the LINES.

PART II – PERMANENT TRACK AND OVERHEAD TRACTION NETWORK VENTURES

The following are the PERMANENT TRACK AND OVERHEAD TRACTION NETWORK projects, with emphasis on the sections, scope and any complementary notes.

For each of the VENTURES, it is reiterated that the BASIC and EXECUTIVE PROJECTS must be prepared.

For all the VENTURES in this EXHIBIT that contemplate recovery and modernization, the following must be presented: technical documentation, specifications, drawings, illustrations that characterize the VENTURE, including BASIC PROJECT and EXECUTION PROJECT, the latter when applicable, in case of changes in the technologies of replaced equipment, as applicable.

For VENTURES that contemplate expansion, the items referring to the BASIC PROJECT and the EXECUTIVE PROJECT apply, at least.

Once the VENTURES are completed, the CONCESSIONAIRE must maintain the system as a whole, including the infrastructure and superstructure services, including the replacement of components that suffer wear and tear, with emphasis on the fastening system, rails and LCD'S.

Concomitant with the road works, periodic infrastructure maintenance services must be carried out, with emphasis on the following items: weeding; Mowing; cleaning of culverts (crossings), channels and channels that make up the railway drainage system; loading, transporting and unloading debris in a licensed boot.

1 VPM 001 VENTURE - RECOVERY OF THE PERMANENT TRACK OF LINES 11 AND 12, BRÁS / ESTUDANTES AND BRÁS / CALMON VIANA SECTIONS, RESPECTIVELY

The recovery of the system applies to LINES 11-Coral and 12-Safira and aims to eliminate all fault points related to maintenance and/or deficiency (wear limit or end of useful life) of the materials, including the infrastructure and superstructure of the tracks.

Based on the field survey carried out in the diagnosis phase of the existing conditions, such services should be carried out in the second and third year of the CONCESSION, in the stretches between the Brás and Estudantes stations – LINE 11-Coral and between the Brás and Calmon Viana stations – LINE 12-Safira, totaling the length of 89.57 km (double track).

Basically, the VENTURE involves recovery with the following activities:

- Partial or total change of ballast, depending on the tests carried out with samples collected at the points where there is "pumping" of water, or evident signs of contamination/clogging of the ballast;
- Complementation of ballast where the grid is exposed;

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- Replacement of deteriorated wooden sleepers with wooden sleepers (track sleepers and LCD, which are at the end of their useful life);
- Adjustments in the rail fixing set, in the segments where the gauge is open, above the maintenance tolerances ($b > 1622\text{mm}$);
- Replacement of rails at points where this component shows wear above the limit of 25% of the billet area;
- Replacement of components (points and/or frogs) or set of LCD with wear above the maintenance tolerances specified in the AREMA or UIC manuals, and between Artur Alvim and Guaianases the LCD are of the UIC standard, and along LINE 11 – Coral the key machines were replaced by the MD2000 model; and
- Tamping, leveling and mechanized alignment of roads and LCD.

NOTE:

Concomitant with the road recovery works, periodic infrastructure maintenance services must be carried out, with emphasis on the following items: weeding; mowing; cleaning of culverts (crossings), ducts and channels that make up the railway drainage system; loading, transporting and unloading debris in licensed dumping.

The planning of these activities and establishment of priorities is the sole responsibility of the CONCESSIONAIRE, and all works must be concatenated with the modernization of each of the sections of Lines 11 – Coral and 12 – Safira, in order to avoid overlapping services and/or early replacement of track superstructure materials. All these actions must be communicated at least 30 days in advance to ARTESP and in the event of the existence of critical points that may affect the circulation of the trains, the CONCESSIONAIRE must inform: the location; type and cause of the anomaly; date of start and end of the execution of the work and other measures for the recovery of the system.

2 VPM 002 AND RDA 001 VENTURE - LUZ TO BRÁS STRETCH

In this section, the modernization services of the PERMANENT TRACK system, routes 3 and 4 will be carried out and the replacement of the fixed OVERHEAD TRACTION NETWORK with self-compensated will be carried out. As in the VPM 002 VENTURE, it is an extremely loaded segment of track (heavy train traffic), which requires the CONCESSIONAIRE to have adequate planning so as not to affect the passenger transport SERVICES (LINES 11-Coral and 13-Jade) and cargo that use these tracks, observing the MRS / CPTM AGREEMENT, contained in EXHIBIT XI.

It should be noted that this stretch of line also runs on Line 10-Turquoise trains (tracks 1 and 2), whose SERVICE should not be affected by the modernization works of tracks 3 and 4, exclusive to LINES 11-Coral and 13-Jade.

Scope of modernization of this section:

- Replacement of the fixed aerial network for the self-compensating aerial network;
- Implementation of deep drains and surface drainage channels;
- Replacement of all wooden sleepers with monoblock concrete sleepers;
- Replacement of TR 57 rail by UIC 60 (routes 3 and 4), in the total length of this section;
- Replacement of all LCD's/Crossbeams
- Total ballast change; and
- Tamping, leveling and mechanized alignment of running track and LCD.

As mentioned, this stretch is extremely loaded and because of this, when planning interventions on the superstructure of the road, you must follow the steps presented below:

- a) Replacement of TR 57 rails with UIC 60. To this end, a fastening set (support plates and elastic clamps) must be provided in sufficient quantity for at least 1 km of road. This fixation is temporary, and is part of the construction method. Provisionally, the drilling of wooden sleepers must be "billeted";
- b) Replacement of wooden sleepers with monoblock concrete sleepers;
- c) Cleaning of the ballast to the underside of the sleepers. This cleaning must be in segments and interspersed, always associated with the discharge of new ballast (first discharge), in order to avoid problems with the stability of the track;
- d) Replacement of the LCD located on the service fronts, as the works progress on the track. The replacement of LCD includes the replacement of the respective sleeper sets;
- e) Location and leveling of the road, following the project quotas;
- f) Complementary discharge and regularization of the ballast;
- g) Mechanized lifting of the grid in successive steps up to the design level - minimum lift of 25 cm in relation to the current level;
- h) Tamping, leveling and final alignment of the grid following the project dimensions.

NOTE:

If the CONCESSIONAIRE adopts a different construction method, the new methodology must be submitted to analysis for CERTIFICATION, subsidizing the non-objection of ARTESP, accompanied by the technical justification and indication of the advantage of the proposed change, at least 30 days before the start of the work.

3 VPM 003 AND RDA 002 VENTURE - BRÁS TO SE ENGENHEIRO GUALBERTO STRETCH

In this section, the modernization services of the PERMANENT TRACK system of roads 1 and 3 will be carried out, as well as the replacement of the fixed OVERHEAD TRACTION NETWORK with self-compensated ones. It should be noted that in this stretch are located Pátio Novo do Brás and the Engenheiro São Paulo Complex, which requires the CONCESSIONAIRE to pay special attention to minimize or avoid the impacts of access to such places by the ROLLING STOCK. It should also be noted that in this same stretch, the operational lane is shared with tracks 2 and 4, where the trains of LINES 12-Safira and 13-Jade circulate, in addition to the AIRPORT EXPRESS SERVICE, and freight trains, whose SERVICES should not be affected by the modernization works of tracks 1 and 3.

Scope of modernization of this section:

- Replacement of the fixed aerial network for the self-compensating aerial network;
- Implementation of a ballast, where the unevenness between the surface of the sleeper and the offset of the ballast is greater than 65 cm;
- Demolition of the platforms of the old Engenheiro Sebastião Gualberto station;
- Implementation of deep drains and surface drainage channels of the railway strip;
- Replacement of all wooden sleepers with monoblock concrete sleepers;
- Replacement of TR57 rails with UIC 60, full length of this section;
- Replacement of all LCD/dashes of this section, from the AREMA standard to the UIC;
- Tamping, leveling and mechanized alignment of running track and LCD.

As this section is extremely loaded in operational terms, the planning of interventions in the superstructure of the road must adopt the executive sequence presented below:

- a) Replacement of TR 57 rails with UIC 60, in addition to providing a fixing set (support plates and elastic clamps) in sufficient quantity for at least 1 km of track. This fixation is temporary, and is part of the construction method. Provisionally, the drilling of wooden sleepers must

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

be "billeted";

- b) Replacement of wooden sleepers with monoblock concrete sleepers;
- c) Cleaning of the ballast to the underside of the sleepers. This cleaning must be in segments and interspersed, always associated with the discharge of new ballast (first discharge), in order to avoid problems with the stability of the track;
- d) Replacement of the LCD located on the service fronts, as measured by the progress of the works on the running track. The replacement of LCD includes the replacement of the respective sleeper sets;
- e) Location and leveling of the road, following the project quotas;
- f) Complementary discharge and regularization of the ballast;
- g) Mechanized lifting of the grid in successive passes to the design level - minimum lift of 25 cm in relation to the current level.
- h) Tamping, leveling and final alignment of the grid following the project dimensions.

NOTE:

If the CONCESSIONAIRE adopts a different construction method, the new methodology must be submitted to analysis for CERTIFICATION, subsidizing the non-objection of ARTESP, accompanied by the technical justification and indication of the advantage of the proposed change, at least 30 days before the start of the work.

4 VENTURE VPM 004 AND RDA 003 - STRETCH FROM ENGENHEIRO GUALBERTO TO CORINTHIANS-ITAQUERA

In this project, the modernization services of the infrastructure and superstructure of tracks 1 and 2 where passenger trains of LINE 11-Coral circulate will be carried out, as well as the replacement of the fixed OVERHEAD TRACTION NETWORK with the self-compensated one. In terms of passenger demand, this stretch is very loaded and in the planning of activities and interventions on the roads, the CONCESSIONAIRE must take special care in order to minimize the impacts on the SERVICES provided on this LINE.

Scope of modernization of this section:

- Replacement of the fixed aerial network for the self-compensating aerial network;
- Demolition of the platforms of the old Artur Alvim station;

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- Execution of containment and sealing works of the lane;
- Replacement of the set of LCD on the stretch between SE Gualberto and the old Artur Alvim station;
- Replacement of TR 68 rail with rail of the same profile, in segments with wear limit of 25% of the billet area;
- Replacement of 100% of the existing LCD in this section to the UIC-60 standard with concrete sleepers;
- Implementation of para-ballast, where the unevenness between the surface of the sleeper and the *offset of* the ballast is greater than 65cm;
- Ballast recomposition; and
- Tamping, leveling and mechanized alignment of the running track and LCD.

NOTE:

The stretch between stakes 14+500 (former Artur Alvim station) and 18+000 (Corinthians-Itaquera station) has a self-compensating traction network. Therefore, in this section, only the work on the PERMANENT TRACK is required.

5 VPM 005 VENTURE - TUNNEL SECTION 3 TO GUAIANASES (km 23+040 to km 24+800)

In this VENTURE, the modernization services of the infrastructure and superstructure of tracks 1 and 2 where passenger trains of LINE 11-Coral circulate, will be carried out. Also in this segment of LINE are located the LCD's of access to the Guaianases Yard, which requires care by the CONCESSIONAIRE in order not to interrupt operations next to the train parking lot.

Scope of modernization of this section:

- Replacement of all existing wooden sleepers in this stretch with concrete monoblock sleepers (segment between 24+500 and 24+800);
- Replacement of TR 57 rails with UIC 60 rail;
- Replacement of 50% of the LCD;
- Total Log Truck;

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- Ballast recomposition; and
- Tamping, leveling and mechanized alignment of the running track and LCD.

NOTE:

It should be noted that the above-mentioned services are concentrated in the region of Guaianases Station, between the train parking yard and the border with the VPM 006 VENTURE.

6 VPM 006 AND RDA 004 VENTURE - GUAIANASES TO SUZANO STRETCH

In this section, the modernization services of the PERMANENT TRACK system, routes 1 and 2, and the replacement of the fixed OVERHEAD TRACTION NETWORK with the self-compensated one, will be carried out. It should be noted that in the stretch between the Calmon Viana and Suzano stations, tracks 1 and 2 of LINE 11-Coral will have their axes shifted laterally and with that part of the lane of Av. Brazil will be occupied by the railway system.

This displacement is intended to enable the extension of LINE 12-Safira to Suzano (detailed in VENTURE VPM 014) and as a result, in the planning of the specific modernization of VPM 007, the CONCESSIONAIRE must consider the implementation schedule of the works of the aforementioned LINE.

Scope of modernization of this section:

- Replacement of the fixed aerial network for the self-compensating aerial network;
- Demolition of the platforms of the old Guaianases station;
- Containment and sealing works of the lane;
- Drainage works;
- Implementation of para-ballast, where the unevenness between the surface of the sleeper and the offset of the ballast is greater than 65cm;
- Replacement of all existing wooden sleepers in this stretch with monoblock concrete sleepers;
- Replacement of TR68 rails with UIC 60, full length of the stretch;
- Replacement of 50% of the existing LCD's/Indents in this section by the UIC type;
- Total Log Truck;

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- Ballast complementation; and
- Tamping, leveling and mechanized alignment of running track and LCD.
- Urban readjustment with all the works agreed or to be agreed with the municipality, provided for in the VPM 014 VENTURE, in view of the use of the road and part of the lane of Av. Brazil.

Given the topography and limitations in the operational range, the works of the superstructure must be carried out observing the construction sequence, presented below:

- a) Replacement of TR 68 rails with UIC 60. To this end, a fastening set (support plates and elastic clamps) must be provided in sufficient quantity for at least 1 km of road. This fixation is temporary, and is part of the construction method. Provisionally, the drilling of wooden sleepers must be "billeted";
- b) Replacement of wooden sleepers with monoblock concrete sleepers;
- c) Cleaning of the ballast to the underside of the sleepers. This cleaning must be in segments and interspersed, always associated with the discharge of new ballast (first discharge), in order to avoid problems with the stability of the track;
- d) Replacement of the LCD located on the service fronts, as measured by the progress of interventions on the running track. The replacement of LCD includes the replacement of the respective sleeper sets;
- e) Location and leveling of the road, following the project quotas;
- f) Complementary discharge and regularization of the ballast;
- g) Mechanized lifting of the grid in successive steps up to the design level - minimum lift of 25 cm in relation to the current level;
- h) Tamping, leveling and final alignment of the grid following the project dimensions.

NOTE:

If the CONCESSIONAIRE adopts a different construction method, the new methodology must be submitted for analysis and CERTIFICATION, subsidizing the non-objection of ARTESP, accompanied by the technical justification and indication of the advantage of the proposed change, at least 30 days before the start of the work.

The railway bridges at km 32+240, km 34+540 and km 37+414 are detailed in EXHIBIT II.A, items 8.1,

8.2 and 8.3, EMPREENDIMENTOS OAE 001, OAE 002 and OAE 003, respectively.

7 VPM 007 AND RDA 005 VENTURE - SUZANO TO STUDENTS SECTION

In this section, the modernization services of the PERMANENT TRACK system, routes 1 and 2, and replacement of the fixed OVERHEAD TRACTION NETWORK with self-compensated ones will be carried out.

Scope of modernization of this section:

- Replacement of the fixed aerial network for the self-compensating aerial network;
- Execution of slope containment and strip sealing works;
- Drainage works involving the recovery of the lining of existing channels on the railway track along this stretch;
- Implementation of para-ballast, where the difference in level between the surface of the sleeper and the offset of the ballast is greater than 65cm;
- Replacement of all existing wooden sleepers in this stretch with monoblock concrete sleepers;
- Replacement of TR57 rails with UIC 60, in the full length of this section;
- Replacement of 50% of the existing LCD/crossings in this section;
- Total Log Truck;
- Ballast complementation; and
- Tamping, leveling and mechanized alignment of running track and LCD.

Given the topography and limitations in the operational range, the works of the superstructure must be carried out observing the construction sequence, presented below:

- a) Replacement of TR 57 rails with UIC 60. To this end, a fastening set (support plates and elastic clamps) must be provided in sufficient quantity for at least 1 km of road. This fixation is temporary, and is part of the construction method. Provisionally, the drilling of wooden sleepers must be "billeted";
- b) Replacement of wooden sleepers with monoblock concrete sleepers;

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- c) Cleaning of the ballast to the underside of the sleepers. This cleaning must be in segments and interspersed, always associated with the discharge of new ballast (first discharge), in order to avoid problems with the stability of the track;
- d) Replacement of the LCD located on the service fronts, as measured by the progress of interventions on the running track. The replacement of LCD includes the replacement of the respective sleeper sets;
- e) Location and leveling of the road, following the project quotas;
- f) Complementary discharge and regularization of the ballast;
- g) Mechanized lifting of the grid in successive steps up to the design level - minimum lift of 25 cm in relation to the current level;
- h) Tamping, leveling and final alignment of the grid following the project dimensions.

NOTE:

Before replacing the TR57 rail, the CONCESSIONAIRE must carry out a detailed survey of the conservation conditions of this material.

The rail must be cut with a disc saw in order to avoid structural damage to the material.

This material must be collected and correctly stored, for future use by the CONCESSIONAIRE itself on LINE 12-Safira, where the tracks are with TR57.

If the CONCESSIONAIRE adopts a different construction method, the new methodology must be submitted to analysis for CERTIFICATION, subsidizing the non-objection of ARTESP, accompanied by the technical justification and indication of the advantage of the proposed change, at least 30 days before the start of the work, observing the following specifications:

- i. Between the Mogi das Cruzes and Estudantes Stations, the operational range is totally confined and to facilitate the logistics of the work, specifically for this stretch, the CONCESSIONAIRE may evaluate the possibility of serving passengers with single-track operation, provided that it does so in a planned manner and through ample communication at least one month in advance to users, without prejudice to the operational interval provided for in EXHIBIT III.A, and may opt for the total prohibition of one of the roads during the execution of the modernization works of the PERMANENT TRACK and OVERHEAD TRACTION NETWORK systems.
- ii. Between Jundiapéba and Mogi das Cruzes, the CONCESSIONAIRE may evaluate the possibility of performing the modernization services during the day, from 9 a.m. to 3 p.m., with

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

alternating interdiction of roads 1 and 2, as follows:

- a. Execution of work on VIA 1, with interdiction: The circulation of trains, in both directions, must be on VIA 2, in the section between Crossbeams 01 UR35 (km 41 P16) and Crossbeams 09 UR 37 (km 48 P18). In this case, the service at Jundiapéba and Braz Cubas stations will only be through the respective VIA 2 platforms;
- b. Execution of work on VIA 2, with interdiction: The circulation of trains, in both directions, must be through VIA 1, in the section between Crossbeams 01 UR36 (km 42 P17) and Crossbeams 07 UR 37 (km 48 P15). In this case, service at Braz Cubas stations will only be through platform 1;
- c. In the evaluation, the CONCESSIONAIRE must consider the aspects of comfort and safety of users, and if feasible, with prior authorization from ARTESP, the modernization services of the VP and RA may be performed during this period.

The services mentioned in the items i and ii they cannot be concomitant.

8 VENTURE VPM 008 AND RDA 006 - EXTENSION STUDENTS TO CESAR DE SOUZA

For this project, the CONCESSIONAIRE is obliged to carry out field surveys and preliminary studies for the preparation of the BASIC and EXECUTIVE PROJECTS, including: cadastral planialtimetric topographic survey; geological and geotechnical prospecting and studies; and hydrological studies. In possession of these documents, the CONCESSIONAIRE must prepare all the BASIC and EXECUTIVE PROJECTS observing the documents contained in EXHIBIT XI, including the third copy intended for the segregation of freight trains, submitting them for analysis and non-objection by ARTESP. Along with the projects, the plans for the assembly and implementation of the Construction works must be forwarded.

Once the projects and the EXECUTION PROGRAM are approved, the CONCESSIONAIRE must mobilize the company responsible for the implementation of the works, including: earthworks; urbanization works; drainage works; earth works and containments; special engineering works (railroad bridges); lane sealing; infrastructure construction, supply and assembly of the PERMANENT TRACK superstructure (running track and LCD) and supply and assembly of the self-compensating TRACTION AREA NETWORK, following the road, following the BASIC and EXECUTIVE PROJECTS.

The BASIC and EXECUTIVE PROJECTS must be submitted to MRS Logística's consent before the execution of the works, as provided for in the term of commitment provided for in EXHIBIT XI, whose provisions are mandatory for the CONCESSIONAIRE.

NOTE:

The construction method proposed by the CONCESSIONAIRE shall ensure the uninterrupted operation

of MRS's cargo transportation system, both on the circulation road and in the parking yard located in the vicinity of the future Cesar de Souza station.

The new circulation road and parking yard must comply with the technical standards and specifications mentioned above.

9 VPM 009 AND RDA 007 VENTURE - BRÁS A SE ENGENHEIRO GUALBERTO SECTION

In this section, the modernization services of the PERMANENT TRACK system, routes 2 and 4, and replacement of the fixed OVERHEAD TRACTION NETWORK with self-compensated ones, will be carried out. It should be noted that the Engenheiro São Paulo Complex is located in this section, which requires the CONCESSIONAIRE to pay special attention to the planning of activities and interventions in the infrastructure and superstructure of the roads.

It should also be noted that in this same stretch, the operational track is shared with tracks 1 and 3, where the trains of LINES 11-Coral and 13-Jade circulate, and freight trains and under no circumstances should these services be interrupted.

Scope of modernization of this section:

- Replacement of the fixed aerial network for the self-compensating aerial network;
- Implementation of deep drains and surface drainage channels of the railway strip;
- Implementation of para-ballast, where the unevenness between the surface of the sleeper and the offset of the ballast is greater than 65cm;
- Replacement of all existing wooden sleepers in this stretch with monoblock concrete sleepers;
- Replacement of TR57 rails for UIC 60, in the full length of this section;
- Replacement of LCD/indents in the AREMA standard with equipment in the UIC 60 standard;
- Total ballast change; and
- Tamping, leveling and mechanized alignment of running track and LCD.

As mentioned, this section is extremely loaded and because of this, in the planning of interventions in the superstructure of the road, the following executive sequence must be adopted:

- a) Replacement of TR 57 rails with UIC 60. To this end, a fastening set (support plates and elastic clamps) must be provided in sufficient quantity for at least 1 km of road. This fixation is

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

temporary, and is part of the construction method. Provisionally, the drilling of wooden sleepers must be "billeted"

- b) Replacement of wooden sleepers with monoblock concrete sleepers;
- c) Cleaning of the ballast to the underside of the sleepers. This cleaning must be in segments and interspersed, always associated with the discharge of new ballast (first discharge), in order to avoid problems with the stability of the track;
- d) Replacement of LCD located on the service fronts, measured by the progress of interventions on the running track. The replacement of LCD includes the replacement of the respective sleeper sets;
- e) Location and leveling of the road, following the project quotas;
- f) Complementary discharge and regularization of the ballast;
- g) Mechanized lifting of the grid in successive steps up to the design level - minimum lift of 25 cm in relation to the current level;
- h) Tamping, leveling and final alignment of the grid following the project dimensions.

NOTE:

If the CONCESSIONAIRE adopts a different construction method, the new methodology must be submitted to analysis for CERTIFICATION, subsidizing the non-objection of ARTESP, accompanied by the technical justification and indication of the advantage of the proposed change, at least 30 days before the start of the work.

Once the implementation services of the works of the freight track and its commissioning are completed, the use of the area should be regularized and the maintenance of this new road will be the responsibility of MRS.

10 VENTURE VPM 010 AND RDA 008 – STRETCH FROM ENGENHEIRO GUALBERTO TO ENGENHEIRO GOULART (12+800*)

The modernization of this stretch is associated with the extension works of LINE 13-Jade from Engenheiro Goulart to the future Gabriela Mistral station, where the integration of LINES 12-Safira and 13-Jade with LINE 2-Green of the Metro, in the implementation phase, is planned.

In the BASIC and EXECUTIVE PROJECTS for the extension of LINE 13-Jade, the relocation of the axes of tracks 1 and 2 of LINE 12-Safira to the right side of the railway lane (increasing direction of mileage), necessary to accommodate the tracks of LINE 13-Jade, a solution given for the stretch already in

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

operation, should be considered. In this way, the phases of the works necessarily include the modernization of the infrastructure and superstructure of the LINE 12-Safira tracks, including: earthworks, containments, drainage, special works of art (adequacy of PI's); lane sealing; and assembly of the new tracks following the same pattern adopted on the occasion of the implementation of LINE 13-Jade. The new tracks of LINES 12-Safira and 13-Jade must be assembled with concrete monoblock sleepers, rails and UIC type LCD's, connecting with the modernization works of the VPM 010 VENTURE.

In this section, the OVERHEAD TRACTION NETWORK must be repositioned, according to changes in the axes of the roads and the implementation of a new Signalized Road Plan. The network must be self-compensating throughout the stretch.

NOTE:

Within the expansion works of LINE 13-Jade, it is necessary to expand the viaduct over Rua Souza de Melo (km 14+035) and the reconstruction of the footbridge at km 14+380, which are detailed in VENTURES OAE 007 and PIS 009 of EXHIBIT II.A.

11 VPM 011 AND RDA 009 - USP LESTE A ENGENHEIRO MANOEL FEIO

In this section, the modernization services of the PERMANENT TRACK system will be carried out, tracks 1 and 2 where passenger trains of LINE 12-Safira and freight trains operated by MRS circulate. The replacement of the fixed OVERHEAD TRACTION NETWORK with self-compensated will also be carried out.

It should be noted that in the stretch between Jardim Romano and Engenheiro Manoel Feio there are cargo terminals with rail access and in the planning of activities, these accesses must be preserved.

Unlike the other VENTURES, in the case of this section, the projects and planning of the modernization works may consider the possibility of implementing a new track next to the current track 1 (right side in the increasing direction of the mileage), respecting the passages through the intermediate stations, which minimizes the impact on the circulation of the trains of LINE 12, that is, Modernization must consider the best possible use of the right-of-way. Once the new track is completed, or as the works progress, the signaling and train circulation systems (track 1) are migrated to the new axis, deactivating the current track 1. Once this is done, the superstructure modernization services are concentrated on the deactivated track (1) and at the end of the works, or as the service fronts advance, the signaling and circulation system of the trains from track 2 to the remodeled track is migrated.

As a result, the axes of the current roads 1 and 2 now occupy the right side of the lane (increasing direction of mileage), with the bed of track 2 remaining deactivated for future expansion of rail transport services, such as the TIC São José dos Campos.

Scope of modernization of this section

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- Replacement of the fixed aerial network for the self-compensating aerial network;
- Execution of slope containment and lane sealing works;
- Execution of drainage works and with emphasis on the crossing of the Três Pontes Stream at km 31+850, where the flow section must be expanded by the non-destructive method (tunnel liner);
- Replacement of all existing wooden sleepers in this stretch with monoblock concrete sleepers;
- Replacement of TR57 rails with rails of the same profile, segments where it has a wear limit of 25% of the billet area;
- Replacement of 50% of the existing LCD/crossings in this section;
- Total Log Truck;
- Ballast complementation;
- Tamping, leveling and mechanized alignment of running track and LCD; and
- Demolition of the existing platforms of the old São Miguel Paulista station.

The CONCESSIONAIRE must adopt the following executive sequence in the planning of activities:

- a) Replacement of TR 57 rails with rail of the same profile;
- b) Replacement of wooden sleepers with monoblock concrete sleepers;
- c) Cleaning of the ballast to the underside of the sleepers. This cleaning must be in segments and interspersed, always associated with the discharge of new ballast (first discharge), in order to avoid problems with the stability of the track;
- d) Replacement of all existing LCD in this section, this replacement being as the interventions on the running road progress. The replacement of LCD includes the replacement of the respective sleeper sets;
- e) Rental and leveling of the running track and LCD's, following the project quotas;
- f) Complementary discharge and regularization of the ballast;
- g) Minimum mechanized lifting of 25 cm from the grid in relation to the current elevation in

successive steps up to the project elevation;

- h) Tamping, leveling and final alignment of the grid following the project dimensions.

NOTE:

Before raising the railroad grid, the CONCESSIONAIRE must evaluate any impacts on the structures of the OVERHEAD TRACTION NETWORK and, if necessary, include in the planning of the services the necessary relocations.

If the CONCESSIONAIRE adopts a different construction method, the new methodology must be submitted to analysis for CERTIFICATION, subsidizing the non-objection of ARTESP, accompanied by the technical justification and indication of the advantage of the proposed change, at least 30 days before the start of the work.

The expansion of the section of the crossing of the Três Pontes Stream is detailed in EXHIBIT II.A, OAC 001 VENTURE.

12 VPM 012 AND RDA 010 VENTURE – ENGENHEIRO MANOEL FEIO TO CALMON VIANA STRETCH

In this section, the modernization services of the PERMANENT TRACK system, routes 1 and 2, and the replacement of the fixed OVERHEAD TRACTION NETWORK with self-compensated ones, will be carried out.

Scope of modernization of this section:

- Replacement of the fixed aerial network for the self-compensating aerial network;
- Execution of slope containment and strip sealing works;
- Drainage and slope containment works;
- Implementation of para-ballast, where the unevenness between the surface of the sleeper and the offset of the ballast is greater than 65cm;
- Replacement of all existing wooden sleepers in this stretch with monoblock concrete sleepers;
- Replacement of TR57 rails with rails of the same profile, segments that have a wear limit of 25% of the billet area;
- Replacement of 50% LCD's/crossbeams existing in this section;

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- Total Log Truck;
- Ballast complementation; and
- Tamping, leveling and mechanized alignment of running track and LCD.

Given the topography and limitations in the operational range, the works of the superstructure must be carried out observing the construction sequence, presented below:

- a) Replacement of TR 57 rails with rail of the same profile;
- b) Replacement of wooden sleepers with monoblock concrete sleepers;
- c) Cleaning of the ballast to the underside of the sleepers. This cleaning must be in segments and interspersed, always associated with the discharge of new ballast (first discharge), in order to avoid problems with the stability of the track;
- d) Replacement of the LCD located on the service fronts, as measured by the progress of interventions on the running track. The replacement of LCD includes the replacement of the respective sleeper sets;
- e) Location and leveling of the road, following the project quotas;
- f) Complementary discharge and regularization of the ballast;
- g) Minimum mechanized lifting of 25 cm from the grid in relation to the current elevation in successive steps up to the project elevation;
- h) Tamping, leveling and final alignment of the grid following the project dimensions.

NOTE:

Before raising the railroad grid, the CONCESSIONAIRE must evaluate any impacts on the structures of the OVERHEAD TRACTION NETWORK and, if necessary, include in the planning of the services the necessary relocations.

If the CONCESSIONAIRE adopts a different construction method, the new methodology must be submitted to analysis for CERTIFICATION, subsidizing the non-objection of ARTESP, accompanied by the technical justification and indication of the advantage of the proposed change, at least 30 days before the start of the work.

In the stretch between Itaquaquecetuba and Calmon Viana Stations, the CONCESSIONAIRE may evaluate the possibility of performing modernization services during the day, from 9 a.m. to 3 p.m.,

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

with alternating interdiction of tracks 1 and 2, as follows:

- i. Execution of the work on track 1, with interdiction: The circulation of trains, in both directions, must be on track 2, in the section between Crossbeam 05 UR30 (km 40 P7) and Crossbeam 03 UR 16 (km 35 P16). In this case, the service at the Aracaré station will only be through platform 2;
- ii. Execution of the work on track 2, with interdiction: The circulation of trains, in both directions, must be on VIA 1, in the section between Crossbeam 01 UR30 (km 40 P15) and Crossbeam 03 UR 15 (km 34 P27A). In this case, the service at the Itaquaquecetuba and Aracaré stations will only be through the respective VIA 1 platforms.
- iii. In the evaluation, the CONCESSIONAIRE must consider the aspects of comfort and safety of users, and if feasible, with prior authorization from the GRANTING AUTHORITY, the modernization services of the PERMANET TRACK and OVERHEAD TRACTION NETWORK may be performed during this period.

13 VPM 013 AND RDA 011 VENTURE - CALMON VIANA EXTENSION TO SUZANO

This VENTURE involves the expansion of LINE 12-Safira between Calmon Viana and Suzano, which will occur simultaneously with the solution of the VPM 007 VENTURE, including the reurbanization of Av. Brasil (earthworks, drainage, paving, horizontal signaling and urbanization), whose bed will be occupied by track 1 of LINE 11-Coral. Once the BASIC and EXECUTIVE PROJECTS and the EXECUTION PROGRAM have been approved, the CONCESSIONAIRE must mobilize the Company responsible for the implementation of the works, including:

- Implementation of the self-compensated aerial network;
- Earthworks;
- Drainage works of the railway system;
- Earthworks and containments;
- Strip sealing;
- Horizontal and vertical signaling of the road system; and
- Supply and assembly of the permanent track superstructure (via running and LCD), following the project data.

It is important to highlight that the extension of LINE 12-Safira depends on the relocation of Line 11 – Coral and the railway bridge over the Guaió River, whose implementation is contemplated in the VPM

007 VENTURE. In this section, the self-compensated OVERHEAD TRACTION NETWORK must be implemented, following the PERMANENT TRACK.

14 VPM 014 AND RDA 012 VENTURE - GUARULHOS AND BONSUCESSO AIRPORT STRETCH

For this VENTURE, the CONCESSIONAIRE must prepare all the BASIC and EXECUTIVE PROJECTS, including the urbanization project of the local road affected by the works and the expropriation "mosaic", submitting them for analysis and not objection by ARTESP, previously counting on the CERTIFICATION of the IMPLEMENTATION CERTIFIER. Once the projects and the EXECUTION PROGRAM are approved, the CONCESSIONAIRE must mobilize the implementation of the works including, at least:

- Earthworks;
- Road adaptation and urbanization works;
- Drainage works;
- Earthworks and containments;
- Tunnel;
- Special works of art (elevated);
- Strip sealing;
- Implementation of a self-compensating aerial network;
- Supply and assembly of the permanent track superstructure (running track and LCD), including the rail yard; and
- Urbanization works.

Layout and special works of art for the stretch:

- a) The track should initially maintain the tangent already used by the Airport-Guarulhos station, crossing one of the access loops of the Hélio Smidt Highway and, concomitantly, the Baquirivú River, while opening a third line already in its first current meters and which will serve as an escape route for any failures of compositions or operational deviations.
- b) This third line will extend along the elevated of the main lines, as a widening of the slab, following the characteristics of the stretch already implemented to the Jardim dos Eucaliptos station.

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- c) The route enters dense urban areas, indicating the need for removal, resettlement and expropriation.
- d) After the stretch to the Jardim dos Eucaliptos station, the line deflects to the right and heads east, crossing under the lanes of the future connecting loop between the northern section of the Rodoanel and Guarulhos Airport, requiring the expansion of a partially implemented road viaduct.
- e) The route should continue to the urbanized region of the São João neighborhood, where the station of the same name is planned.
- f) Near the stretch of implementation of the São João Station, the installation of a set of LCD that will form a universal crossing should be planned.
- g) After this stretch, the main road continues, deflecting to the right and crossing Estrada das Lavras. From then on, the route must observe the templates of the future reservoirs and flooding areas provided for in the Baquirivú River channeling project until the end of the road extension, preferably following the left bank to align with the platforms of the future Presidente Dutra and Bonsucesso stations.

NOTE:

The layout and geometric design of such stretch must consider the future undertakings and projects in progress of the Municipality of Guarulhos, as well as be aligned with the prospections and projects of the São Paulo International Airport, to be made available by the concessionaire *GRU Airport*, with regard to the Airport Master Plan approved, or validated, by ANAC for the airport during the design and implementation phases of the VENTURE.

The non-binding reference project of the route between the Guarulhos Airport and Bonsucesso section, which is the basis of the VPM 015 and RDA 012 VENTURES, provided to the CONCESSIONAIRE is in accordance with the response letter to the consultation carried out by CPTM to the National Civil Aviation Secretariat – SAC (LETTER No. 60/2023/DOPR -SAC-MPOR/SAC – MPOR), which informed the absence of obstacles to the continuation of the preliminary project. However, the same letter reiterates that a new consultation with this body should be made before the start of subsequent phases of the project, in order to verify the compatibility of the VENTURE with the possible implementation of a future runway at the airport.

The VPM 015 and RDA 012 VENTURES should consider the proximity to the existing urban public transport terminals, especially the São João Terminal, and future ones, such as the Bonsucesso Terminal next to the Bonsucesso station, seeking to minimize interventions in the current vehicular flows and bus routes.

The construction of the stretch between Guarulhos Airport and Bonsucesso should consider the

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

current works of art, drainage works and channeling under implementation and planned by the Municipality of Guarulhos and the Government of the State of São Paulo for the Baquirivú River, so that there are no incompatibilities between the projects.

The BASIC and EXECUTIVE PROJECT must consider the compatibility with Line 14 - Onyx of CPTM (future project), in the stretch between Bonsucesso station and the final section.

15 VPM 015, 016, 017, 018, 019, 020 AND RDA 013, 014, 015, 016, 017, 018

These VENTURES will be carried out next to the Bom Retiro, Lajeado, Itaquaquecetuba, Jundiapéba, Mogi das Cruzes and Estudantes stations, and should be implemented together with the VENTURES of their respective civil works, according to EXHIBIT II.A. At the location of each station, the existing PERMANENT TRACK must be relocated in order to allow the construction of a central platform that allows the boarding and disembarking of passengers. The construction method to be used by the CONCESSIONAIRE shall consist of stages that do not affect the operation of LINES 11-Coral, 12-Safira and 13-Jade, as well as the other concessionaires present in the region. The new PERMANENT TRACK should maintain the standard of the immediately adjacent road developments.

16 VPM 021 AND RDA 019 VENTURE - LUZ COMPLEX

The following comprise the modernization works of the Light Complex on PERMANENT TRACK and OVERHEAD TRACTION NETWORK:

Scope of modernization:

- Demolition of existing roads, LCD and overhead network, including the removal of materials from the demolition;
- Removal of contaminated ballast;
- Execution of drainage works, superficial and deep;
- Assembly of the tracks following the new geometric design, considering the application of the materials specified below:
 - a. Standard crushed stone ballast No. 3;
 - b. 2.80 concrete monoblock sleepers for yard roads;
 - c. TR 57 Rail;
 - d. Elastic fixation;

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- e. LCD's following the openings indicated in the geometric design;
- f. Special wooden sleepers for the LCD.

NOTE:

Where the unevenness between the surface of the sleeper and the ballast offset is greater than 65cm, consider the deployment of ballast.

The rental, assembly and leveling of the roads must follow the project quotas.

The tamping of roads and LCD must be mechanized.

The planning of the modernization works and construction method must be defined by the CONCESSIONAIRE.

Assembly of OVERHEAD TRACTION NETWORK, considering the application of the following materials:
Metal pole; 253 mm² messenger cable and 107 mm² contact wire.

17 VPM 022 AND RDA 020 VENTURE - ENGENHEIRO SÃO PAULO SHELTER

The following comprise the modernization works of the Engenheiro São Paulo Shelter on PERMANENT TRACK and OVERHEAD TRACTION NETWORK:

Scope of modernization:

- Demolition of existing roads, LCD and overhead network, including the removal of materials from the demolition;
- Removal of contaminated ballast;
- Execution of drainage works, superficial and deep;
- Assembly of the tracks following the new geometric design, considering the application of the materials specified below:
 - a. Standard crushed stone ballast No. 3;
 - b. 2.80 concrete monoblock sleepers for yard roads;
 - c. TR 57 Rail;
 - d. Elastic fixation;

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- e. LCD's, following the openings indicated in the geometric project;
- f. Special wooden sleepers for the LCD.

NOTE:

Where the unevenness between the surface of the sleeper and the ballast offset is greater than 65cm, consider the deployment of ballast.

The rental, assembly and leveling of the roads must follow the project quotas.

The tamping of roads and LCD must be mechanized.

The planning of the modernization works and construction method must be defined by the CONCESSIONAIRE.

Assembly of OVERHEAD TRACTION NETWORK, considering the application of the following materials:
Metal pole; 253 mm² messenger cable and 107 mm² contact wire.

18 VPM 023 AND RDA 021 VENTURE - TEST ROUTE

New VENTURE that should be implemented together with the extension works of LINE 11-Coral. The location of the test track must be defined by the CONCESSIONAIRE taking into account geometric elements such as null and tangent grids, as well as the proximity of this track to any of the main maintenance complexes of LINE 11-Coral.

Deployment Scope:

- Preparation of BASIC and EXECUTIVE PROJECTS;
- Execution of land cleaning services;
- Execution of earthmoving services;
- Execution of drainage works, superficial and deep;
- Construction of service platforms;
- Implementation of the OVERHEAD TRACTION NETWORK;
- Lane sealing (patio area);

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- Assembly of the tracks following the new geometric design, considering the application of the materials specified below:
 - a. Standard crushed stone ballast No. 3;
 - b. 2.80 concrete monoblock sleepers for yard roads;
 - c. Standard rails to be defined by the CONCESSIONAIRE;
 - d. LCD's following the openings indicated in the geometric design;
 - e. Special concrete sleepers for the LCD.

NOTE:

Where the unevenness between the surface of the sleeper and the ballast offset is greater than 65cm, consider the deployment of ballast.

The rental, assembly and leveling of the roads must follow the project quotas.

The tamping of roads and LCD must be mechanized.

The planning of the modernization works and construction method must be defined by the Concessionaire.

Assembly of OVERHEAD TRACTION NETWORK, considering the application of the following materials: Metal pole; 253 mm² messenger cable and 107 mm² contact wire.

19 VPM 024 VENTURE – MAINTENANCE AND STORAGE BASE FOR BALLAST AND SLEEPERS

The maintenance and storage base of ballast and sleepers is used for maintenance of PERMANENT TRACK, including the storage of materials used in this system and in order to optimize resources, as well as the physical spaces intended for these purposes, the site must undergo modernization works, contemplating, at least, the following activities:

Scope of modernization:

- Preparation of BASIC and EXECUTIVE PROJECTS;
- Execution of land cleaning services;
- Execution of earthmoving services;

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- Execution of drainage works, superficial and deep;
- Assembly of the tracks following the new geometric design, considering the application of the materials specified below:
 - a. Standard crushed stone ballast No. 3;
 - b. Sleepers for patio paths;
 - c. Standard rails to be defined by the CONCESSIONAIRE;
 - d. LCD's following the openings indicated in the geometric design;
 - e. Special wooden sleepers for the LCD.

NOTE:

The CONCESSIONAIRE, at its discretion, may change the location of this maintenance base to another of its best convenience.

Where the unevenness between the surface of the sleeper and the ballast offset is greater than 65cm, consider the deployment of ballast.

The location, assembly and leveling of the roads must follow the project quotas.

The tamping of roads and LCD must be mechanized.

The planning of the modernization works and construction method must be defined by the CONCESSIONAIRE.

20 VPM 025 VENTURE – RAIL WELDING YARD

This is a new VENTURE that must be implemented within the AGREEMENT of LINES 11-Coral, 12-Safira and 13-Jade, replacing the sharing of the currently existing facilities in the Pirituba Yard. This yard is located in the territory of Line 7, granted to the TIC TRENS Concessionaire and in order to give autonomy and optimize the logistics of transporting welded long rails, this activity should be transferred to the territory of LINES 11-Coral, 12-Safira and 13-Jade.

In addition to the production of welded long rails, the shipyard of short bar rails must be implemented, and to enable the transport of this material, integrated with the fixed facilities, road and rail access roads must be implemented, under the terms of the scope of the PAT 007 VENTURE, to the welding machine and parking of the composition used in the loading and transport of welded long rail.

Deployment scope:

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- Execution of the BASIC and EXECUTIVE PROJECTS;
- Execution of land cleaning services;
- Execution of earthmoving services;
- Execution of drainage works, superficial and deep;
- Assembly of the tracks following the new geometric design, considering the application of the materials specified below:
 - a. Standard crushed stone ballast No. 3;
 - b. Sleepers for patio paths;
 - c. Standard rails to be defined by the CONCESSIONAIRE;
 - d. LCD's, following the openings indicated in the geometric project;
 - e. Special concrete sleepers for the LCD.

NOTE:

The CONCESSIONAIRE, at its discretion, may implement this shipyard in the place of its best convenience.

Where the unevenness between the surface of the sleeper and the ballast offset is greater than 65cm, consider the deployment of ballast.

The rental, assembly and leveling of the roads must follow the project quotas.

The tamping of roads and LCD must be mechanized.

The planning of the modernization works and construction method must be defined by the Concessionaire.

21 VPM 026 AND RDA 022 VENTURE – TRAIN WASHER

This is a new VENTURE that must be implemented within the AGREEMENT of LINES 11 - Coral, 12 - Safira and 13 - Jade, replacing the currently existing facilities, with the objective of optimizing the washing of the train fleet. In addition to the washer, a new yard should be implemented to be used,

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

both for parking and for internal cleaning of the trains of the fleets of LINES 11-Coral, 12-Safira and 13-Jade.

Deployment Scope:

- Execution of the BASIC and EXECUTIVE PROJECTS;
- Execution of land cleaning services;
- Execution of earthmoving services;
- Execution of drainage works, superficial and deep;
- Assembly of the tracks following the new geometric design, considering the application of the materials specified below:
 - a. Standard crushed stone ballast No. 3;
 - b. 2.80 concrete monoblock sleepers for yard roads;
 - c. Standard rails to be defined by the CONCESSIONAIRE;
 - d. Elastic fixation;
 - e. LCD's following the openings indicated in the geometric design;
 - f. Special concrete sleepers for the LCD.

NOTE:

The CONCESSIONAIRE, at its discretion, may deploy this washer in the place of its best convenience.

Where the unevenness between the surface of the sleeper and the ballast offset is greater than 65cm, consider the deployment of ballast.

The rental, assembly and leveling of the roads must follow the project quotas.

The tamping of roads and LCD must be mechanized.

The planning of the modernization works and construction method must be defined by the CONCESSIONAIRE.

Assembly of OVERHEAD TRACTION NETWORK, considering the application of the following materials:
Metal pole; 253 mm² messenger cable and 107 mm² contact wire.

22 VPM 027 AND RDA 023 – PÁTIO CESAR DE SOUZA

The Cesar de Souza yard must be implemented together with the extension works of LINE 11, and the provisions contained in EXHIBIT XI must be observed, where the implementation of a new station that will become the terminal of this LINE is planned. Such VENTURE also involves the implementation of roads for the MRS yard, whose maintenance responsibility will be MRS itself after the completion of the works.

Deployment Scope:

- Execution of the BASIC and EXECUTIVE PROJECTS;
- Execution of land cleaning services;
- Execution of earthmoving services;
- Execution of drainage works, superficial and deep;
- Construction of service platforms;
- Lane sealing (patio area);
- Assembly of the tracks following the new geometric design, considering the application of the materials specified below:
 - a. Standard crushed stone ballast;
 - b. 2.80 m sleepers for yard tracks;
 - c. Standard rails to be defined by the CONCESSIONAIRE;
 - d. Elastic fixation;
 - e. LCD's, following the openings indicated in the geometric project;
 - f. Special concrete sleepers for the LCD.

NOTE:

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

Where the unevenness between the surface of the sleeper and the ballast offset is greater than 65cm, consider the deployment of ballast.

The rental, assembly and leveling of the roads must follow the project quotas.

The tamping of roads and LCD must be mechanized.

The planning of the modernization works and construction method must be defined by the CONCESSIONAIRE.

Assembly of OVERHEAD TRACTION NETWORK, considering the application of the following materials: Metal pole; 253 mm² messenger cable and 107 mm² contact wire.

The construction method proposed by the CONCESSIONAIRE shall ensure the uninterrupted operation of MRS's cargo transportation system, both on the circulation road and in the parking yard located in the vicinity of the future Cesar de Souza station.

The new circulation road and parking yard must comply with the technical standards and specifications mentioned above.

This VENTURE shall comply with the provisions of the MRS-CPTM AGREEMENT and the Term of Commitment in this regard, signed between MRS and SPI, contained in EXHIBIT XI.

23 VPM 028 VENTURE – METALLURGY MAINTENANCE BASE

PERMANENT TRACK maintenance area, including the storage of materials used in this system and in order to optimize resources, as well as the physical spaces intended for these purposes, the PERMANENT TRACK system, must undergo modernization works within the AGREEMENT of LINES 11-Coral, 12-Safira and 13-Jade, contemplating, at least, the following activities:

Scope of modernization:

- Execution of the BASIC and EXECUTIVE PROJECTS;
- Execution of land cleaning services;
- Execution of earthmoving services;
- Execution of drainage works, superficial and deep;
- Assembly of the tracks following the new geometric design, considering the application of the materials specified below:

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- a. Standard crushed stone ballast No. 3;
- b. 2.80 sleepers for yard tracks;
- c. Standard rails to be defined by the CONCESSIONAIRE;
- d. LCD's, following the openings indicated in the geometric project;
- e. Special wooden sleepers for the LCD.

NOTE:

Where the unevenness between the surface of the sleeper and the ballast offset is greater than 65cm, consider the deployment of ballast.

The rental, assembly and leveling of the roads must follow the project quotas.

The tamping of roads and LCD must be mechanized.

The planning of the modernization works and construction method must be defined by the CONCESSIONAIRE.

24 VPM 029 AND RDA 024 VENTURE – ITAIM PAULISTA YARD

This VENTURE involves modernization works, contemplating, at least:

Scope of modernization:

- Replacement of existing wooden sleepers in this stretch (Itaim Paulista yard);
- Replacement of TR57 rails, at points where this component shows wear above the limit of 25% of the billet area;
- Replacement of special wooden sleepers of the existing LCD's/Crossbeams in these Yards;
- Replacement of turnout components that show wear (set of points and set of frogs);
- Ballast complementation;
- Tamping, leveling and mechanized alignment of running track and LCD;
- General overhaul of the catenary including checking the tension of the cables (messenger

and contact wire) and replacement of support components, where applicable.

25 VPM 030 AND RDA 025 VENTURE – ENGENHEIRO MANOEL FEIO YARD

This VENTURE involves modernization works, including:

Scope of modernization:

- Cleaning of the surface drainage system;
- Replacement of special wooden sleepers of the existing LCD's/Crossbeams in these Yards;
- Replacement of turnout components that show wear (set of points and set of frogs);
- Ballast complementation;
- Tamping, leveling and mechanized alignment of running track and LCD;
- General overhaul of the catenary including checking the tension of the cables (messenger and contact wire) and replacement of support components, where applicable.

26 VPM 031 VENTURE – CALMON VIANA BASE

Currently this base is used for the maintenance of the PERMANENT TRACK and the OVERHEAD TRACTION NETWORK, including the storage of materials used in these systems and with the objective of optimizing resources, as well as the physical spaces intended for these purposes, the PERMANENT TRACK system and the maintenance site of the OVERHEAD TRACTION NETWORK, must undergo modernization works within the AGREEMENT of LINES 11-Coral, 12-Safira and 13-Jade, contemplating, at least, the following activities:

Scope of modernization:

- Execution of land cleaning services;
- Execution of earthmoving services;
- Execution of drainage works, superficial and deep;
- Assembly of the tracks following the new geometric design, considering the application of the materials specified below:
 - a. Standard crushed stone ballast No. 3;

SPI PROCESS nº 021.00000891/2024-87
INTERNATIONAL COMPETITION No. 02/2024
PPP LOTE ALTO TIETÊ

- b. 2.80 sleepers for yard tracks;
- c. Standard rails to be defined by the CONCESSIONAIRE;
- d. LCD's, following the openings indicated in the geometric project;
- e. Special wooden sleepers for the LCD.

NOTE:

Where the unevenness between the surface of the sleeper and the ballast offset is greater than 65cm, consider the deployment of ballast.

The rental, assembly and leveling of the roads must follow the project quotas.

The tamping of roads and LCD must be mechanized.

The planning of the modernization works and construction method must be defined by the Concessionaire.