

ANNEX 06

SERVICES CORRESPONDING TO CONSERVATION FUNCTIONS

SPONSORED CONCESSION OF PUBLIC SERVICES OF EXPANSION, OPERATION, MAINTENANCE AND MAKING OF INVESTMENTS NECESSARY FOR EXPLORATION OF THE ROAD SYSTEM CALLED RODOANEL NORTE LOT

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For the execution of any services specified in this ANNEX in which it is necessary to present engineering projects, they must be fed into SISPROJ. The specifications of this system are presented in APPENDIX F of the AGREEMENT.

The CONCESSIONAIRE shall ensure compliance with the requirements set out in the PERFORMANCE STANDARDS, available at <http://www.ifc.org/performancestandards> and the accompanying Guidance Notes, listed below:

- i. PS1: Assessment and Management of Social and Environmental Risks and Impacts
- ii. PS2: Labor and Working Conditions
- iii. PS3: Resource Efficiency and Pollution Prevention
- iv. PS4: Community Health and Safety
- v. PS5: Land Acquisition and Involuntary Resettlement
- vi. PS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- vii. PS7: Indigenous people
- viii. PS8: Cultural Heritage

The inclusion of new investments and the detailing of pertinent activities, related to the functions specified in this ANNEX, shall be registered and made available in the SISDEMANDA system, according to the rules established in the AGREEMENT and, especially, according to the processing described in APPENDIX G, observing the rules applicable to ORDINARY REVIEWS.

The provisions on adequacy and issues related to existing assets do not apply to the IMPLEMENTATION WORKS, but only to other interventions to be carried out after the completion of the IMPLEMENTATION WORKS.

1. ROUTINE CONSERVATION

1.1. General Provisions

The CONCESSIONAIRE is responsible for meeting the requirements set forth in this ANNEX, being certain that the burdens arising from the impossibility of meeting said requirements as a result of the project specifications contained in ANNEX 12, as well as any liabilities, irregularities, inaccuracies or failures identified during the PRE-CONSTRUCTION PERIOD shall be included in the INSPECTION REPORT and will be the object of economic and financial rebalancing of the AGREEMENT, pursuant to ANNEX 18.

1.2. Basic principles

1.2.1. Routine maintenance / maintenance

Set of services that are performed in the ROAD SYSTEM, agreement to pre-established standards or levels, in order to preserve investments, ensure traffic safety and USER comfort, in addition to maintaining the rational and economic flow of vehicles.

1.2.2. Planning

Routine conservation / maintenance of the ROAD SYSTEM is a basic function of its operation. Conservation/maintenance requires that, during the CONCESSION TERM, services that require a varied range of labor resources, equipment, vehicles, materials and tools are constantly performed.

In order to manage the conservation / maintenance efficiently and economically, the CONCESSIONAIRE must have an information and administration system, whose essential components are highlighted below, according to APPENDIX F:

- (a) road inventory, which identifies and quantifies all the constituent elements of the ROAD SYSTEM that generate conservation/maintenance services;
- (b) conservation / maintenance standards;
- (c) identification of the conservation/maintenance services necessary to maintain those elements at an adequate level for quality standards, reference tables, indexes and regulations in force;
- (d) annual work program; and
- (e) computerized reports for analysis of efficiency and costs at different management levels.

In the end, these components compete so that conservation/maintenance activities punctually comply with the results of the best combination of planning and allocated resources.

1.2.3. Road inventory

The road inventory is the quantification, survey and registration of the ROAD SYSTEM, including, but not limited to, the following elements: embankment, pavement, special works of art, current works of art, surface and deep drainage, vegetation covering, containment devices road, horizontal and vertical signaling (ground and aerial), safety equipment and traffic control, fences, street lighting, public utilities, buildings and operational and support yards.

The first road inventory must be delivered, according to the deadline in the table in item 5, and must be updated monthly and be available for consultation at any time, in order to allow its transfer through the communication channels established by ARTESP, whenever it deems convenient and in accordance with APPENDIX F.

1.2.3.1 Georeferenced video-record survey

In order to provide further subsidies to the road inventory, the CONCESSIONAIRE shall carry out annually, from the FULL COMMERCIAL OPERATION, a video-record survey of the ROAD SYSTEM as described in ANNEX 05.

1.2.3.2 Initial topographic survey of the ROAD SYSTEM

In order to provide greater support for the road inventory, as well as for the management of risks associated with the need to adapt safety elements, slopes and the drainage system, among others, and also to support the elaboration of eventual emergency projects, the initial topographic survey of the ROAD SYSTEM.

The topographic survey shall cover:

- i. surveying and processing of point clouds from the lane platform, in such a way that it is possible to detail slopes, steps and drainage and safety elements;
- ii. survey and cloud point processing of the runway platform, in such a way that it is possible to detail slope boundaries, drainage elements, fences and buildings up to the limits of the RIGHT-OF-WAY;
- iii. the surveys must be processed using the UTM system - Universal Transversa de Mercator, SIRGAS2000 base;
- iv. the current standards of the DER/SP and ARTESP design rules and instructions must be observed;
- v. drawings must be generated in dwg format or equivalent in the current standards of the DER/SP and ARTESP design rules and instructions, as well as a DTM (digital terrain model) in dwg format or equivalent;
- vi. from this survey, a register of OAEs and OACs must also be generated, containing, at least, the location, type and dimensions of each of the elements. This information must be entered in the SIR. This register must be updated when new devices are implemented;
- vii. at the end of the deadlines established for the surveys, a copy of the products must be made available to ARTESP in digital format, preferably through SISPROJ, from its implementation by the Concessionaire; and
- viii. at the end of each intervention carried out in the ROAD SYSTEM by the CONCESSIONAIRE, or when requested by ARTESP, the topographic surveys must be duly updated when preparing the as built documentation, according to the rules contained in APPENDIX G.

1.2.3.3 Registration survey of RIGHT-OF-WAY

The CONCESSIONAIRE shall carry out a research work with the responsible bodies (DER, notary offices, etc.) to obtain the supporting documentation of the updated registration of the limits of the RIGHT-OF-WAY and *non aedificandi* area. The information obtained in this research, as well as the digital copies of the pertinent documentation, must be registered in the SIR.

Additionally, the CONCESSIONAIRE will provide consolidated drawings in *dwg* format or equivalent, containing the updated registration, based on UTM coordinates (SIRGAS2000 base), as well as generating a kmz file or equivalent. Copies of these files must be made available in SISPROJ as of their implementation by the CONCESSIONAIRE.

1.2.3.4 Integrated Digital Model of the ROAD SYSTEM

Based on the surveys mentioned above and on the integration with the executive projects elaborated in BIM modeling, the CONCESSIONAIRE shall carry out a program aiming at the full restitution of the ROAD SYSTEM in BIM modeling, contemplating all the elements of the ROAD SYSTEM. At the end of this work, the integrated digital model of the ROAD SYSTEM (MDSR) will be generated. The information generated in the SPONSORED CONCESSION digital model must be manageable within SISGIS.

The MDSR will be designed based on BIM modeling/methodology concepts, in agreement with current standards and best practice manuals. Said model must contain segregation of elements that allows the management of the assets of the SPONSORED CONCESSION, as well as the management and visualization of the road registry and other elements of the ROAD SYSTEM. The level of development (LOD) of the model to be generated will depend on the level of information required by ARTESP for management purposes (network level) and will be defined by ARTESP's technical teams in a specific Ordinance.

The MDSR must be used, from its development, to manage the assets of the SPONSORED CONCESSION and integration with the other electronic management systems provided for in the SPONSORED CONCESSION, in particular SISGIS.

In order to fulfill this obligation, the CONCESSIONAIRE shall prepare and submit to ARTESP an action plan, containing a schedule of the phases of preparation and implementation of the program.

The schedule, covering the entire ROAD SYSTEM, must provide as a deadline for the beginning of the implementation of the program at the end of the second year from the START DATE OF OPERATION. It should also provide that all phases of program implementation are completed by the deadline defined in the item 5 of this ANNEX.

The MDSR to be developed during the implementation phases of the program must be updated and shared with ARTESP, at least every 6 (six) months, as well as comply with the technical specifications of current regulations and best practice guides.

Integration with other electronic management systems provided for in the SPONSORED CONCESSION, especially SISATIVOS, should also be foreseen.

With each completed work, the CONCESSIONAIRE must update the MDSR based on the models generated from the monitoring of the works (MBIM-AB and MBIM-COMP).

1.2.3.5 Hydrological and drainage study

Based on the topographic survey and the registration of OAEs and OACs, obtained under the terms of item 1.2.3.2, the CONCESSIONAIRE shall carry out a hydrological study of the entire ROAD SYSTEM to verify the adequacy of each of the registered devices to the norms and legislation in force, especially in what concerns maximum refers flows, time of recurrence of rains, maximum slopes and flow velocity.

This study must be updated with each new work implemented, together with the field cadastral surveys, and must be partially delivered to ARTESP every 6 (six) months, from the beginning of the SPONSORED CONCESSION, and the information must be duly registered in the CONCESSIONAIRE SIR system. The final delivery of the study must be carried out according to the deadline defined in item 5 of this ANNEX.

Through the hydrological study, and based on the topographic and land use and occupation surveys adjacent to the RIGHT-OF-WAY, the CONCESSIONAIRE shall carry out a study to identify critical areas for the occurrence of surface dynamics processes (erosions, gullies, silting, etc.) such as commercial establishments, plantations, crops, residences, fishing grounds, lakes, streams and other susceptible occupations due to the high concentration of rainwater runoff from the RIGHT-OF-WAY, with emphasis on stretches of high slope and extensive contribution basin.

For these areas, provision should be made for the implementation of drainage devices with adequate capacity for the volume and intensity of the flow, aiming at the control and dissipation of energy, such as: damping basins or other typologies, as well as devices for retention and/or accumulation of rainwater that allows for gradual drainage, reducing the impact on neighboring properties.

1.2.3.6 Additional areas

If the need for additional areas outside the RIGHT-OF-WAY is identified, due to space restrictions or unfavorable topographical conditions for implementation within the RIGHT-OF-WAY, the CONCESSIONAIRE shall forward to ARTESP studies, documents and justifications capable of supporting the process of expropriation. Once the expropriation is carried out, the CONCESSIONAIRE shall update the topographic survey of the limits of the new RIGHT-OF-WAY.

The conclusive study of the need to adapt the drainage elements must be submitted for analysis by ARTESP and must include a proposal for a schedule for the adaptation of the elements, in which the CONCESSIONAIRE must prioritize the places that present the greatest risk to the safety of USERS.

If the conclusive study indicates the proven insufficiency of the drainage elements of the ROAD SYSTEM, the works that may be necessary, as well as the expropriations and other encumbrances arising therefrom, for the adequacy of the drainage system will be object of economic and financial rebalancing, under the terms of the AGREEMENT, except in the event of faults and/or defects in the construction and maintenance design, both cases under the responsibility of the CONCESSIONAIRE, or arising from other risks attributed to it.

After verifying the relevance of the identified needs and the presented schedule, the inclusion of investments will follow the rules foreseen for the ORDINARY REVIEW, being essential the preparation of the respective project and budget.

1.2.4. Conservation / maintenance standards

The pre-set conservation/maintenance standards establish performance and quality criteria for the services, as they define the aspect or function that the ROAD SYSTEM must present as a result of these works. These standards are understood as guidelines for the team involved in the SPONSORED CONCESSION, in addition to establishing budget values for the ROAD SYSTEM.

The setting of conservation/maintenance standards can be affected by numerous variables, such as type or class of the road and its surroundings, topography, soil, weather conditions, volume and type of traffic, age of pavement and structures, geometric designs, signage, security elements, road restraint device, etc.

The conservation/maintenance standards can be established in several ways: by a numerical value, by a description, or by a determination of the frequency in which services are performed, among other criteria.

The standards of conservation/maintenance services in the execution of the CONCESSIONAIRE works must respect, at least, the conditions below:

- i. the road conservation/maintenance services must be performed, having as reference specifications, current regulations, procedures existing at the time of the performance of the services and/or others that may be approved, modified or adopted by ARTESP at the time of the performance of the services;
- ii. in the event that the objects of the services do not have ARTESP's specifications, the norms edited by ABNT will prevail and, in the absence of these, the indications of ARTESP will prevail in the light of the applicable international norms; and
- iii. the conservation/maintenance standards indicated in this item will apply to all elements and devices located within the limits of the RIGHT-OF-WAY, including side roads, device loops, bike paths and others.

To ensure the established conservation standards, the CONCESSIONAIRE must implement a process to identify anomalies in the ROAD SYSTEM, so that the standards do not fall below the minimum required.

This process must be presented to ARTESP within the period provided for in this ANNEX and must obtain the ISO 9001 certificate within 1 (one) year after its implementation.

1.2.5. Annual Work Program

In order to comply with the routine conservation/maintenance standards established in this ANNEX, the CONCESSIONAIRE shall prepare and submit to ARTESP an annual work program that shall observe the structure established in this chapter. The information contained in the Annual Work Schedule shall be based on the General Worksheet of Works and Services, which includes Lot, Road, Service Code,

Service Breakdown, Section, Direction, Date, Time, Prohibited Lanes and Responsible for execution.

Said program includes the preparation of computerized reports by the CONCESSIONAIRE for analysis of efficiency and costs at various management levels, without prejudice to the updated availability of all information and data specified in this ANNEX, which must be done through digital management systems for the functions of conservation, so that ARTESP can monitor the routine conservation/maintenance services performed by the CONCESSIONAIRE. The delivery of reports on services performed to ARTESP will be monthly and/or annual, depending on what is established in this ANNEX.

1.3. Structuring the programs

In order to organize and facilitate the routine maintenance/upkeep of the ROAD SYSTEM, the programs and sub-programs were subdivided, namely:

- a. Pavement
 - a.1. Flexible Pavement;
 - a.2. Rigid Pavement.
- b. Right-of-way
 - b.1. Conservation of the vegetation cover;
 - b.2. Cleaning;
 - b.3. Erosion;
 - b.4. Monuments and public utilities;
 - b.5. Graffiti;
 - b.6. Lateral conformation;
 - b.7. Vedos – fences, walls, fences and screens.
- c. Drainage
 - c.1. Platform surface drainage;
 - c.2. Surface drainage outside the platform;
 - c.3. Manholes, galleries and drains;
 - c.4. Pickup boxes;
 - c.5. Tunnel drainage;

- c.6. Fauna crossings;
- c.7. Retaining and leaking boxes;
- c.8. Drainage ditches.
- d. Road restraint device
 - d.1. Flexible devices (metal fenders, cable fenders and the like);
 - d.2. Rigid devices (concrete barriers and similar);
 - d.3. Anti-glare devices;
 - d.4. Guard rail and balusters.
- e. Signaling and Auxiliary Devices
 - e.1. Horizontal signs;
 - e.2. Vertical signs;
 - e.3. Delimiting Devices;
 - e.4. Plumbing device;
 - e.5. Alert signaling devices;
 - e.6. Temporary use device;
 - e.7. Traffic light signs.
- f. Structures
 - f.1. Bridges, viaducts, tunnels and pedestrian flyover.
- g. Operational and Support Buildings and Yards – (each operational or support building or yard represents a specific sub-program).
- h. Collection Control System
 - h.1. Collection system.
- i. Traffic and transport inspection control system and support for non-delegated services
 - i.1. General Inspection Station (PGF);
 - i.2. Speed Control System;

i.3. System to Read and Decode Vehicle License Plates (OCR).

j. User Relationship and Communication System

j.1. Radiophony System;

j.2. Customer Service System 0800

j.3. Data Communication System;

j.4. Operational Control Center;

j.5. Emergency telephone-type communication system with the User (call box);

j.6. Communication system with Users via wireless data network;

j.7. System of Variable Message Boards (PMVs);

j.8. Ombudsman and Other Channels of Connection with Users.

k. Traffic Monitoring System

k.1. Traffic sensing system;

k.2. Traffic Monitoring System via CFTV.

l. Lighting

l.1. Iluminação viária;

l.2. Building lighting;

l.3. Light signage.

m. Electrification

m.1. High voltage lines;

m.2. Low voltage lines;

m.3. Substations and primary cabins;

m.4. Motogenerators;

m.5. No-break systems.

1.4. Description and Standards for the Programs

Failure to comply with the activities provided for in this item will subject the CONCESSIONAIRE to the rules established by ANNEX 03 and to the application of the administrative sanctions provided for in ANNEX 11. The deadlines for correction/regularization of non-conformities found must be counted in consecutive days/hours and will start at the time of verification by ARTESP's inspection.

a. Pavement

Description

This program comprises the lanes, shoulders and shelters of highways and their intersections, as well as other paved surfaces, including access to buildings that are part of the highways, patios, surroundings of operational buildings, support buildings, public utilities, junction devices and marginal roads to the limits of the RIGHT-OF-WAY.

Standards

a.1. Flexible Pavement;

- a.1.1. pot, hole or detachment: temporary emergency repair within a maximum of 24 (twenty-four) hours;
- a.1.2. definitive repair with clipping: execution in a maximum of 1 (one) month;
- a.1.3. depression in the encounter of a work of art: repair in a maximum of 2 (two) weeks;
- a.1.4. small depression or settlement: repair in a maximum of 1 (one) month;
- a.1.5. compromised rolling surface when a section, in the same lane, shoulder or refuge, presents surface wear, cracks in blocks (longitudinal, transversal or caused by fatigue - "alligator leather"), wheel track sinking, pumping of fines, lateral slippage, exudation, damaged or poorly executed patches, undulation or corrugation: replacement of the carriageway, shoulder and/or shelter in its full widths, respecting the same type of coating of the final layer used in the last special conservation intervention of the pavement carried out, even if not by the CONCESSIONAIRE, in a maximum of 1 (one) month;
- a.1.6. rolling surface moderately compromised when any stretch of 100 (one hundred) continuous meters in length presents 3 (three) or more repairs (temporary or definitive) on the pavement in the same carriageway, shoulder or refuge: replacement of the carriageway, shoulder or refuge, transversally in its total widths and longitudinally from the first to the last repair, restoring the original conditions of the executive project of the last special conservation intervention of the pavement carried out, even if not by the CONCESSIONAIRE, in a maximum of 1 (one) month. When the repair is located between two lanes, between the lane and the shoulder, or between the lane and the refuge, it will be accounted for both sides, which must be regularized;

a.1.7. crack sealing: programmable for execution at least once a year; and

a.1.8. step between runway and shoulder (paved or not): repair in a maximum of 1 (one) month.

a.2. Rigid Pavement

a.2.1. pots or holes in the roadway: temporary emergency repair within a maximum of 24 (twenty-four) hours;

a.2.2. definitive repair with clipping: execution in a maximum of 1 (one) month;

a.2.3. depression in the encounter of a work of art: repair in a maximum of 2 (two) weeks;

a.2.4. construction joints and cracks: programmable cleaning and resealing for execution, at least once a year;

a.2.5. broken edges or slabs: temporary emergency repair in a maximum of 24 (twenty-four) hours and definitive repair with a cut in a maximum of 1 (one) month.

b. Right-of-way

Description

This program comprises the services of manual and mechanized pruning of the vegetation covering, cleaning and sweeping of the platform of the roads, removal of common and construction and demolition (RCD) waste from the RIGHT-OF-WAY, cleaning of paved central bed, erosion correction, conservation of monuments.

The material resulting from the pruning of the vegetal covering and the cleaning must be collected to a predetermined place that does not affect the drainage system of the road and natural drainages, as well as does not cause a bad appearance to the USER.

The cleaning and/or sweeping of platforms and paved areas must be carried out on the lanes, shoulders and shelters.

In the surroundings of the PMRv scales and stations, this service should be intensified due to the high passage of vehicles and pedestrian circulation.

Residues, debris or plant remains existing within the limit of the RIGHT-OF-WAY of the road and at its intersections must be removed, transported and sent to a suitable location, as established in the legislation in force.

Dead animals must be removed from the RIGHT-OF-WAY and disposed of according to the decision of the CETESB board No. 141/2018/I, of 08/14/2018, or legislation in force that may

change or replace it.

Cleaning the paved median includes sweeping and eradicating all existing vegetation.

Monuments must be cleaned and/or painted, with the corresponding coverings, if any, checked and repaired. The areas within the limits of the RIGHT-OF-WAY, with the exception of the road platform, other paved areas and areas with rocky outcrops and altered rocks, must have flawless vegetation covering, including cut or fill slopes, as well as must remain clean and equipped with drainage system. Places with poor soils should be subject to the application of appropriate techniques, including fertilization and specific corrections, and technologies available on the market for these situations, in order to allow the adequate development of the vegetation cover.

Standards

b.1. Conservation of the vegetation cover

The manual and/or mechanized pruning services of the vegetation covering, which include the services of trimming and removal of the mass resulting from the pruning, must be performed along the entire length of the grassy central beds and along the entire length of the roads at least 4 m (four meters) counted from the outer edge of the shoulder or from the drainage element (whichever is outermost), even in sloping regions (sloping, for example, on slopes).

On all interchanges, devices (including roundabouts and loops), side roads, level intersections, buildings and operational and support yards, monuments and rest areas, manual and mechanized pruning of the vegetation covering must be carried out up to the limit of the RIGHT-OF-WAY.

- b.1.1. manual or mechanized pruning of vegetation cover: when the height of the vegetation reaches 30 (thirty) centimeters in any place within the limits of the RIGHT-OF-WAY or, 10 (ten) centimeters in the surroundings of operational, support facilities and surroundings of monuments and obelisks;
- b.1.2. weeding: programmable execution for at least 4 (four) times a year;
- b.1.3. mass resulting from pruning: removal in a maximum of 48 (forty-eight) hours;
- b.1.4. refining: execution in a maximum of 1 (one) week;
- b.1.5. firebreaks: conservation of firebreaks comprising mowing and/or weeding, with a width of 1.5 m (one and a half meters) along the entire length of the boundaries of the RIGHT-OF-WAY, programmable for at least 1 (one) time a year, and must this activity must be completed by June 30 of each year;
- b.1.6. depraguetment: programmable execution for at least 2 (two) times a year in grassy areas around buildings, monuments and obelisks courtyards;

- b.1.7. maintenance of trees and shrubs: fertilization, protection, crowning and placement of mulch, programmable for at least 1 (one) time a year;
- b.1.8. cutting and pruning of trees and bushes: dead or cursed trees and bushes must be cut and removed outside the RIGHT-OF-WAY within a maximum of 1 (one) month;
- b.1.9. cutting and pruning of trees and shrubs that represent a danger to road safety, whose roots compromise the drainage system or obstruct the visibility of the signs: they must be cut and removed outside the RIGHT-OF-WAY, or pruned (if applicable), in 24 (twenty-four) hours at most;

In the event of a situation of suppression restricted by current legislation, the relevant authorizations must be obtained within the period stipulated by the competent body. When suppression is not authorized, tree individuals must be protected by road containment devices.

Situations that pose a danger to road safety are considered:

- i) exposed trees, that is, within the free zone and without a road restraint device between them and the runway;
 - ii) dead or cursed trees and bushes with branches outside the limit of the vertical projection of the outer edge of the shoulder or shelter, within the radius of an eventual fall; and
 - iii) trees and shrubs with branches within the vertical projection of the carriageway, shoulder, shelters, device handles and marginal roads, at any height and branches that may hamper or prevent the visualization of vertical signaling from a safe distance.
- b.1.10. recovery of the vegetation covering the entire ROAD SYSTEM, with the exception of paved areas and areas with rocky outcrops and altered rocks, including replacements in places with failures within a maximum of 1 (one) month.

When it is not possible to perform the vegetal covering, the CONCESSIONAIRE must prove the situation through a Technical Report signed by a duly qualified professional. In places where there are proven conditions for there to be no vegetation covering (through a report issued by a qualified professional), adequate geotechnical treatment must be applied within a maximum of 1 (one) month so that the site is protected against erosion, in order to meet to the provisions of items “d” and “e” of section 7.3.1 of NBR 11,682 or any other that may replace or change it. In this case, the CONCESSIONAIRE must present a report and project prepared by a geotechnician, and, if necessary, it must have the support of a qualified professional (e.g., agronomist) to justify the need for the proposed solutions and treatments.

b.2. Clearing

Waste from cleaning services must be disposed of in suitable locations.

- b.2.1. solid waste from operational and support facilities: removal at least once a day, with selective collection and priority destination being recommended for recycling programs;
- b.2.2. solid waste, debris or plant remains (e.g., branch, trunk, etc.) within the limits of the RIGHT-OF-WAY: removal in a maximum of 01 (one) week, including the entire length of highways and return and access devices , with priority destination for recycling programs;
- b.2.3. cleaning and sweeping of paved areas subject to deposition of debris: execution in a maximum of 1 (one) week, including the eradication of all existing vegetation (for example, on the basis of a concrete barrier, wall, etc.);
- b.2.4. cleaning of paved central bed: execution in a maximum of 1 (one) week, including the eradication of all existing vegetation;
- b.2.5. dead animals inside the lanes: removal in a maximum of 90 (ninety) minutes. The procedures for the final disposal of the carcasses must comply with the DD.141/2018/I, of 08/14/2018, of CETESB and/or legislation in force that may complement or replace;
- b.2.6. dead animals within the limits of the RIGHT-OF-WAY, but outside the lanes: removal in a maximum of 12 (twelve) hours. The procedures for the final disposal of the carcasses must comply with the DD.141/2018/I, of 08/14/2018, of CETESB and/or legislation in force that may complement or replace; and
- b.2.7. cleaning of canals and rivers: programmable execution for at least 1 (one) time a year, and this activity must be completed by October 31 of each year.

b.3. Cut or fill erosions

- b.3.1. emergency services: cleaning the platform, removing eroded material, protecting the slope, diverting water and signaling within a maximum of 24 (twenty-four) hours;
- b.3.2. definitive correction or restoration, including drainage and vegetation cover: within a period proposed by the CONCESSIONAIRE, defined according to the magnitude or volume to be repaired and duly justified, to be approved by ARTESP.

b.4. Monuments and public utilities

- b.4.1 monuments and public utilities that are damaged, damaged or in poor condition: correction / regularization within a maximum of 15 (fifteen) days. Longer periods may be accepted when technically necessary depending on the magnitude or volume to be repaired, provided they are duly justified.

b.5. Graffiti

b.5.1 Graffiti on monuments and other places in the RIGHT-OF-WAY, with the exception of graffiti on vertical signs, removed within a maximum of 1 (one) week.

b.6. Lateral conformation

b.6.1 step removal and land regularization in the RIGHT-OF-WAY (lower level land) along the side of the paved or unpaved shoulder, or between the shelter of the rolling lane and the central bed or on the side of the cloverleaf loops, devices and accesses: correction / regularization in a maximum of 1 (one) month. Maximum allowed height difference of 1 (one) centimeter.

b.7. Vedos (walls, fences, fences and screens)

The CONCESSIONAIRE must analyze the ROAD SYSTEM throughout the entire period of the SPONSORED CONCESSION in order to identify points that, due to urbanization, need modification or complementation of the type of fence from welded to wall, in a way that completely inhibits the entrance of pedestrians in the right-of-way.

The CONCESSIONAIRE throughout the TERM OF THE CONCESSION must monitor the OAEs of the ROAD SYSTEM, and in places where actions of throwing objects on the highway are identified, causing the insecurity of USERS, it must proceed with the installation of screens in the OAEs.

The conservation of fences, walls, fences and screens (at the limit of the RIGHT-OF-WAY, on pedestrian flyover or under them, along the central bed, etc.) includes the replacement of posts, supports, wires and other elements that constitute these types of fences, and that are damaged, deteriorated, in the process of corrosion or at the end of their useful life.

b.7.1 Damaged, missing, worn or damaged items: repair or replacement within a maximum of 1 (one) week.

c. Drainage

Description

This program comprises the services of clearing and cleaning the entire surface drainage system existing on the platform and outside the platform of the highways, as well as intersections, etc.

The drainage system is fundamentally composed of gutters, channels, passage boxes, storm drains, platform and deep culverts, galleries, sub-horizontal drains, etc.

This service also includes the replacement of grids and caps for collection boxes.

Standards

- c.1. Platform surface drainage (considering the space between the cut toe and the embankment crest, inclusive, regardless of the distance between the drainage element and the carriageway)
 - c.1.1. general cleaning: programmable for at least 4 (four) times a year;
 - c.1.2. damaged or damaged drainage elements: repair or replacement within a maximum of 1 (one) month;
 - c.1.3. lateral conformation: whenever the unpaved lateral segment exceeds the height of the shoulder or the central refuge: correction / regularization in a maximum of 1 (one) month; and
 - c.1.4. totally or partially clogged drain element: unclogging in a maximum of 1 (one) week, regardless of the general cleaning schedule. Partial obstruction of the drainage element is considered when the OAC does not allow the total continuous flow of the flow in the downstream direction, that is, when the OAC does not have 100% of the cross-sectional area unobstructed.
- c.2. Surface drainage outside the platform (considering the spaces outside the crest of the embankment or at the foot of the cut, exclusive)
 - c.2.1. cleaning for the system in general, programmable for at least 1 (one) time a year, and this activity must be completed by October 31 of each year;
 - c.2.2. damaged or damaged drainage element: repair or replacement within a maximum of 1 (one) month; and
 - c.2.3. totally or partially clogged drainage element: clearing in a maximum of 1 (one) week.
- c.3. Manholes, galleries and drains
 - c.3.1. general cleaning: programmable for at least 1 (one) time a year, and this activity must be completed by October 31 of each year; and
 - c.3.2. damaged or damaged drainage element: repair or replacement within a maximum of 1 (one) month; and
 - c.3.3. totally or partially clogged drain element: unclogging in a maximum of 1 (one) week, regardless of the general cleaning schedule.
- c.4. Pickup boxes
 - c.4.1. general cleaning: programmable for at least 1 (one) time every 3 (three) months;

- c.4.2. damaged or damaged drainage element: repair or replacement within a maximum of 1 (one) month;
- c.4.3. totally or partially clogged drain element: unclogging in a maximum of 1 (one) week, regardless of the general cleaning schedule.
- c.5. Tunnel drainage
 - c.5.1. general cleaning: programmable for at least every 3 (three) months;
 - c.5.2. occurrence of water on the runway inside the tunnel: carry out the repairs and adjustments, in order to eliminate the conditions that allowed it, within a maximum of 1 (one) month;
 - c.5.3. totally or partially clogged drain element: unclogging in a maximum of 1 (one) week, regardless of the general cleaning schedule.
- c.6. Fauna crossings
 - c.6.1. general cleaning: programmable for at least 2 (two) times a year at the beginning and end of the rainy season;
 - c.6.2. vegetation management in the dry part of the programmable passage for at least 4 (four) times a year;
 - c.6.3. totally or partially clogged drain element: unclogging in a maximum of 1 (one) week, regardless of the general cleaning schedule.
- c.7. Leak containment boxes
 - c.7.1. general cleaning: programmable for at least 4 (four) times a year;
 - c.7.2. Inspection: programmable for at least 1 (one) time per month;
 - c.7.3. general cleaning: immediately after any leakage;
 - c.7.4. transport of leaked materials to a qualified and duly licensed destination: immediately after any leak; and
 - c.7.5. totally or partially clogged drain element: unclogging in a maximum of 1 (one) week, regardless of the general cleaning schedule.

d. Road restraint device

Description

Traffic restraint devices are used to contain and redirect uncontrolled vehicles when they leave the roadway, so as not to hit fixed objects or reach dangerous areas along their route.

A risk to the USER's safety is defined as any situation in which faulty/damaged devices, at the end of their useful life or compromised by corrosion and misaligned, do not guarantee efficient operation in the event of a shock. The criteria are based on the functionality described in manufacturing standards and/or manuals.

Standards

d.1. Flexible devices (metal fenders, cable fenders and the like, shock absorbers/attenuators, absorbing terminals, transitions, connections, etc.)

d.1.1. the CONCESSIONAIRE shall carry out the adaptation of the pre-existing flexible road containment devices in the ROAD SYSTEM, in order to meet the criteria and guidelines established in the technical standards of ABNT and other relevant standards (manuals, specifications and project instructions), in force at the time of the intervention.

In places where the CONCESSIONAIRE concludes that the best adjustment solution is the complementation (extension) of the road containment device, the implementation of this device segment must occur in order to meet the deadline stipulated in this item.

Containment devices must have a very high containment level, according to the specifications in ANNEX 07.

The necessary adjustments to meet this item must be included in the executive project provided for in ANNEX 07 and completed before the start of the operation.

At the end of the implementation services, the CONCESSIONAIRE must present a photographic report that proves the execution of the services.

d.1.2. the CONCESSIONAIRE shall, annually or at the request of ARTESP, throughout the CONCESSION TERM, analyze the ROAD SYSTEM to identify points that, due to any changes (interventions, VDM, incidence of accidents), no longer have the need for the existing device or need flexible-type road restraint devices to meet the criteria and guidelines established in the ABNT technical standards and other relevant standards in force at the time. Containment devices must have a very high containment level, according to the specifications in ANNEX 07.

For these cases, the CONCESSIONAIRE, at its own expense, must carry out the intervention (removal, relocation, adaptation or implantation) in the devices, taking into account the parameters established in the aforementioned standards, observing the useful life of the element and the provisions of Clause Sixteen of the AGREEMENT. If there is a need to implement new devices, the CONCESSIONAIRE, at its own expense, must execute it within 1 (one) week after the finding and be included in the ISR report, pursuant to ANNEX 05. The CONCESSIONAIRE shall forward to ARTESP, within a maximum period of 3

(three) days from the conclusion of the intervention, the update of the registration of road containment devices;

- d.1.3. damaged/damaged devices, at the end of their useful life or compromised by corrosion and misaligned, which pose a risk to the USER's safety: immediate signaling with cones, easels and tapes. Removal, repair and/or replacement and/or replacement and/or realignment, in compliance with the regulations in force at the time of the intervention, within a maximum of 24 (twenty-four) hours;
- d.1.4. damaged/damaged devices, at the end of their useful life or compromised by corrosion and misaligned, which do not represent a risk to the USER's safety: removal, repair and/or replacement and/or realignment, complying with the regulations in force at the time of the intervention, in, at maximum, 1 (one) week;
- d.1.5. cleaning, washing or painting: programmable for at least 1 (one) time every 2 (two) years. If there is a state of dirt that impairs the visibility of the elements, the cleaning must be carried out within a maximum period of 1 (one) week;
- d.1.6. The CONCESSIONAIRE shall provide ARTESP with a digital file containing the schedule of the service to be performed in the following year, by means of a document filed between the 1st and the 10th of November of each year. Performance of the services defined in the annual program must be confirmed through monthly programs, providing details by week and day, which must be registered by ARTESP in the form of a printed copy and a digital file between the 1st and 10th of the month preceding each month of services.

d.2. Rigid devices (concrete barriers and similar)

- d.2.1. the CONCESSIONAIRE shall carry out the adaptation of the pre-existing rigid road containment devices in the ROAD SYSTEM, in order to meet the criteria and guidelines established in the technical standards of ABNT and other relevant standards in force at the time of the intervention.

In places where the CONCESSIONAIRE concludes that the best adjustment solution is the complementation (extension) of the road containment device, the implementation of this device segment must occur in order to meet the deadline stipulated in this item.

The necessary adjustments to meet this item must be included in the EXECUTIVE PROJECT provided for in ANNEX 07 and completed before the start of the operation;

- d.2.2. At the end of the implementation services, the CONCESSIONAIRE must present a photographic report that proves the execution of the services.

The CONCESSIONAIRE shall, annually or at the request of ARTESP, throughout the CONCESSION TERM, analyze the ROAD SYSTEM in order to identify points that, due to any changes (interventions, VDM, incidence of

accidents) no longer need the existing device or they start to need rigid-type road restraint devices, in order to maintain compliance with the criteria and guidelines established in the ABNT technical standards and other relevant standards in force at the time. The CONCESSIONAIRE must pay attention to corrections that may be necessary due to surface drainage problems.

For these cases, the CONCESSIONAIRE, at its own expense, must carry out the intervention (removal, relocation, adaptation or implantation) in the devices, taking into account the parameters established in the aforementioned standards, observing the useful life of the element and the provisions of Clause Sixteen of the AGREEMENT. If there is a need to implement new devices, the CONCESSIONAIRE, at its own expense, must execute it within 1 (one) week after the finding and be included in the ISR report, pursuant to ANNEX 05. The CONCESSIONAIRE shall forward to ARTESP, within a maximum period of 3 (three) days from the conclusion of the intervention, the update of the registration of road containment devices;

- d.2.3. damaged device that poses a risk to the USER's safety: immediate signaling with cones, easels and tapes. Removal and replacement by a temporary barrier, with a compatible containment level, within a maximum of 24 (twenty-four) hours and restoration, in compliance with the regulations in force at the time of the intervention, within a maximum of 1 (one) week;
- d.2.4. damaged device that does not pose a risk to the USER's safety: repair or replacement, in compliance with the regulations in force at the time of the intervention, within a maximum of 1 (one) week; and
- d.2.5. cleaning, washing or painting: programmable for at least 2 (two) times a year. The CONCESSIONAIRE shall provide ARTESP with a digital file, by means of a document filed between the 1st and the 10th of November of each year, containing the schedule of the service to be performed in the following year. The execution of the services presented in the annual schedule must be confirmed through a monthly schedule, detailed by weeks and days, to be filed with ARTESP, in a digital file, between the 1st and the 10th of the months that precede the months of execution.

d.3. Anti-glare devices

- d.3.1. The CONCESSIONAIRE shall, annually or at the request of ARTESP, throughout the CONCESSION TERM, analyze the ROAD SYSTEM in order to identify points that, due to any changes (interventions, VDM, incidence of accidents) may require anti-glare devices.

In these cases, the CONCESSIONAIRE must carry out the intervention, meeting the parameters established in the rules and specifications in force at the time of the intervention. If there is a need to implement new devices, the CONCESSIONAIRE, at its own expense, must execute it within 1 (one) week after the finding and be included in the ISR report, pursuant to ANNEX 05. The

CONCESSIONAIRE shall forward to ARTESP, within a maximum period of 3 (three) days, counting from the conclusion, the registration update;

- d.3.2. damaged/broken and/or deteriorated and/or absent and/or damaged and/or misaligned device that poses a risk to the USER's safety: immediate signaling with cones, easels and tapes. Removal within a maximum of 24 (twenty-four) hours and replacement and/or replacement and/or realignment, in compliance with the rules and specifications in force at the time of the intervention, within a maximum of 1 (one) week;
- d.3.3. damaged/damaged and/or deteriorated and/or absent and/or damaged and/or misaligned device that does not pose a risk to the USER's safety: repair and/or replacement and/or realignment, meeting the rules and specifications in force at the time of the intervention, in a maximum of 1 (one) week; and
- d.3.4. cleaning, washing or painting: programmable for at least 2 (two) times a year, and cleaning can be requested by ARTESP at any time, if necessary. The CONCESSIONAIRE shall provide ARTESP with a digital file, by means of a document filed between the 1st and the 10th of November of each year, containing the schedule of the service to be performed in the following year. Performance of the services defined in the annual program must be confirmed through monthly programs, providing details by week and day, which must be registered by ARTESP in the form of a printed copy and a digital file between the 1st and 10th of the month preceding each month of services. The execution of the services performed must also be launched in SIGECOM with evidence of the completion of the services and integration with MITS.

d.4. Guard rail and balusters.

- d.4.1. damaged device that poses a risk to the USER's safety: immediate signaling with cones, easels and tapes. Removal within a maximum of 24 (twenty-four) hours and repositioning, in compliance with the rules and specifications in force at the time of the intervention, within a maximum of 1 (one) week;
- d.4.2. damaged device that does not pose a risk to the USER's safety: repair or replacement, complying with the rules and specifications in force at the time of the intervention, within a maximum of 1 (one) week; and
- d.4.3. cleaning, washing or painting: programmable for at least 2 (two) times a year. The CONCESSIONAIRE shall provide ARTESP with a digital file, by means of a document filed between the 1st and the 10th of November of each year, containing the schedule of the service to be performed in the following year. Performance of the services defined in the annual program must be confirmed through monthly programs, providing details by week and day, which must be registered by ARTESP in the form of a printed copy and a digital file between the 1st and 10th of the month preceding each month of services.

e. Signaling and Auxiliary Devices

Description

Highway signage includes a set of elements implemented in highways with the purpose of regulating, warning, indicating and educating users regarding the forms of using the road, as well as providing institutional information and contributing to the comfort and safety of drivers and highway workers.

The elements comprise horizontal and vertical signaling (regulation, warning, educational, indicative, institutional and services), temporary devices, channeling devices, delimiting devices, traffic light signaling systems and other elements provided for in the Brazilian Traffic Code (CTB), in the technical specifications issued by ARTESP, DER/SP and CONTRAN signaling manuals.

The standards defined in this item must be met throughout the ROAD SYSTEM (highways, side roads, access roads, devices, loops, stretches under construction, etc.) DER/SP, the Brazilian Traffic Code – CTB, technical standards and specifications in force at the time of the intervention.

Standards

e.1. Horizontal signs

- e.1.1. cleaning: the stretches of horizontal signage subject to the deposition of debris must be cleaned by means of mechanical sweeping, washing or application of a jet of compressed air or water. This procedure must be performed, at least, every 6 (six) months, or whenever the situation requires, for the efficiency and good visibility of the signal.

The CONCESSIONAIRE shall provide ARTESP with a digital file, by means of a document filed between the 1st and the 10th of November of each year, containing the schedule of the service to be performed in the following year. Performance of the services defined in the annual program must be confirmed through monthly programs, providing details by week and day, which must be registered by ARTESP in the form of a printed copy and a digital file between the 1st and 10th of the month preceding each month of services. The execution of the services performed must also be launched in SIGECOM with evidence of the completion of the services and integration with MITS.

The first schedule regarding the cleaning of the horizontal signage must be filed by the CONCESSIONAIRE within 30 (thirty) days after the OPERATION START DATE.

If there is a state of dirt that impairs the visibility of the horizontal signage, the cleaning must be carried out within a maximum period of 24 (twenty-four) hours;

- e.1.2. retro-reflectance: the CONCESSIONAIRE shall permanently maintain the retro-reflectance of all horizontal signage within the parameters established below:

Highway Limit	Speed	Minimum Retroreflection Index	Paint color
≤ 80 km/h		120 mcd/lux.m ²	white and yellow
> 80 km/h		150 mcd/lux.m ²	Yellow
		180 mcd/lux.m ²	White

The minimum retro-reflection indices for sections of a highway with reduced speed limits must be defined based on the highest speed limit established for any section of that highway.

The retroreflectance assessment must be carried out using manual or dynamic measuring equipment, using a retroreflectometer with calibration attested by a competent body, in agreement with the technical specifications and procedures established by ARTESP and, in their absence, in accordance with the ABNT technical standards NBR 14723 and NBR 16410 or others that may replace or change them, in force at the time of measurement. In the case of using dynamic measuring equipment, points with retro-reflectance below the minimum value must be confirmed using manual measuring equipment.

To verify the quality standards and plan the maintenance of the horizontal signage, the CONCESSIONAIRE shall evaluate the retro-reflectance of all horizontal signage (longitudinal lines, channel marks, transversal marks and inscriptions on the pavement) throughout the ROAD SYSTEM by an individual or legal entity with proven expertise in this type of service.

The regular measurement service of the retroreflectance indices of horizontal signage cannot be carried out at intervals of less than 6 (six) months between one measurement and another. Due to the forecast increase in the volume of traffic, this service cannot be performed in the months of January, July and December.

After the 3rd year of the OPERATION START DATE, the Concessionaire must guarantee the minimum retro-reflectance of the horizontal signaling. The CONCESSIONAIRE, to comply with this item, may:

- Within one year from the end of the 3rd year of the OPERATION START DATE, repaint up to 60% of the system;
- Within 5 (five) years from the end of the 3rd year of the OPERATION START DATE, repaint up to 80% of the system; and
- Within 7 (seven) years from the end of the 3rd year of the OPERATION START DATE, repaint up to 90% of the system

The percentages above refer to the entire track, including devices. The section with pavement intervention in which there was damage to the horizontal signaling will not be considered for the calculation and the recomposition of the horizontal signaling is mandatory. The percentages will be calculated separately for the longitudinal horizontal signaling (border lines, axis, etc.), per segment between consecutive kilometer marks and for road markings (zebrados, legends, etc.), per set.

The CONCESSIONAIRE shall provide ARTESP with a digital file, by means of a document filed between the 1st and the 10th of November of each year, containing the schedule of the service to be performed in the following year. Performance of the services defined in the annual program must be confirmed through monthly programs, providing details by week and day, which must be registered by ARTESP in the form of a printed copy and a digital file between the 1st and 10th of the month preceding each month of services. The execution of the services performed must also be launched in SIGECON with evidence of the completion of the services and integration with MITS.

The first schedule referring to the retroreflectance evaluation must be filed by the CONCESSIONAIRE within 30 (thirty) days after the OPERATION START DATE.

The measurement reports of the retroreflectance indexes of the horizontal signage must be prepared by the CONCESSIONAIRE, according to the models defined by ARTESP, and delivered, in digital copy, within 15 (fifteen) days from the date of the measurements.

ARTESP may also, when the inspection carried out requires such action, request, at any time, the evaluation of the retroreflectance index of the horizontal signaling in a specific section(s) to confirm its quality, being the CONCESSIONAIRE obligation, within the defined by ARTESP, evaluate and present the results, following the same procedures as regular measurements;

- e.1.3. painting or repainting: the painting or repainting service must be provided, within a maximum period of 1 (one) week, of a stretch or sub-stretch of horizontal signage in which a retroreflectance index lower than the limits established in this ANNEX is detected, or where the signage is indicated as inadequate to the technical specifications, standards, manuals and contractual requirements by the inspection of ARTESP. The CONCESSIONAIRE shall forward to ARTESP a retro-reflectance report of the revitalized signage proving the performance of the services.
- e.1.4. in stretches with pavement layer recovery work, after the intervention in the pavement layer, resurfacing or localized repair, the restoration of the horizontal signaling (painting or repainting) damaged by the work must be provided, even if on a provisional basis, before its total or partial release to traffic, in accordance with the provisions of article 88 of the CTB, CONTRAN's Brazilian Traffic Signaling Manual and DER/SP Road Signaling Manual. The definitive markings

must be implemented within a maximum period of thirty days after completion of works at the location in question.

In a stretch of highway where the pavement has been repaired at several nearby points (distance between them less than or equal to 100 (one hundred) meters, the recomposition of the horizontal signaling of the lanes (axis and edges) must be carried out in every stretch, continuously, and not just at each intervention point.

When the horizontal signage is recomposed, there should be no conflict between the new sign and the previous one. The erasing of horizontal signs, when necessary, must be carried out by appropriate equipment for mechanical removal or similar that preserves the structure of the pavement, being prohibited the use of paint or other product of similar performance to cover the sign. The inadequacies identified in the signage provided for in this item must be corrected within a maximum period of 24 (twenty-four) hours;

- e.1.5. in sections, released to traffic, where the absence or deficiency of horizontal signage is found, the CONCESSIONAIRE shall paint and/or repaint the signage within a maximum period of 24 (twenty-four) hours. Longitudinal lines will be evaluated separately from road markings.

e.2. Vertical signs

- e.2.1. cleaning: all vertical signage (ground and aerial) must be cleaned every 2 (two) months, by a duly trained team, using products, equipment and methods that guarantee its perfect state of cleanliness, without deteriorating the materials used in its manufacture (films and substrates), guaranteeing the perfect visibility and legibility of its messages daily, as established by the traffic legislation.

In stretches with a high level of dirt, cleaning should be done every 1 (one) month. If dirt compromises the legibility of the sign, cleaning must be carried out within a maximum period of 24 (twenty-four) hours.

The CONCESSIONAIRE shall provide ARTESP with a digital file, by means of a document filed between the 1st and the 10th of November of each year, containing the schedule of the service to be performed in the following year. Performance of the services defined in the annual program must be confirmed through monthly programs, providing details by week and day, which must be registered by ARTESP in the form of a printed copy and a digital file between the 1st and 10th of the month preceding each month of services.

The first schedule regarding the cleaning of vertical signs must be filed by the CONCESSIONAIRE within 30 (thirty) days after the OPERATION START DATE;

- e.2.2. retro-reflectance: the CONCESSIONAIRE shall permanently maintain the retro-reflectance of all vertical signage (aerial and ground) within the parameters

defined by ABNT's technical standards or similar technical specifications in force throughout the SPONSORED CONCESSION.

To verify the quality standards and plan the maintenance of vertical signage, the CONCESSIONAIRE shall annually assess the retroreflectance of all vertical signage (aerial and ground) throughout the ROAD SYSTEM, by an individual or legal entity with proven expertise in this type of service.

The retroreflectance evaluation must be carried out using retroreflectometer equipment with calibration not exceeding 1 (one) year, whose calibration certificate must be issued in Portuguese by a competent body. The service must be performed in agreement with the specifications and procedures established by ARTESP and, in their absence, in accordance with the technical standards ABNT NBR 14644 and NBR 15426 or others that may replace or change them and are in force at the time of the measurement.

The CONCESSIONAIRE shall provide ARTESP with a digital file, by means of a document filed between the 1st and the 10th of November of each year, containing the schedule of the service to be performed in the following year. Performance of the services defined in the annual program must be confirmed through monthly programs, providing details by week and day, which must be registered by ARTESP in the form of a printed copy and a digital file between the 1st and 10th of the month preceding each month of services. The execution of the services performed must also be launched in SIGECOM with evidence of the completion of the services and integration with MITS.

The first schedule referring to the retroreflectance evaluation must be filed by the CONCESSIONAIRE within 30 (thirty) days after the OPERATION START DATE.

The measurement reports of the retroreflectance indices of vertical signaling (aerial and ground) must be prepared by the CONCESSIONAIRE, according to models defined by ARTESP, and delivered within 15 (fifteen) days from the date of the measurements, in a digital copy.

ARTESP may also, when the inspection exercised requires such action, request, at any time, the evaluation of the retroreflectance index of the vertical sign(s) at specific point(s) to confirm its quality, being the CONCESSIONAIRE obligation, within the defined by ARTESP, evaluate and present the results following the same procedures as regular measurements;

- e.2.3. The regulatory and warning (aerial and ground) signaling boards must be adjusted, replaced, repositioned or replaced within a maximum period of 24 (twenty-four) hours whenever signaling is found to be in disagreement with manuals and/or standards and/or specifications, absence of signage, retro-reflectance lower than defined in the standard and/or specification, damage, wear, depredation or vandalism.

For signs replaced due to retro-reflectivity lower than that defined in the standard and/or specification, the CONCESSIONAIRE shall forward to ARTESP, within up to 3 (three) days immediately after the replacement, a retro-reflectance report of the revitalized sign proving the performance of the service;

- e.2.4. other signaling boards (aerial and ground) must be adequate, replaced, repositioned or replaced, within a maximum period of 1 (one) week, whenever inadequate signaling is found, in disagreement with manuals and/or standards and/or specifications, absence signaling, retro-reflectance lower than defined in the standard and/or specification, damage, wear, depredation or vandalism;
- e.2.5. For signs replaced due to retro-reflectivity lower than that defined in the standard and/or specification, the CONCESSIONAIRE shall forward to ARTESP, within up to 3 (three) days immediately after the replacement, a retro-reflectance report of the revitalized signage, thus proving the of the service;
- e.2.6. damaged gantries and semi-gantries that put the USERS of the highway at risk must be removed within 24 (twenty-four) hours and replaced within a maximum period of 30 (thirty) days. The signs contained therein must be provisionally installed on the ground, complying with the following maximum periods: 24 (twenty-four) hours for regulatory or warning signs and 1 (one) week for other types of signs;
- e.2.7. whenever necessary, in construction sites, inadequacies in vertical signage (ground and aerial), regarding cleaning, retro-reflectance, signage in disagreement with manuals and/or norms and/or specifications, absence of signage, wear, damage, depredation or vandalism must be overcome within a maximum period of 24 (twenty four) hours;
- e.2.8. in the sign where the absence of ARTESP registration and/or date of manufacture is verified, the availability of the information must be provided within a maximum of 1 (one) week;
- e.2.9. Vertical signs, hazard markers or alignment markers cannot be implanted in a paved area characterized as a track, including islands and fictitious beds, in paved areas, even if they are neutral areas. In case the presence of the aforementioned elements is verified, they must be removed within 24 (twenty-four) hours.

e.3. Delimiting Devices

- e.3.1. cleaning: the reflective tacks or studs must be cleaned quarterly, whenever necessary, using products, equipment and methods that guarantee their perfect state of cleanliness, without deteriorating the materials used in their manufacture, ensuring perfect visibility, as established traffic legislation.

In cases where dirt compromises the visibility and/or functionality of the devices, cleaning must be carried out within a maximum of 24 (twenty-four) hours. The

CONCESSIONAIRE shall provide ARTESP with a digital file, by means of a document filed between the 1st and the 10th of November of each year, containing the schedule of the service to be performed in the following year. Performance of the services defined in the annual program must be confirmed through monthly programs, providing details by week and day, which must be registered by ARTESP in the form of a printed copy and a digital file between the 1st and 10th of the month preceding each month of services.

The first schedule regarding the cleaning of vertical signs must be filed by the CONCESSIONAIRE within 30 (thirty) days after the OPERATION START DATE;

- e.3.2. cleaning: beacons, delineators and delimiter cylinders must be cleaned every 2 (two) months, using products, equipment and methods that guarantee their perfect state of cleanliness, without deteriorating the materials used in their manufacture, ensuring perfect visibility, as established by the traffic legislation.

In sections very prone to dirtying, cleaning must be done monthly. In cases where dirt compromises the visibility and/or functionality of the devices, cleaning should be carried out within a maximum of 24 (twenty-four) hours.

The CONCESSIONAIRE shall provide ARTESP with a digital file, by means of a document filed between the 1st and the 10th of November of each year, containing the schedule of the service to be performed in the following year. Performance of the services defined in the annual program must be confirmed through monthly programs, providing details by week and day, which must be registered by ARTESP in the form of a printed copy and a digital file between the 1st and 10th of the month preceding each month of services. The execution of the services performed must also be launched in SIGECON with evidence of the completion of the services and integration with MITS.

The first schedule regarding the cleaning of vertical signs must be filed by the CONCESSIONAIRE within 30 (thirty) days after the OPERATION START DATE.

- e.3.3. tacks and studs must be implanted, complemented or replaced, within a maximum period of 1 (one) week, whenever absence, retroreflectance lower than that defined in the standard and/or specification, wear, damage or sinking is found. The implementation, complementation or replacement must be carried out in agreement with the recommendations of the Brazilian Traffic Signaling Manual — CONTRAN, Road Signaling Manual — DER/SP and related technical standards or specifications.

In places where there is repair and/or restoration of a pavement layer with an extension of less than 1km (one kilometer), the tacks and/or reflective studs must be replaced and/or replaced within a maximum period of 30 (thirty) days from the conclusion of the service of each layer, with the liberation for the traffic.

For repairs and/or restoration of a pavement layer with a length of more than 1 km (one kilometer), the completion of the service will be considered per individual kilometer for counting the period for the replacement and/or replacement of the tacks and/or reflective studs within the period maximum of 30 (thirty) days from the conclusion of the service with the release to traffic.

At the discretion of ARTESP, at the expense of the Concessionaire, it may be requested the implementation, within 3 days after the release of traffic, of a solution that allows better visibility of the horizontal signaling, with a similar function to the retroreflective stripe, while the installation of the latter is not done, not exceeding the period of 30 days mentioned in the previous paragraph;

- e.3.4. beacons, delineators and delimiter cylinders must be implanted or replaced within a maximum period of 1 (one) week, whenever absence, retro-reflectance lower than that defined in the standard and/or specification, damage, wear or depredation is found. The implementation, complementation or replacement must be carried out in agreement with the recommendations of the Brazilian Traffic Signaling Manual — CONTRAN, Road Signaling Manual — DER/SP and related technical standards or specifications.

e.4. Plumbing device

- e.4.1. cleaning or painting: must be performed every 2 (two) months. In areas with a high level of dirt, cleaning or painting should be monthly, or whenever necessary to maintain the efficiency and/or good visibility of the devices. The CONCESSIONAIRE shall provide ARTESP with a digital file, by means of a document filed between the 1st and the 10th of November of each year, containing the schedule of the service to be performed in the following year. The execution of the services presented in the annual schedule must be confirmed through a monthly schedule, detailed by weeks and days, to be filed with ARTESP, in a digital file, between the 1st and the 10th of the months that precede the months of execution;
- e.4.2. The first cleaning schedule must be filed by the CONCESSIONAIRE within 30 (thirty) days after the deadline for completion of the IP. Replacement of damaged or non-existent devices must be provided within 1 (one) week. The complementation of channelizing devices must be done based on the recommendations of the Brazilian Traffic Signage Manual (Manual Brasileiro de Sinalização de Trânsito - CONTRAN) and DER/SP's Highway Signage Manual (Manual de Sinalização Rodoviária - DER/SP);
- e.4.3. Plumbing devices must be implanted, complemented or replaced, within a maximum period of 1 (one) week, whenever absence, wear, damage or sinking is found. The implementation, complementation or replacement must be carried out in agreement with the recommendations of the Brazilian Traffic Signaling Manual — CONTRAN, Road Signaling Manual — DER/SP and related technical standards or specifications.

e.5. Alert signaling devices

- e.5.1. cleaning: the warning signaling devices must be cleaned monthly, by a duly trained team, using products, equipment and methods that guarantee their perfect state of cleanliness, without deteriorating the materials used in their manufacture (films and substrates), guaranteeing the perfect visibility and legibility of your messages daily, as established by the traffic legislation.

In cases where dirt compromises the visibility and/or functionality of the devices, cleaning should be carried out within a maximum of 24 (twenty-four) hours.

The CONCESSIONAIRE shall provide ARTESP with a digital file, by means of a document filed between the 1st and the 10th of November of each year, containing the schedule of the service to be performed in the following year. The execution of the services presented in the annual schedule must be confirmed through a monthly schedule, detailed by weeks and days, to be filed with ARTESP, in a digital file, between the 1st and the 10th of the months that precede the months of execution. The execution of the services performed must also be launched in SIGECON with evidence of the completion of the services and integration with MITS.

The first schedule regarding the cleaning of vertical signs must be filed by the CONCESSIONAIRE within 30 (thirty) days after the OPERATION START DATE;

- e.5.2. retro-reflectance: the CONCESSIONAIRE shall permanently maintain the retro-reflectance within the parameters defined by ABNT's technical standards or similar technical specifications in force throughout the SPONSORED CONCESSION.

To verify the quality standards and plan the maintenance of the warning signaling devices, the CONCESSIONAIRE shall annually evaluate the retroreflectance of all existing devices in the ROAD SYSTEM by an individual or legal entity with proven expertise in this type of service.

The retroreflectance evaluation must be carried out using retroreflectometer equipment with calibration not exceeding 1 (one) year, whose calibration certificate must be issued in Portuguese by a competent body. The service must be performed in agreement with the specifications and procedures established in the technical standards ABNT NBR 14.644 and NBR 15.426 or others that may replace or change them, in force at the time of measurement.

The CONCESSIONAIRE shall provide ARTESP with a digital file, by means of a document filed between the 1st and the 10th of November of each year, containing the schedule of the service to be performed in the following year. The execution of the services presented in the annual schedule must be confirmed through a monthly schedule, detailed by weeks and days, to be filed with ARTESP, in a digital file, between the 1st and the 10th of the months that

precede the months of execution. The execution of the services performed must also be launched in SIGECON with evidence of the completion of the services and integration with MITS.

The first schedule referring to the retroreflectance evaluation must be filed by the CONCESSIONAIRE within 30 (thirty) days after the OPERATION START DATE.

The measurement reports of the retroreflectance indices of vertical signaling (aerial and ground) must be prepared by the CONCESSIONAIRE, according to models defined by ARTESP, and delivered within 15 (fifteen) days from the date of the measurements, in a digital copy.

ARTESP may also, when the inspection exercised requires such action, request, at any time, the evaluation of the retroreflectance index of the vertical sign(s) at specific point(s) to confirm its quality, being the CONCESSIONAIRE obligation, within the defined by ARTESP, evaluate and present the results following the same procedures as regular measurements;

- e.5.3. the warning signaling devices must be replaced, repaired or replaced, within a maximum period of 1 (one) week, whenever inadequacy, absence of signaling, retro-reflectance lower than defined in the standard and/or specification, damage, wear, depredation are found or vandalism.

For signs replaced due to retro-reflectivity lower than that defined in the standard and/or specification, the CONCESSIONAIRE shall forward to ARTESP, within up to 3 (three) days immediately after the replacement, a retro-reflectance report of the revitalized sign proving the performance of the service;

e.6. Temporary use device

- e.6.1. cleaning: should be performed whenever the level of dirt is compromising the visibility and retro-reflectance of these devices. The maximum period for execution is 24 (twenty-four) hours;
- e.6.2. the replacement or complementation of temporary use devices that are in disagreement with manuals and/or standards and/or specifications, with low retroreflectance, deteriorated, degraded, absent, insufficient or non-existent must be provided within 24 (twenty-four) hours. In the case of complementary lighting elements, their permanent operation must be guaranteed, through a stock of lamps or other components necessary for their corrective maintenance;
- e.6.3. In the case of the use of easels as supports for temporary vertical signage, it will only be allowed to use models that fix the sign in a vertical position.

The complementation of temporary use devices must be done in agreement with the recommendations of the Brazilian Traffic Signaling Manual — Contran and the Road Signaling Manual — DER/SP.

e.7. Traffic light signs

e.7.1. cleaning of the focus groups should be performed every 2 (two) months.

If there is dirt that impairs the visibility of the traffic lights, cleaning must be provided within a maximum period of 24 (twenty-four) hours

The CONCESSIONAIRE shall provide ARTESP with a digital file, by means of a document filed between the 1st and the 10th of November of each year, containing the schedule of the service to be performed in the following year. The execution of the services presented in the annual schedule must be confirmed through a monthly schedule, detailed by weeks and days, to be filed with ARTESP, in a digital file, between the 1st and the 10th of the months that precede the months of execution;

e.7.2. in the case of components that compromise the functionality of the traffic light signal, corrective maintenance must be carried out within a maximum period of 2 (two) hours.

f. Structures (bridges, viaducts, tunnels and pedestrian flyover)

Description

This program includes cleaning the drainage devices of special works of art and containment structures, also providing for the replacement of deteriorated support equipment and damaged expansion joints, as well as periodic assessments in addition to inspections of special works of art, according to the Specification. Current technique for "Control of Special Works of Art" (ET-00.000.000-0-C21/002 or ARTESP's technical standard that may change or replace it during the SPONSORED CONCESSION), which will serve as a basis for the progress of the maintenance management of the works. It is also planned to paint or galvanize metal railings and balusters.

Standards

- f.1. general cleaning of internal drainage devices (horns in lost coffins): programmable for at least 2 (two) times a year;
- f.2. general cleaning of external drainage devices (on the platform and accesses) programmable for at least 1 (one) time every 2 (two) months;
- f.3. totally or partially clogged drain element: unclogging in a maximum of 1 (one) week, regardless of the general cleaning schedule;
- f.4. painting or galvanizing metallic railings and balusters: programmable for at least 1 (one) time every 2 (two) years;
- f.5. cleaning or painting surfaces exposed to traffic: programmable for at least 1 (one) time

every 2 (two) years and, in case of graffiti, comply with the provisions 0 of sub-item of item 1.4;

- f.6. expansion joint: programmable cleaning and sealing to be performed at least once a year;
- f.7. damaged or damaged expansion joint: temporary emergency repair, as applicable, within a maximum of 24 (twenty-four) hours;
- f.8. damaged or damaged expansion joint: definitive repair within a maximum of 1 (one) week;
- f.9. replacement of support equipment; immediate whenever a deteriorated or excessively deformed device is detected;
- f.10. inspections according to the Technical Specification in force for “Control of Special Works of Art” (ET-00.000.000-0-C21/002 or other ARTESP technical standard that may change or replace it during the SPONSORED CONCESSION); and
- f.11. inspections and specific conservations for works of art in metallic structure.

g. Operational and support buildings and yards

Description

The conservation/maintenance of buildings and yards includes the replacement and/or repair of the structures, waterproofing, and roofing that make up the operational and support buildings and yards, their masonry and coatings.

It also plans for the replacement and/or repair of waterworks and sewage facilities, the maintenance of streets and gardens, waste collection, maintenance of window frames, locks and windows, cleaning of septic tanks, maintenance of painting, leach fields and, if necessary, of boreholes for water supply, etc.

Standards

- g.1. preventive and corrective maintenance in buildings and operational and support yards must be continuous, in order to keep them in full operating condition. Any non-conformities identified will have a period of 30 (thirty) days for correction/regulation.

h. Collection Control System

Description

This program provides for the conservation/maintenance of all the components and equipment that make up this system and its subsystems, ensuring operation as specified in ANNEX 05.

Standards

h.1. Collection system

All equipment/subsystems that make up the collection control system must have the functionality provided for in APPENDIX C and ANNEX 05.

For this, the CONCESSIONAIRE must have equipment or vital parts of the reservation systems, which will allow immediate replacement.

i. Traffic and transport inspection control system and support for NON-DELEGATE SERVICES.

Description

This program provides for the conservation/maintenance of all the components and equipment that make up this system and its subsystems, ensuring operation as specified in ANNEX 05.

This system comprises the following subsystems:

i.1. General Inspection Station (PGF)

i. road policing module

ii. scale module

- weighing system selective scale
- Weigh-in-Motion System
- weighing system fixed precision scale
- vehicle presence detectors and image records
- control equipment
- peripheral equipment
- signaling devices and security elements
- approach speed detection devices

i.2. Speed Control System

- i. fixed speed control points
- ii. portable type speed meters

i.3. System to Read and Decode Vehicle License Plates (OCR)

Standards

From the implementation of the systems and equipment, according to the deadlines defined in ANNEX 07, all equipment/subsystems that make up the traffic and transport inspection control system and support for NON-DELEGED SERVICES must fully and simultaneously

meet all the requirements established by the ANNEXES 05 and 06, being the CONCESSIONAIRE sole risk the sizing and management of personnel, parts, spare components, stock and whatever else is necessary for the immediate correction of defects, malfunctions or nonconformities.

The CONCESSIONAIRE must have a maintenance management system that must allow, at least, the opening, monitoring and management of work orders open to maintenance teams. At a minimum, the following information must be recorded:

- i. Date and time of failure identification and opening of the work order;
- ii. Type of defect identified;
- iii. Action required for correction; and
- iv. Date and time of completion of maintenance actions, with the restoration of operation of the equipment(s).

The CONCESSIONAIRE shall feed ARTESP's systems with information related to equipment maintenance actions, enabling remote and real-time consultation by the CCI.

The manner in which the CONCESSIONAIRE makes information on equipment maintenance available and the form of integration into ARTESP's systems must fully comply with the procedures, technologies and interfaces defined by ARTESP.

At any time ARTESP may request that the CONCESSIONAIRE feeds its systems with additional information about equipment maintenance, according to procedures and interfaces similar to those that the CONCESSIONAIRE is using.

j. System for communication with Users

Description

This program provides for the conservation/maintenance of all the components and equipment that make up this system and its subsystems, ensuring operation as specified in ANNEX 05.

This system comprises the following subsystems:

j.1. Radiophony System

- i. fixed stations;
- ii. mobile stations;
- iii. portable stations;
- iv. repeater stations.

- j.2. Customer Service System 0800
- j.3. Data Communication System
- j.4. Operational Control Center
- j.5. Communication system with the USER like an emergency telephone (call box)
- j.6. Variable Message Board System – PMVs
 - i. fixed variable message panel;
 - ii. mobile variable message board.

Standards

From the implementation and/or receipt of systems and equipment, according to the deadlines defined in ANNEX 07, all equipment/subsystems listed from item j.1 to item j.7 must fully and simultaneously meet all requirements established by ANNEXES 05 and 06, being the CONCESSIONAIRE risk the sizing and management of personnel, parts, spare components, stock and whatever else is necessary for the immediate correction of defects, malfunctions or nonconformities.

The CONCESSIONAIRE must have a maintenance management system that must allow, at least, the opening, monitoring and management of work orders open to maintenance teams. At a minimum, the following information must be recorded:

- i. Date and time of failure identification and opening of the work order;
- ii. Type of defect identified;
- iii. Action required for correction;
- iv. Date and time of completion of maintenance actions, with the restoration of operation of the equipment(s).

The CONCESSIONAIRE shall feed ARTESP's systems with information related to equipment maintenance actions, enabling remote and real-time consultation by the CCI.

The manner in which the CONCESSIONAIRE makes information on equipment maintenance available and the form of integration into ARTESP's systems must fully comply with the procedures, technologies and interfaces defined by ARTESP.

At any time ARTESP may request that the CONCESSIONAIRE feeds its systems with additional information about equipment maintenance, according to procedures and interfaces similar to those that the CONCESSIONAIRE is using.

- j.7. Communication System with the USER via wireless data network

Description

The CONCESSIONAIRE shall maintain an Electronic Information Exchange System with the User via Wireless Data Network covering the entire length of the granted network. This program provides for the conservation/maintenance of all the components and equipment that make up this system and its subsystems, ensuring operation as specified in ANNEX 05.

Standards

The Electronic System for Exchange of Information with the User via Wireless Data Network shall operate 24 hours a day, every day of the week, including holidays and weekends. Noncompliance with these operability standards will subject the CONCESSIONAIRE to application of respective penalties according to described in this AGREEMENT and in its ANNEXES.

j.8. Ombudsman and Other Channels of Connection with Users

Description

The CONCESSIONAIRE shall maintain the ombudsman and other relationship channels with USERS in full operation and within the established standards, provided for in the legal and infra-legal rules in force, as well as in the regulatory rules and ordinances of ARTESP, and under the terms of the REQUEST FOR BIDS and AGREEMENT.

Standards:

- j.8.1. maintenance, operation and dissemination of the 0800-telephone system: from the START OF OPERATION DATE;
- j.8.2. maintenance, operation and disclosure of the ombudsman: from the START OF OPERATION DATE;
- j.8.3. maintenance, operation and disclosure of other user relationship channels provided for in current legislation: after 45 (forty-five) days from the OPERATION START DATE;
- j.8.4. compliance with the requirements related to human, material and technological resources established in the current legislation regarding the ombudsman and other relationship channels with the USER: after 90 (ninety) days from the OPERATION START DATE;
- j.8.5. compliance with operational, administrative and procedural requirements provided for in current legislation regarding the ombudsman and other relationship channels with the USER: after 90 (ninety) days from the OPERATION START DATE;

- j.8.6. compliance with the requirements and quality indicators and deadlines provided for in the current legislation regarding the ombudsman and other channels of relationship with the user: after 90 (ninety) days from the OPERATION START DATE.

k. Traffic Monitoring System

Description

This program provides for the conservation/maintenance of all the components and equipment that make up this system and its subsystems, ensuring operation as specified in ANNEX 05.

This system comprises the following subsystems:

- k.1. Traffic sensing system
- k.2. Traffic Monitoring System via CFTV

Standards

From the implementation and/or receipt of the systems and equipment, according to the deadlines defined in ANNEX 07, all equipment/subsystems listed from item k.1 to item k.2 must fully and simultaneously meet all the requirements established by ANNEX 05, the sizing of the CONCESSIONAIRE being at risk and management of personnel, parts, spare components, stock and whatever else is necessary for the immediate correction of defects, malfunctions or nonconformities.

The CONCESSIONAIRE must have a maintenance management system that must allow, at least, the opening, monitoring and management of work orders open to maintenance teams. At a minimum, the following information must be recorded:

- i. date and time of failure identification and opening of the work order;
- ii. type of defect identified;
- iii. action required for correction;
- iv. date and time of completion of the maintenance actions, with the reestablishment of the operation of the equipment(s).

The CONCESSIONAIRE shall feed ARTESP's systems with information related to equipment maintenance actions, enabling remote and real-time consultation by the CCI.

The manner in which the CONCESSIONAIRE makes information on equipment maintenance available and the form of integration into ARTESP's systems must fully comply with the procedures, technologies and interfaces defined by ARTESP.

At any time ARTESP may request that the CONCESSIONAIRE feeds its systems with additional information about equipment maintenance, according to procedures and interfaces similar to those that the CONCESSIONAIRE is using.

I. Lighting

Description

This program provides for the conservation/maintenance of the external lighting systems of the scale squares, Military Highway Police stations, vehicle arrest yards, interchanges and tunnels, pedestrian flyover, lighting in the OAEs, stretches of the highway that cross urban areas. It also provides for the conservation/maintenance of all building lighting and existing light signaling in the ROAD SYSTEM.

The internal and external lighting systems must offer a lighting pattern compatible with the specific functions and climatic conditions, in the required periods during the day or night and in agreement with the ABNT standards in force for public lighting.

Public lighting maintenance/conservation and complementation services must be started immediately after the OPERATION START DATE

This system comprises the following subsystems:

- I.1. Iluminação viária;
- I.2. Building lighting; and
- I.3. Light signage.

Standards

The lighting conservation/maintenance services are basically as follows:

- i. replacement of lamps or luminaires;
- ii. replacement of reactors and igniters;
- iii. replacement of poles;
- iv. replacement of circuit breakers or fuses;
- v. cleaning luminaires; and
- vi. restoration/completion of the electrical system.

The replacement or repair must be carried out within a maximum of 24 (twenty-four) hours.

The replacement of posts must be carried out in a maximum of 1 (one) week.

Cleaning must be done every 2 (two) months. If dirt compromises the legibility of the sign, cleaning must be carried out within a maximum period of 24 (twenty-four) hours.

These internal and external lighting systems will offer a standard compatible with the specifications of current regulations.

m. Electrification

Description

This program plans for maintenance of high and low voltage lines, repair and substitution of substations and transformers, repair of motor-generator sets and control panels, replacement of connectors, circuit breakers and fuses, repairs in switchboards and battery banks, maintenance of lightning protection systems, etc.

This system comprises the following subsystems:

m.1. High voltage lines;

m.2. Low voltage lines;

m.3. Substations and primary cabins;

m.4. Motor generators; and

m.5. No-break systems.

Standards

The standard for maintenance of high and low voltage lines, substations, transformers, motor-generators and "No Break" systems must be compatible with the standards of the local electric energy CONCESSIONAIRE.

1.5. Routine Conservation Scheduling and Accomplishment Reports

1.5.1. Weekly and Monthly Report of Activities Developed

All routine Maintenance services performed by the CONCESSIONAIRE will be the object of daily notes. These notes must include the highway, kilometer, lane, location (e.g., central median, lane 1, side) and the type of service performed according to ET-Technical Specification Standardization of Routine Conservation Events. The schedule and performance of the services performed must be released in SIGECON with evidence of the completion of the services and integration with MITS, while there is no such systemic integration, the CONCESSIONAIRE must send the schedule of routine canning events on a weekly basis according to said technical specification.

For the purpose of rationalization, compilation and future analysis, routine conservation services should be identified according to the following program:

a Program - pavement

a.1. Subprogram – flexible flooring

- a.1.1. Activity – pot, hole or detachment;
- a.1.2. Activity – definitive repair with clipping;
- a.1.3. Activity – depression in the encounter with OAE;
- a.1.4. Activity – depression or repression of small extent;
- a.1.5. Activity – compromised rolling cloth;
- a.1.6. Activity – moderately compromised rolling cloth;
- a.1.7. Activity – sealing of cracks;
- a.1.8. Activity – step between runway and shoulder.

a.2. Subprogram – rigid pavement

- a.2.1. Activity – pot or hole;
- a.2.2. Activity – definitive repair with clipping;
- a.2.3. Activity – depression in the encounter with OAE;
- a.2.4. Activity – construction joints and cracks;
- a.2.5. Activity – broken edges and/or slabs.

b Program - RIGHT-OF-WAY

b.1. Subprogram – conservation of the vegetal covering

- b.1.1. Activity – manual or mechanized pruning;
- b.1.2. Activity – weeding;
- b.1.3. Activity – mass resulting from pruning;
- b.1.4. Activity – refilling;
- b.1.5. Activity – firebreaks;
- b.1.6. Activity – disengagement;

- b.1.7. Activity – maintenance of trees and shrubs;
- b.1.8. Activity – cutting and pruning of trees and shrubs;
- b.1.9. Activity - cutting and pruning of trees and shrubs that pose a danger to road safety;
- b.1.10. Activity – recomposition of vegetal covering.
- b.2. Subprogram – cleaning
 - b.2.1. Activity – solid waste from operational and support facilities;
 - b.2.2. Activity – waste, rubble or plant remains;
 - b.2.3. Activity – cleaning and sweeping of paved areas subject to deposition of debris or vegetation growth;
 - b.2.4. Activity – cleaning of paved central bed;
 - b.2.5. Activity – dead animals within the lanes;
 - b.2.6. Activity - dead animals within the limits of the RIGHT-OF-WAY, but outside the lanes;
 - b.2.7. Activity – canals and rivers.
- b.3. Subprogram – cut or fill erosions
 - b.3.1. Activity – emergency services
- b.3.2. Activity – definitive correction or recomposition
- b.4. Subprogram – monuments and public utilities
 - b.4.1. Activity – monuments and public utilities that are damaged, damaged or in poor condition
- b.5. Subprogram – graffiti
 - b.5.1. Activity – graffiti on monuments and other places in the RIGHT-OF-WAY, with the exception of graffiti on vertical signs
- b.6. Subprogram – lateral conformation
 - b.6.1. Activity - step removal and land regularization

b.7. Subprogram – vedos – fences, walls, fences and screens

b.7.1. Activity – Damaged, missing, worn out or defaced items

c Program - drainage

c.1. Subprogram - platform surface drainage

c.1.1. Activity – general cleaning;

c.1.2. Activity – damaged or damaged drainage element;

c.1.3. Activity – lateral conformation;

c.1.4. Activity – totally or partially obstructed drainage element.

c.2. Subprogram – surface drainage outside the platform

c.2.1. Activity – cleanup for the system in general;

c.2.2. Activity – damaged or damaged drainage element;

c.2.3. Activity – totally or partially obstructed drainage element.

c.3. Subprogram – culverts, galleries and drains

c.3.1. Activity – general cleaning;

c.3.2. Activity – damaged or damaged drainage element;

c.3.3. Activity – totally or partially obstructed drainage element.

c.4. Subprogram – pickup boxes

c.4.1. Activity – general cleaning;

c.4.2. Activity – damaged or damaged drainage element;

c.4.3. Activity – totally or partially obstructed drainage element.

c.5. Subprogram – tunnel drainage

c.5.1. Activity – general cleaning;

c.5.2. Activity – occurrence of water on the runway;

c.5.3. totally or partially clogged drain element.

c.6. Subprogram – wildlife passageways

c.6.1. Activity – general cleaning;

c.6.2. Activity – vegetation management;

c.6.3. Activity – totally or partially obstructed drainage element.

c.7. Subprogram – Hazardous Goods Containers and Leakage Boxes

c.7.1. Activity – general cleaning;

c.7.2. Activity – inspection;

c.7.3. Activity – general cleaning after any spill;

c.7.4. Activity – transport of leaked materials;

c.7.5. Activity – totally or partially obstructed drainage element.

d Program - road restraint device

d.1. Subprogram – flexible devices

d.1.1. Activity – standardization;

d.1.2. Activity – removal, relocation, adaptation or implantation;

d.1.3. Activity – broken/damaged devices that pose a risk to the USER's safety;

d.1.4. Activity – broken/damaged devices that do not pose a risk to the USER's safety;

d.1.5. Activity – cleaning, washing or painting.

d.2. Subprogram – hard devices

d.2.1. Activity – standardization;

d.2.2. Activity – removal, relocation, adaptation or implantation;

d.2.3. Activity - damaged device that poses a risk to the USER's safety;

d.2.4. Activity - damaged device that does not pose a risk to the USER's safety;

d.2.5. Activity – cleaning, washing or painting.

d.3. Subprogram – anti-glare devices

- d.3.1. Activity – standardization;
- d.3.2. Activity - device damaged/broken and/or deteriorated and/or stolen and/or depredated and/or misaligned that poses a risk to the USERS' safety;
- d.3.3. Activity – device damaged/broken and/or deteriorated and/or absent and/or damaged and/or misaligned that does not pose a risk to the USER's safety;
- d.3.4. Activity – cleaning, washing or painting.
- d.4. Subprogram – guardrails and balusters
 - d.4.1. Activity - damaged device that poses a risk to the USER's safety;
 - d.4.2. Activity - damaged device that does not pose a risk to the USER's safety;
 - d.4.3. Activity – cleaning, washing or painting.
- e Program - signaling and auxiliary devices
 - e.1. Subprogram - horizontal signage
 - e.1.1. Activity – cleaning;
 - e.1.2. Activity – retroreflectance;
 - e.1.3. Activity – painting or repainting;
 - e.1.4. Activity – recomposition;
 - e.1.5. Activity – manual repainting or reapplication.
 - e.2. Subprogram – vertical signage
 - e.2.1. Activity – cleaning (ground/aerial);
 - e.2.2. Activity – retroreflectance (ground/aerial);
 - e.2.3. Activity – repair or replacement of regulatory or warning signs (ground/air);
 - e.2.4. Activity – repair or replacement of other signposts (ground/air);
 - e.2.5. Activity – broken frames and/or semi-frames;
 - e.2.6. Activity – inadequacies in vertical signage;
 - e.2.7. Activity – measuring retroreflectance.

e.3. Subprogram – enclosing devices

e.3.1. Activity – cleaning of tacks or studs;

e.3.2. Activity – cleaning of beacons, delineators and delimiter cylinders;

e.3.3. Activity – implantation of tacks and studs;

e.3.4. Activity – implantation of beacons, delineators and delimiter cylinders.

e.4. Subprogram – plumbing device

e.4.1. Activity – Cleaning / painting;

e.4.2. Activity - implementation of plumbing devices;

e.4.3. Activity – scheduled cleaning.

e.5. Subprogram – warning signs devices

e.5.1. Activity – cleaning;

e.5.2. Activity – retroreflectance;

e.5.3. Activity – repair and substitution.

e.6. Subprogram – temporary use device

e.6.1. Activity – cleaning;

e.6.2. Activity – substitution.

e.7. Subprogram – Traffic lights

e.7.1. Activity – cleaning;

e.7.2. Activity – maintenance.

f Structures

f.1. Subprogram – bridges, viaducts, tunnels and pedestrian flyover

f.1.1. Activity – general cleaning of internal drainage devices;

f.1.2. Activity – general cleaning of devices of external drainage;

f.1.3. Activity – totally or partially obstructed drainage element;

- f.1.4. Activity – painting / galvanizing of metallic guardrail and balusters;
 - f.1.5. Activity – cleaning/ painting of surfaces exposed to traffic;
 - f.1.6. Activity – damaged or broken expansion joint (temporary repair);
 - f.1.7. Activity – damaged or broken expansion joint (definitive repair);
 - f.1.8. Activity - substitution of support device;
 - f.1.9. Activity - inspections according to Technical Specifications;
 - f.1.10. Activity - specific inspections and conservations;
 - f.1.11. Activity – specific inspections and conservation.
- g Program – operational and support buildings and yards
 - g.1. Subprogram – each operational or support building or yard represents a specific subprogram
 - g.1.1. Activity - preventive and corrective conservations
- h Program - control and collection system
 - h.1. Subprogram - collection system
 - h.1.1. Activity – each toll station in the system represents an activity of this subprogram
- i Program - supervision control system
 - i.1. Subprogram – General Supervision Post – PGF (road policing module and weighing scale module)
 - i.1.1. Activity - each PGF represents an activity of this subprogram
 - i.2. Subprogram – speed control system (fixed and mobile)
 - i.2.1. Activity - within this subprogram, the detailing of the activity is waived
 - i.3. Subprogram - system to read and decode vehicle license plates (OCR)
 - i.3.1. Activity - within this subprogram, the detailing of the activity is waived
- j Subprogram – System for communication with Users

j.1. Subprogram – radiophony system

j.1.1. Activity - within this subprogram, the detailing of the activity is waived

j.2. Subprogram – commercial telephone system and 0800

j.2.1. Activity - within this subprogram, the detailing of the activity is waived

j.3. Subprogram - data communication system

j.3.1. Activity - within this subprogram, the detailing of the activity is waived

j.4. Subprogram – operational control center

j.4.1. Activity - within this subprogram, the detailing of the activity is waived

j.5. Subprogram – Emergency telephone-type communication system with the USER (call box)

j.6. Subprogram – Variable-message sign (VMS) (fixed and mobile)

j.6.1. Activity - within this subprogram, the detailing of the activity is waived

j.7. Subprogram – communication system with the USER or via wireless data network

j.7.1. Activity - within this subprogram, the detailing of the activity is waived

j.8. Subprogram – ombudsman and other relationship channels with the USER

j.8.1. Activity - within this subprogram, the detailing of the activity is waived

k Program - Traffic Monitoring System

k.1. Subprogram – traffic sensing system

k.1.1. Activity – each system used for this purpose corresponds to an activity within this subprogram

k.2. Subprogram - CFTV traffic monitoring system

k.2.1. Activity – each system used for this purpose corresponds to an activity within this subprogram

l Program - Lighting

l.1. Subprogram – street lighting

l.1.1. Activity - no lamp, off, burned out or malfunctioning lamp

l.2. Subprogram – building lighting

l.2.1. Activity - no lamp, off, burned out or malfunctioning lamp

l.3. Subprogram – light signaling

l.3.1. Activity - within this subprogram, the detailing of the activity is waived

m Program - electrification

m.1. Subprogram – high voltage lines

m.1.1. Activity - within this subprogram, the detailing of the activity is waived

m.2. Subprogram – low voltage lines

m.2.1. Activity - within this subprogram, the detailing of the activity is waived

m.3. Subprogram – substations and primary cabins

m.3.1. Activity - within this subprogram, the detailing of the activity is waived

m.4. Subprogram – motor generators

m.4.1. Activity - within this subprogram, the detailing of the activity is waived

m.5. Subprogram – *no-break* systems

m.5.1. Activity - within this subprogram, the detailing of the activity is waived

The CONCESSIONAIRE must feed SIGECON based on the daily notes of the services and, from the system, generate the "monthly report of routine conservation services" and to be made available digitally in a system with *online* access by ARTESP.

The monthly reports of routine maintenance services will be formally delivered by the CONCESSIONAIRE to ARTESP, in 1 (one) digital copy, until the 10th (tenth) business day of the month following the purpose of the report.

This system shall be adopted from the OPERATION START DATE, for the ROAD SYSTEM, and shall be continuous until the end of the AGREEMENT.

If the information provided is not satisfactory, ARTESP may request data collection and reports to enable specific analyses.

1.5.2. Annual Drainage Programming and Realization Report

The CONCESSIONAIRE shall prepare an annual report on the drainage schedule and conservation

conditions based on the road drainage inventory, as well as a photographic report of all crossings under the lanes and highway loops, which will be formally delivered to ARTESP in a digital copy, annually, on a date to be defined by ARTESP. These activities will commence after the OPERATION START DATE. Identified problems must be completely solved in accordance with the deadlines established in item 1.4 - Description and Standards for Programs - Program "C" - Drainage, in this ANNEX.

1.5.3. Annual and monthly schedules of conservation services

The CONCESSIONAIRE must prepare annual and monthly programs for routine maintenance services, which must follow the same programmatic criteria used in the "Monthly Report of Routine Maintenance Services".

The CONCESSIONAIRE shall provide ARTESP with a digital file of the annual schedule of routine conservation/maintenance services, by means of a document filed between the 1st and the 10th of November of each year, containing the schedule of services to be performed in the year subsequent. The execution of the services presented in the annual schedule must be confirmed through the monthly schedules, to be filed with ARTESP, in a digital file, between the 1st and 10th of the months preceding the months of execution.

The annual program of maintenance services must provide detailed information for each highway, program, subprogram and activity, with monthly time intervals.

The monthly schedule of the conservation/maintenance services to be performed must be detailed by road, sections, program, sub-program and activity, with weekly time intervals, always in line with the periods and cycles indicated in the annual schedule by activity.

Annual and monthly programs must be prepared in accordance with the models defined by ARTESP.

1.5.4. Monitoring system for slopes / slopes prone to instability

Based on its inspection prior to presentation of its Proposal, the CONCESSIONAIRE must estimate quantities relative to implementation of a system for monitoring embankments and slopes prone to instability. This monitoring will consist in the instrumentation of embankments and slopes with higher landslide risks and the development of an effective monitoring system, allowing the CONCESSIONAIRE to detect any problems timely, especially after rains.

An annual report including a Geologist's and a Geotechnical Engineer's interpretation of the monitoring data must be provided to ARTESP.

Any problems identified must receive priority in the CONCESSIONAIRE's routine and emergency Maintenance programs.

1.6. Supervision

All the CONCESSIONAIRE's activities will be supervised by ARTESP or through its technical agents, and may be assisted by a service provider company, supervised by ARTESP, in the form of the "operational procedure - PO.DIN/041" in its latest revision or another that may come to replace it.

All performance data, evidence, collected, generated and updated must be updated in the SIGECON

digital system, according to the deadlines required in the REQUEST FOR BIDS, and integrated into MITS.

2. SPECIAL CONSERVATION / MAINTENANCE

2.1. Basic principles

2.1.1. General Provisions

Special conservation/maintenance is the set of works and services necessary for the preservation of the initial investment and adaptation of the ROAD SYSTEM to the standards established by rules and technical specifications and parameters of ARTESP.

It is, therefore, a set of interventions, including adaptations to new technologies and other innovations, which constitute adequate works and services of greater size or technical complexity, necessary as a result of the end of the useful life of parts of the road system. Periodical surveys of the superficial, structural, comfort conditions and of safety of pavements in order to control the minimum parameters required by the REQUEST FOR BIDS.

To this end, the CONCESSIONAIRE will be responsible for all measures related to conservation/maintenance with regard to:

- i. periodic surveys of the surface, structural, comfort and safety conditions of the pavements to control the minimum parameters required in the REQUEST FOR BIDS;
- ii. sizing of the special conservation project;
- iii. studies and projects, which must be developed in accordance with the requirements of environmental licensing; and
- iv. planning and execution of works and installation.

Each of these stages will be accompanied by ARTESP, and the CONCESSIONER must maintain a permanent consultation and approval scheme, observing the necessary environmental licensing processes with the competent authority.

Any work can only be started after the delivery of the certified executive projects and the presentation of the respective environmental installation license or document that proves the negotiations with the environmental agency, in accordance with the legislation in force.

EXECUTIVE PROJECTS for special conservation and their respective quality certificates must be sent to ARTESP under the terms of APPENDIX G.

The identification of services related to special conservation/maintenance will be the responsibility of the CONCESSIONAIRE, with the exception of those already described in this ANNEX. The CONCESSIONAIRE must make available pairs of users/passwords for ARTESP in order to receive communication automatically, consulting and downloads of files of Project by the technical areas of the Law.

Certification will take place in accordance with APPENDIX G.

The CONCESSIONAIRE shall submit a Plan for the Implementation and Development of Projects in BIM Modeling (PD-BIM) under the terms and deadlines set out in APPENDIX G.

2.1.2. Adequacy of Investment Schedule

The anticipation of work provided for in POI or INVESTMENT PLAN in force by the CONCESSIONAIRE's proposal must be presented to ARTESP, which must approve the implementation and the consequent economic-financial rebalancing, to be carried out in the ORDINARY REVISION or, if applicable, EXTRAORDINARY REVIEW.

Cases of anticipation of the duplication work(s) in areas adjacent to investments already in progress, as well as anticipation of the respective device(s) of that section(s) that is (are) essential to the release of the road for safe entry into operation, on the initiative of the CONCESSIONAIRE, will only depend on the prior consent of ARTESP. In these cases, the CONCESSIONAIRE may start the works immediately after obtaining prior consent and does not constitute an event of imbalance.

In the cases provided for in the paragraph above, the request for prior consent must be presented to ARTESP separately, separately from any other request for anticipation or postponement of investment, and accompanied by the identification of the item(s) in the Physical Schedule and with the documentation relevant to the investment(s) to be anticipated, including the respective device(s), if any.

The CONCESSIONAIRE shall communicate justification in writing for any delays in the beginning and end of the work (and the stages that constitute it, according to the INVESTMENT PLAN), without prejudice to the analysis and validation by ARTESP regarding the merits, application of contractually foreseen penalties and recomposition of the economic-financial balance resulting from the delay.

2.1.3. Prerequisites for the start and continuity of the Works

The works can only be started and have their continuity fully guaranteed under the terms and deadlines of APPENDIX G.

In the event of revocation or change in the status of any of the documents provided for in APPENDIX G, the CONCESSIONAIRE may be notified by the Agency to stop the works. In this case, the CONCESSIONAIRE shall take all measures for the timely regularization of the documentation and resumption of the works, under penalty of the sanctions provided for in the contract, REQUEST FOR BIDS and its ANNEXES.

2.1.4. Prerequisites for the reception of the works.

The works can only be considered fully completed if the CONCESSIONAIRE proves compliance with the requirements set out in APPENDIX G.

2.1.5. Functional Projects

Does not apply.

2.1.6. Executive Projects

(a) General Provisions

The EXECUTIVE PROJECTS for the implementation of the works will follow the terms and deadlines set out in APPENDIX G.

The EXECUTIVE PROJECT must follow the premises, concepts and eventual exceptions of the FUNCTIONAL PROJECT previously approved by ARTESP.

(b) Executive Project Quality Certification

The CONCESSIONAIRE must obtain certification under the terms and deadlines of APPENDIX G and must use SISPROJ, from its implementation, to register, in full, all documentation referring to the processing of EXECUTIVE PROJECTS.

2.2. Service description and standards

2.2.1. Pavement

Description

The CONCESSIONAIRE shall prepare a program in accordance with the provisions of its POI and other INVESTMENT PLANS, which shall contain detailed studies and executive projects. In said program, the deadlines for the execution of special conservation interventions of the various segments of the ROAD SYSTEM must be established in order to meet the standards and specifications required in the AGREEMENT throughout the SPONSORED CONCESSION.

The CONCESSIONAIRE is responsible for EXECUTIVE PROJECTS for the special maintenance of pavements. In the first year after the OPERATION START DATE, the CONCESSIONAIRE shall implement the SISSOND - INTEGRAL DIGITAL SYSTEM FOR DRILLING AND TESTS, as defined in APPENDIX F.

When the project is submitted to ARTESP, the database of the GSP of the CONCESSIONAIRE must be updated with the new values of the surveys of surface, structural, comfort and safety conditions of the sidewalks, as well as any new traffic volume counts, results of complementary geotechnical tests and mechanical properties of the materials that make up the sidewalk structures and, finally, with the solutions proposed for special conservation. Any revisions to the projects may be submitted for analysis by ARTESP during the progress of the special conservation works, but with the necessary advance, in order not to jeopardize the deadline defined for the execution of the service that corresponds to that revision.

The minimum interval between special conservation interventions will be 5 (five) years in the same segment.

At the conclusion of the work of the first special conservation cycle, the pavement, including shoulders and safety lanes, as well as the dirt roads or primary coating, must comply with the levels provided for in APPENDIX C and APPENDIX H.

If the CONCESSIONAIRE chooses to implement an alternative solution that justifiably waives the periodicity provided for special conservation provided for in ANNEX 21, it may submit a separate program for approval by ARTESP, which will not lead to economic and financial rebalancing of the AGREEMENT, without prejudice to the need to meet of the IQD and Performance Indicators provided for in ANNEX 03 and ANNEX 06.

Standards

Surface Conditions

The conditions of surface defects may be evaluated according to the methodologies and procedures adopted by the National Department of Transport Infrastructure - DNIT and DER/SP in the road rules indicated below or others that may replace or change them during the SPONSORED CONCESSION:

- i. DNIT 006/2003-PRO – “objective evaluation of the surface of flexible and semi-rigid pavements”;
- ii. DNIT 062/2004-PRO – “rigid pavement – objective assessment”;
- iii. In order to admeasurements be executed it should be used a popular vehicle representative of the circulating fleet of ramble car with mileage under 15.000 (fifteen thousand) km experienced and tires in good conditions of preservation (new). The surveys should be executed through measuring the internal sound to the vehicle with the use of the equipment type digital sound-level meter calibrated appropriately.
- iv. The vehicle should maintain the maximum velocity regulated for the Road segment in study. The windowpanes of the vehicle should be completely closed and the measurement equipment positioned on the left shoulder of the driver.
- v. USDA TM 5-626 / 1995 – “*Unsurfaced Road Maintenance Management*” for dirt roads or primary coatings within the RIGHT-OF-WAY of the system's highways.

Comfort Conditions

The procedure described above could be changed or updated through the publication of new regulations and instructions by ARTESP. Minimum Parameters Required. To this end, the "irregularity quotient - IQ" will be controlled, measured by "response type" equipment or by "longitudinal profilometers" (preferably using laser profilometers).

Surveys of irregularities must comply, at least, with the procedures and specifications of the road rules indicated below, or others that may replace or complement them during the SPONSORED CONCESSION:

- i. DNER PRO-159/85 – project for the restoration of flexible and semi-rigid pavements,

chapters referring to irregularities assessment procedures;

- ii. DNER PRO-164/94 – calibration and control of pavement surface irregularity measurement systems (integrating systems IPR/USP and *Maysmeter*). The calibration sections must be approved by ARTESP;
- iii. DNER ES-173/86 – level and crosshair method for calibrating response-type irregularity measuring systems; and
- iv. DNER PRO-182/94 – measurement of pavement surface irregularities with IPR/USP and *Maysmeter* integrators.

Deflectometric conditions

The recoverable deflections must be determined in the case of single-track highways every 20 (twenty) meters of track, that is, every 40 (forty) meters of track. In case of multilane highways, the recoverable deflections shall be determined each 40 (forty) meters in the heavy traffic lane and at each 80 (eighty) meters in the other bearing strips.

To determine the recoverable deflections, Benkelman beams, electronic *beams* or *Falling Weight Deflectometer-type* impact deflectometers may be used, and must comply with the DNIT rules indicated below, or others that may replace or change them during the SPONSORED CONCESSION:

- i. DNER ME 024/94 - Pavement - determining deflections by the Benkelman Beam;
- ii. DNER ME 061/94 - Pavement - delineation of the longitudinal influence line of the deformation basin by means of the Benkelman Beam;
- iii. DNER ME 039/94 - Pavement - Determination of deflections by Dynaflect;
- iv. DNER PRO 175/94 – Beam Benkelman Measurement; and
- v. DNER PRO 273/96 - Determination of deflections using the impact deflectometer type "Falling Weight Deflectometer - FWD".

In addition to determining the recoverable deflections in all the locations mentioned above, delineations of the longitudinal influence line of the elastic deformation basin must be carried out every 400 (four hundred) meters of roadway in the case of the use of the *Benkelman* beam.

When carrying out the deflectometric survey, the temperatures of the asphalt coating layer must be measured every 60 (sixty) minutes. If a temperature divergence from the reference temperature of 21 °C is verified, the temperature adjustment factors indicated in the DNER ME-024/94 test method must be used.

In addition to the deflectometric survey campaign, a campaign of rotating soundings on the pavement should be carried out with equipment such as a "glass saw" with a diameter of 10 (ten) centimeters. The surveys will be carried out close to the kilometer milestones of the highway for location reference, with an average frequency of one survey every 5,000 (five thousand) meters of track in the first 5 (five) years

of the SPONSORED CONCESSION. From the sixth year of the SPONSORED CONCESSION onwards, the frequency must be one survey every 25,000 (twenty-five thousand) meters of runway. The points should be alternated in each of the campaigns. The materials and component thicknesses of the lining and base layers must be recognized, as well as a cumulative record maintained, in order to provide a gradual mapping of the structures of the existing pavements in the road network, which will be used in studies and projects, as well as in the GSP.

The structural reinforcement calculation procedures assume the use of a *Benkelman* beam for lifting recoverable deflections. If other equipment is used, it is essential to carry out a deflectometric survey with the *Benkelman* beam in a minimum extension of 5,000 (five thousand) meters to determine the correlation coefficient between the equipment.

Notes:

- i. the equipment to be used in the deflectometric survey must be calibrated at the beginning of the work;
- ii. the certificate of weighing the truck's rear axle used in the survey with the *Benkelman* beam or with the electronic beam must be sent to ARTESP, together with the survey results; and
- iii. in the case of the FWD and the electronic beam, digital copies of the field data acquisition files must be sent to ARTESP.

Safety conditions

Methods and equipment for measuring texture and slip resistance are used to determine the safety conditions of sidewalks.

For the correct evaluation of the pavement macrotexture, surface scanning equipment (laser technology) capable of acquiring 3D and 2D image data of the road surface with a minimum resolution of 1 (one) millimeter over a minimum width of 4 (four) meters on a track with speeds of up to 100 (one hundred) km/h. The minimum range of measurements must be two points (internal and external tracks) for every 100 (one hundred) meters of the length of the roadway. All lanes should be evaluated.

Sand stain tests may be used for eventual calibration / confirmation of the results obtained with surface scanning equipment.

In addition to sidewalk macrotexture data, the following road geometry data must be collected with surface scanning equipment: longitudinal slope (i), superelevation or transverse slope (e), horizontal curvature radius (R). The same interval of 100 (one hundred) meters must be used in each lane.

Based on macro-texture data and wet road accident rates, the segments for evaluation of the friction coefficient must be defined (minimum sampling of 20% (twenty percent) of the road network in at least one segment in each of the lanes of bearing of each of the highways of the ROAD SYSTEM).

To evaluate the friction coefficient of the floor coverings, *Grip Tester* (or similar) equipment should be used and, for eventual calibrations and measurements, the British pendulum equipment. For the *Grip*

Testertest, the water depth must be at least 0.50 mm.

The *Grip Tester* evaluation segments should be one hundred (100) meters long (individual values determined for every one hundred (100) meters of assessment length). Additionally, it is recommended to schedule surveys in continuous sections with a length of not less than 1 (one) kilometer.

The adhesion values of a pavement, that is, the macrotexture and microtexture, will be quantified through the HS (sand height), VRD (skid resistance value), GN (*Grip Number*) and IFI (*International Friction Index*) indices. .

Rolling noise conditions

For the measurements to be carried out, a popular vehicle representative of the circulating fleet of passenger cars must be used, with less than 15,000 (fifteen thousand) kilometers driven and tires in good conditions of conservation (new).

The surveys must be carried out by measuring the internal noise of the vehicle with the use of equipment such as a digital decibel meter, which must be properly calibrated.

The vehicle must maintain the maximum speed regulated for the road segment under study. Movable windows and windbreaks located on the impact side of the vehicle must be completely closed.

The driver must be careful not to cause additional noises that may interfere with the measurement, in addition to the noise caused by the actual act of driving (steering wheel, shifting gears, etc.). Other sources that generate noise inside the vehicle must also be turned off (radio, cell phones, air conditioning, etc.).

Whenever there are external elements and/or random events that interfere with noise measurements, with the exception of those related to the condition of the pavement surface, these must be disregarded and redone, so that a faithful picture of the average condition of hearing comfort can be obtained. / safety in free-flow conditions due to tire-pavement interaction.

The procedure described above may be changed or updated through the publication of new rules and instructions by ARTESP during the SPONSORED CONCESSION.

Minimum Parameters Required

The sidewalk components of the ROAD SYSTEM (including shoulders, safety lanes, marginals and junction devices up to the limits of the RIGHT-OF-WAY) should be analyzed for their surface conditions, comfort, deformability, remaining life and safety. After the first scheduled intervention, the pavement acceptability parameters for these conditions must be fully met throughout the CONCESSION TERM. They are as follows:

- (a) Surface Conditions;
- (b) For a minimum evaluation extension of 200 (two hundred) meters and a maximum of 1,000 (one thousand) meters, per roadway, according to the Summary Tables of pavement performance parameters;

(c) Comfort conditions.

For a minimum evaluation extension of 200 (two hundred) meters and a maximum of 1,000 (one thousand) meters per lane, according to the table.

The value to be considered will be the average of the individual values (of the homogeneous segments with a minimum length of 200 (two hundred) meters and a maximum of 1000 (one thousand) meters of irregularity measurement in the kilometer, and there cannot be individual values greater than 15% (fifteen percent) of the average. If there are individual values greater than 15% (fifteen percent) of the average, the CONCESSIONAIRE will act in the stretches, in order to fit the kilometer into the standards established in this ANNEX.

(d) Deformability conditions and remaining life

i. recoverable deflections

The characteristic recoverable deflections (D_c) for a minimum assessment extension of 200 (two hundred) meters and a maximum of 1,000 (one thousand) meters per lane will be represented by the sum of the arithmetic mean of the individual deflections, measured with the standard deviation of the sample.

The CONCESSIONAIRE shall use the HDM-4 program to establish the remaining life, through models developed specifically for performance curves or other program that ARTESP may indicate during the SPONSORED CONCESSION.

Remaining Life

The condition to be required for the remaining life at the end of the SPONSORED CONCESSION period of the system highways will be:

$$VR > 5 \text{ (five) years}$$

Where:

VR - remaining life of each of the homogeneous segments of, at most, 1000 (one thousand) meters

Remaining life of a pavement is understood to be the minimum period of time that the intervention carried out provides structural and functional parameters above the maximum values previously established.

The assessment of the VR must be carried out in all the lanes of each lane, in accordance with the current regulations of ARTESP, DER/SP and DNIT, and using established performance models, such as the HDM- 4.

(e) Security conditions / macrotexture

i. macrotexture

The individual values and the average per kilometer of the HS parameter should be evaluated. The measurement must be carried out on the inner and outer wheel tracks, on all lanes, with a maximum spacing of 100 (one hundred) meters.

(f) Height of sand (HS), measured with surface scanning equipment (laser) and/or sand stain test, according to Summary Tables of pavement performance parameters.

i. coefficient of friction

(g) The individual values of the measured segments (length of 100 (one hundred) meters) and the average per kilometer of the VRD index and GN index contents must be evaluated, according to the summary tables of pavement performance parameters:

- i. skid resistance value measured by test with a British pendulum and/or Grip Tester type equipment (preferred), according to the tables in the item(f).
- ii. skid resistance value measured by Grip Tester type equipment, according to the tables in the item(f).

In addition to the individual control of the macrotexture, measured by means of the sand stain test and the friction coefficient, obtained through the skid resistance test, measured by the British pendulum or by means of any of the equipment contemplated in the ASTM E-1960 standard (2001), it is mandatory to determine the international friction index IFI (*International Friction Index*).

The minimum values of IFI recommended for new roads and for restored roads are those presented in the table in item i.

(h) Rolling noise conditions

i. criteria for all existing routes up to the fourth year of SPONSORED CONCESSION:

During the measurement in the highway lanes, none of the segments may present noise levels predominantly higher than 77 (seventy-seven) dBA (decibel) for more than 10 (ten) uninterrupted seconds of measurement (50% - fifty percent) or more of the individual values measured in the period must be less than 77 (seventy-seven) dBA.

In the rolling lanes, the average value per homogeneous evaluation segment (maximum length of 1,000 (one thousand) meters) cannot exceed the value of 77 (seventy-seven) dBA.

ii. criteria for the roads implemented by the CONCESSIONAIRE and for all existing roads from the 5th year of the SPONSORED CONCESSION onwards:

During the measurement in the highway lanes, none of the segments may present

noise levels predominantly higher than 75 (seventy-seven) dBA (decibel) for more than 10 (ten) uninterrupted seconds of measurement (50% - fifty percent) or more of the individual values measured in the period must be less than 75 (seventy-seven) dBA.

In the rolling lanes, the average value per homogeneous evaluation segment (maximum length of 1,000 (one thousand) meters) cannot exceed the value of 75 (seventy-seven) dBA.

All lanes of highways must be evaluated, except for shoulders.

SUMMARY TABLES OF FLOOR PERFORMANCE PAVEMENTS:

ANNEX 06 – Rodoanel Norte Lot

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Pavement Performance Pavements - Trunk Highways (SPs, SPIs, SPAs) and Marginal Roads					
Parameters	Road System				The entire system on the concession delivery date
	Validity: Start of Operation Date to the 3rd year of Concession	Validity from the 4th year of the Concession to the 15th year of the Concession	Validity from the 16th year of the Concession to the 15th year of the Concession	Validity: From the 25th year of Concession	
Maximum percentage of area with potholes and breakdown					
Area percentage with class 3 crack	FC 3 ≤ 2%	FC 3 ≤ 2%	FC 3 ≤ 2%	FC 3 ≤ 2%	FC 3 ≤ 2%
Area percentage with class 2 crack	FC 2 ≤ 15%	FC 2 ≤ 15%	FC 2 ≤ 15%	FC 2 ≤ 15%	FC 2 ≤ 15%
Wheel track siking (F)	F ≤ 7 mm	F ≤ 7 mm	F ≤ 7 mm	F ≤ 7 mm	F ≤ 7 mm
Maximum unevenness between the roadway and the shoulder	12mm	12mm	12mm	12mm	12mm
Maximum number of good patches (low severity level)		20 patches. Above 20 patches in an extension of 1,000 meters and above 4 patches in an extension of 100 meters it is essential to carry out continuous surface intervention	20 patches. Above 20 patches in an extension of 1,000 meters and above 4 patches in an extension of 100 meters it is essential to carry out continuous surface intervention	20 patches. Above 20 patches in an extension of 1,000 meters and above 4 patches in an extension of 100 meters it is essential to carry out continuous surface intervention	20 patches. Above 20 patches in an extension of 1,000 meters and above 4 patches in an extension of 100 meters it is essential to carry out continuous surface intervention
Maximum number of patches in poor condition (high severity level)		0	0	0	0
Global Severity Index (1)	IGG ≤ 30	IGG ≤ 30	IGG ≤ 30	IGG ≤ 30	IGG ≤ 30
Pavement Condition Index (2)		PCI ≥ 75	PCI ≥ 75	PCI ≥ 75	PCI ≥ 75
Unsurfaced Road Condition Index (3)	LRCI ≥ 75	LRCI ≥ 75	LRCI ≥ 75	LRCI ≥ 75	LRCI ≥ 75
Irregularity Quotient (IQ) or International Roughness Index (IRI) (4)	IQ ≤ 35 counts/km or IRI ≤ 2.69 m/km for paved roads	IQ ≤ 35 counts/km or IRI ≤ 2.69 m/km for paved roads	IQ ≤ 32 counts/km or IRI ≤ 2.46 m/km for paved roads	IQ ≤ 26 counts/km or IRI ≤ 2.00 m/km for paved roads	IQ ≤ 26 counts/km or IRI ≤ 2.00 m/km for paved roads
	IQ ≤ 78 counts/km or IRI 6m/km on land or primer coating	IQ ≤ 78 counts/km or IRI 6m/km on land or primer coating	IQ ≤ 78 counts/km or IRI 6m/km on land or primer coating	IQ ≤ 78 counts/km or IRI 6m/km on land or primer coating	IQ ≤ 78 counts/km or IRI 6m/km on land or primer coating
Recoverable Deflections Characteristics (Dc)	Allowable Deflection (Dadm) as a function of requesting traffic (N number estimated until the next scheduled intervention)	Allowable Deflection (Dadm) as a function of requesting traffic (N number estimated until the next scheduled intervention)	Allowable Deflection (Dadm) as a function of requesting traffic (N number estimated until the next scheduled intervention)	Allowable Deflection (Dadm) as a function of requesting traffic (N number estimated until the next scheduled intervention)	Allowable Deflection (Dadm) as a function of requesting traffic (N number estimated 5 years of remaining life)
Macrotexture, sand height (HS)		0.8mm < HS < 1.3mm	0.8mm < HS < 1.3mm	0.8mm < HS < 1.3mm	0.8mm < HS < 1.3mm
Skid Resistance Value		VRD > 55	VRD > 55	VRD > 55	VRD > 55
International Friction Index (F) (International Friction Index)		IR ≥ 0.22 new road works IFI ≥ 0.15 for restored pavements	IR ≥ 0.22 new road works IFI ≥ 0.15 for restored pavements	IR ≥ 0.22 new road works IFI ≥ 0.15 for restored pavements	IR ≥ 0.22 new road works IFI ≥ 0.15 for restored pavements
<p>* Surface conditions and comfort for a minimum assessment extension of 200m (two hundred meters) and a maximum of 1,000m (one thousand meters)</p> <p>(1) obtained by means of a survey through procedures DNIT 005/2003 PRO - "Purpose assessment of the surface of flexible and semi-rigid pavements" or specification adopted by ARTESP</p> <p>(2) Portland cement concrete flooring</p> <p>(3) unpaved roads</p> <p>(4) The value to be considered will be the average of the individual irregularity measurement values in the homogeneous segment of, at most, 1000 meters, and there cannot be individual values greater than 15% (fifteen percent) of the average. If there are individual values greater than 15% (fifteen percent) of the average, the CONCESSIONAIRE will act in the sections in order to fit the kilometer into these standards.</p>					

Pavement Performance Parameters - Branches and Devices

Parameters	Validity: From the 3rd year of Concession onwards	The entire system of Branches and Devices on the date of delivery of the concession
Maximum percentage of area with potholes and breakdown	0%	0%
Area percentage with class 3 crack	FC-3 \leq 2%	FC-3 \leq 2%
Area percentage with class 2 crack	FC 2 \leq 15%	FC 2 \leq 15%
Wheel track siking (F)	F \leq 7 mm	F \leq 7 mm
Maximum unevenness between the roadway and the shoulder	12mm	12mm
Maximum number of good patches (low severity level)	20 patches. Above 20 patches in an extension of 1-000 meters and above 4 patches in an extension of 100 meters it is essential to carry out continuous surface intervention	20 patches - Over 20 patches in a length of 1-000 meters and over 4 patches in a length of 100 meters it is essential to carry out continuous surface intervention
Maximum number of patches in poor condition (high severity level)	0	0
Global Severity Index (1)	IGG \leq 30	IGG \leq 30
Pavement Condition Index (2)	ICP \geq 75	ICP \geq 75
Unsurfaced Road Condition Index (3)	URCI \geq 75	URCI \geq 75
Irregularity Quotient (IQ) or International Roughness Index (IRI) (4)	IQ \leq 45 counts/km or RI \leq 3.46 m/km for paved roads	IQ \leq 45 counts/km or RI \leq 3.46 m/km for paved roads
	IQ \leq 78 counts/km or IRI \leq 6 m/km on dirt or primer coating	IQ \leq 78 counts/km or IRI \leq 6 m/km on dirt or primer coating
Recoverable Deflections Characteristics (Dc)	Allowable Deflection (Dadm) as a function of requesting traffic (N number estimated until the next scheduled intervention)	Admissible Deflection (Dadm) as a function of requesting traffic (N number estimated for 5 years of remaining life)
Macrotexture, sand height (HS)	0.8mm < HS < 1.3mm	0.8mm < HS < 1.3mm
Skid Resistance Value	VRD > 55	VRD > 55
International Friction Index (IFI)	IFI > 0.22 new road works	IFI > 0.22 new road works

* Surface conditions and comfort for a minimum assessment extension of 200m (two hundred meters) and a maximum of 1,000m (one thousand meters)

(1) - obtained by means of a survey through procedures DNIT 006/2003-PRO - "Purpose assessment of the surface of flexible and semi-rigid pavements"

(2) Portland cement concrete pavements

(3) unpaved roads

(4) The value to be considered will be the average of the individual irregularity measurement values in the homogeneous segment of, at most, 1000 meters, and there cannot be individual values greater than 15% (fifteen percent) of the average. If there are individual values greater than 15% (fifteen percent) of the average, the CONCESSIONAIRE will act in the sections in order to fit the kilometer into these standards.

Periodicity of the control of the minimum required parameters	From 1st to 20th	From the 21st to the 31 st
Deflectometric control	Annual	Annual
Surface inventory	Annual	Semiannually
Control of comfort conditions	Annual	Semiannually
Control of security conditions	Annual	Annual
Control of roadway noise conditions	Annual	Annual
The sidewalk monitoring reports are due no later than 45 days after the field surveys were conducted. This deadline must also be met for updating the data in GSP. Delivery dates for annual or semi-annual reports will be based on the contract anniversary date. Failure to deliver these will result in a fine, as per ANNEX 11.		

Note: There are specific parameters for the section that is part of the so-called “area of influence” (approach and departure areas) of traffic counters (SATs) and dynamic scales (SISPESMOV). Such parameters are included in the *technical specification ET-DOP-GOE-C-TRA-RNS-01/02 - Methodology for Obtaining ARTESP Traffic Parameters* (or they may be included in another ARTESP technical standard that may replace or change it during the SPONSORED CONCESSION) and, for all purposes, shall supersede the obligations established in this item.

(i) Performance curves

Based on the periodic surveys required to control the minimum parameters, a document containing the pavement performance curves expected for the remaining years of the SPONSORED CONCESSION must be presented to ARTESP.

Control of the minimum parameters required

The CONCESSIONAIRE will present the frequency of control of the minimum parameters required that it proposes during the CONCESSION TERM, however, it must comply with the deadlines in the table “Periodicity of control of the minimum parameters required”.

The pavement monitoring reports must be delivered within a maximum of 45 (forty-five) days after the field surveys are carried out. This deadline must also be met for updating the data in GSP. Delivery dates for annual or semi-annual reports will be based on the contract anniversary date.

The CONCESSIONAIRE will present the reports, in digital form, according to the standard established by ARTESP, and will feed this data into the pavement management system.

Failure to comply with the indices indicated above will cause the CONCESSIONAIRE to apply a fine in accordance with the provisions of ANNEX 11 and the CONCESSIONAIRE will be obliged to correct the sections in which the pavement indices are not in accordance with the requirements, within a period established by ARTESP. In 15 (fifteen) days after this period, the CONCESSIONAIRE will carry out a new survey to verify the pavement indexes and, if there is no agreement, an administrative sanctioning process will be initiated.

In order to verify the compliance of the services with the minimum parameters required, ARTESP will request, at the CONCESSIONAIRE's expense, regular or extraordinary audits in order to determine any disparities in compliance with the established.

Methodologies to be applied (pavement)

The premises to be applied in the special conservation of pavement are:

- i. compliance with the minimum required parameters indicated during the entire period of the SPONSORED CONCESSION;
- ii. the minimum interval between programmed interventions of 5 (five) years;
- iii. the surface of the pavement must be covered with a bituminous layer at each intervention (except for concrete pavements). The junction devices up to the limit of the road jurisdiction, as well as side roads, shoulders, scales, tolls, SAU Post, etc., are part of the surface of the pavement.

The aforementioned procedures and tests may be replaced by other equivalents during the CONCESSION TERM, in accordance with the most up to date ARTESP specifications at the time.

Special attention should be given to the surface drainage of the lanes, mainly due to the interaction with the concrete barriers, during the execution of the pavement recovery services. The pavement drains will be part of the special pavement conservation project, and must include the location of their application, cross section and hydraulic calculation memory. Pavement drains must be installed in the extensions of the highways where they have not been built, in a way that is compatible with the progress of pavement recovery, conservation or maintenance services. In the sections where they have already been implemented, the CONCESSIONAIRE must assess their sufficiency and, if they are deficient, replace or resize them. Special attention will also be given to the slopes (transversal and longitudinal) of the runway, which, eventually, must be corrected and adapted, in order to meet the minimum standards provided for in the rules in force during the SPONSORED CONCESSION.

2.2.2. Maintenance of special artworks, chains and pedestrian flyover

Description

The CONCESSIONAIRE shall comply with the current technical specification for CONTROL OF SPECIAL ART WORKS "ET-00.000.000-0-C21/002" (or another technical standard of ARTESP that may change or replace it during the SPONSORED CONCESSION) when carrying out special conservation interventions for OAEs and pedestrian flyover during the entire duration of the SPONSORED CONCESSION and the maintenance costs of these works will be fully assumed by the CONCESSIONAIRE.

The CONCESSIONAIRE shall submit a monitoring and management program containing all special

works of art and pedestrian flyover implemented within the limits of the RIGHT OF WAY within 6 (six) months from the OPERATION START DATE, to apply it throughout the CONCESSION TERM, ensuring the maintenance and adequacy of the security and functionality required according to the technical specification for the maintenance and management of OAEs "control of special works of art - ET-00.000.000-0-C21/002 - Rev. 1" of ARTESP/INSPECTION (or of another technical standard of ARTESP that may change or replace it during the SPONSORED CONCESSION). Failure to deliver this program will result in the application of a penalty, as provided for in ANNEX 11.

The CONCESSIONAIRE must comply with ABNT's current rules for structural projects, including recoveries and/or reinforcements and/or enlargements.

The CONCESSIONAIRE shall implement SISOAES. The system must provide access via the *web*. The CONCESSIONAIRE shall make user/password pairs available for use by ARTESP. The implementation must be carried out until the 1st (first) year from the OPERATION START DATE and must follow the rules established for the other electronic management systems.

The monitoring and management program must be available and updated. Your database must contain photos of recognition of the pathologies and the respective therapies performed, dated and with the specification of methodology and materials used.

The updated conditions of the OAEs and pedestrian flyover must also be presented in the monitoring and management program, with classifications of their structural, functional and durability aspects, with electronic files containing the reports of special inspections and projects that were used.

The database must be updated with additional information on implantation and expansion works, with geotechnical data and mechanical properties of the materials constituting the structures of these works, accidents and information on the passage of special loads.

The CONCESSIONAIRE must always present complete electronic files of the inspections of all OAEs with photos, including the recoveries, identifying the services and the dates of execution.

The recovery of special works of art and pedestrian flyover, to meet the monitoring plan, management and schedule of recoveries of OAEs, must address the services necessary to adapt them to the classifications of the current technical specification for "CONTROL OF SPECIAL WORKS OF ART - ET-00.000.000-0-C21/002" (or of another technical standard that may replace or change it during the SPONSORED CONCESSION), described below:

(a) Pavement

The recovery of existing pavements on the OAEs may be included in the global road pavement recovery program, provided that structurally the damage does not indicate a compromise in the safety of the work.

(b) Surface drainage

The placement or replacement of horns should be foreseen to ensure the rainwater drainage of the runway, as well as drainage upstream of the OAEs, with adequate water descents and concrete channels.

(c) Support devices and expansion joints

The CONCESSIONAIRE shall guarantee the respectability of the design parameters that fall on these parts, replacing the expansion joints whenever they are broken and/or crushed and/or blocked and the support equipment broken and/or crushed and/or distorted and relocated, if they are out of design positions. These elements must respect the parameters defined by ABNT.

Warranty repairs and replacements for these parameters must comply with the monitoring and management plan.

(d) Concrete and/or steel and/or mixed structures

The CONCESSIONAIRE shall identify all problems presented by the concrete and/or steel and/or mixed structures, respecting the current technical specification for "CONTROL OF SPECIAL WORKS OF ART - ET-00.000.000-0-C21/002" (or other ARTESP's technical standard that may change or replace it during the SPONSORED CONCESSION), applying it to OAEs, OACs and pedestrian flyover, as well as quantifying the services necessary for the recovery of these road elements, which include, among others:

- i. Treatment of cracks;
- ii. combating the action of chlorides and the state of carbonation;
- iii. treatment of exposed and/or corroded reinforcement;
- iv. treatment of disaggregated or disaggregated concrete;
- v. rehabilitation of the work to acceptable levels of deformations and displacements, according to ABNT rules;
- vi. internal drainage (in lost coffins) and external (in decks and accesses);
- vii. Insufficient horizontal gauges for the roads, which will require widening due to lack of shoulders or additional lanes due to the OAE platforms being obsolete for the traffic levels on the road;
- viii. insufficient minimum height between the maximum flood level and the lower face of the beams or slab of the superstructure, being project instruction IP-DE-C00/001 - "special work of art structure project" of DER/SP (or technical standard to change or replace it), requiring conformation of the flow section of the river bed and/or elevation of the slope for adequacy;
- ix. complete lighting of pedestrian flyover, in accordance with the specifications of this ANNEX and ANNEX 07 (both for implantation and conservation);
- x. adequacy of pedestrian flyover for people with disabilities and/or reduced mobility according to NBR 9050, or any other that may change, complement or replace it;

- xi. adequacy of OAE sidewalks that cross the highway for pedestrian crossing according to NBR 9050, or another that will change, complement or replace it.;
- xii. header of OAEs;
- xiii. elimination of a step at the meetings of the OAEs;
- xiv. implementation of rigid concrete fenders;
- xv. Structural reinforcement
- xvi. maintenance restoration;
- xvii. demolition;
- xviii. substitution;
- xix. slope re-slope;
- xx. monkeying of OAEs;
- xxi. instrumentation of OAEs;
- xxii. protective paints; and
- xxiii. access to OAEs for inspections/evaluations.

(e) Slopes of OAE meetings

The CONCESSIONAIRE shall restore the slopes of the OAEs' encounters that are eroded, implementing drainage devices upstream of the OAEs and that lead rainwater down the slope with low energy to a location that no longer interferes with them. It must also protect the slopes with concrete coatings and/or containment works that prevent erosion and/or make use of containment works in cases where it is technically necessary.

In the case of bridges, the CONCESSIONAIRE must identify the maximum flood water level to intervene with works that guarantee the stability and durability of the slopes of the encounters.

The term of the adjustments must be in accordance with the classification given to the OAE under inspection.

(f) Road containment devices

The services related to safety devices in the OAEs, including the restoration of existing guardrails and the implementation of wheel guards (current ABNT standard), must be included in the recovery services.

All OAEs with a length greater than or equal to 5.0 (five) meters must have high rigid type road restraint

devices or equivalent, provided that the relevant technical rules are met.

The rigid-type road restraint device must be implemented functioning as a wheel-guard and providing protection to pedestrians in the event of OAEs with sidewalks.

At the exit of the OAEs, the rigid-type road restraint devices must have continuity with the flexible-type road restraint devices (to approach the OAEs), and the transition must comply with the rules in force at the time of the intervention.

In existing OAEs, their implementation requires structural analyzes that must be provided.

Its deployment must be completed by the start of the operation.

(g) Type train class in OAEs for recoveries, reinforcements and/or enlargements

The CONCESSIONAIRE shall analyze the OAE class and its needs.

The choice of the most suitable type train for the OAE is based on the interventions needed (recovery, reinforcement and/or enlargement); thus, the maintenance of the class is analyzed or if it should be raised.

In order to define the type train to be adopted, the existing work must be analyzed in a specific inspection with a survey of the typology of the work, the original type train and its pathologies, focusing mainly on the structural aspects. Therefore, we can have two cases:

Work without structural pathologies

i. rebound

In this case, the work will be subjected to recovery and repairs, maintaining the type train of the work.

ii. enlargement

In the case of enlargement, the executive project must include dimensioning of the entire work for the TB-45 tf or the current type train in the ABNT standard applicable at the time of the intervention, NBR 7.188 and its revisions and alterations.

In this case, at the time of adaptation, the adaptation of the horizontal template must also be provided for, including the implementation of shoulders (width equal to or greater than the existing lane and complying with what is provided for in the current rules, as well as in other contractual provisions), in addition to pavement (longitudinal and transversal) for pedestrians, which must comply with the technical rules in force at the time of implementation.

In places where there is a forecast/need for the implementation of cycle paths, the new OAEs must include in their template the continuity of this cycle path, meeting

the technical rules in force at the time of implantation.

If this project results in the need to reinforce the existing structure and if it does not present structural pathologies, there is the possibility of defining two executive phases.

The first phase with the execution of the new part of the work, according to the project, and submitting the existing part of the work only to the recovery of repairs.

The second phase of reinforcement of the existing structure can be carried out when structural anomalies appear in it.

The executive project must clearly show in detail these two phases and the constraints of the second phase.

Works with structural pathologies

If the structural pathology requires theoretical verifications that prove the indispensability of interventions to change the shape and/or framework of structural elements, the class of the work must be raised to TB 45 or the type train specified in the applicable ABNT standard in force, both for the case of recovery, as for the case of enlargement.

In this case, at the time of adaptation, the adaptation of the horizontal template must also be provided for, including the implementation of shoulders (width equal to or greater than the existing lane and complying with what is provided for in the current rules, as well as in other contractual provisions), in addition to pavement (longitudinal and transversal) for pedestrians, which must comply with the technical rules in force at the time of implementation.

In places where there is a forecast/need for the implementation of cycle paths, the new OAEs must include in their template the continuity of this cycle path, meeting the technical rules in force at the time of implantation.

- (h) Compliance with accessibility and full citizenship rules for people with disabilities and/or reduced mobility.

The CONCESSIONAIRE is responsible for complying with accessibility and full citizenship rules for people with disabilities and/or reduced mobility in the OAEs and pedestrian flyover overpasses.

In addition to the ramps, the pedestrian flyover must also contain stairs, in order to minimize the walking of USERS who do not have mobility difficulties.

The adaptation of the existing works must be concluded by the beginning of the operation.

- (i) Screening on the pedestrian flyover to protect the USER of the highways

All existing pedestrian flyover over the highways must have galvanized metal screens.

The screen must be implanted in the main beams over the highway, extending its ends by 3.50 (three and a half) meters.

If the ramps are at a distance less than or equal to 3.50 (three and a half) meters, they must also be screened.

The screen must be durable, effective and resistant to vandalism.

On dual-lane highways, in order to prevent pedestrians and domestic animals from invading the RIGHT-OF-WAY, the pedestrian flyover must extend and have their ramps beyond the boundary walls of the RIGHT-OF-WAY.

Its implementation must be completed by the OPERATION START DATE.

(j) Lighting on pedestrian flyover for pedestrian safety

All existing pedestrian flyover must be illuminated along their entire length.

The lighting must be implanted in the screen and/or in a specific post and/or post for lighting the highway that is next to the pedestrian flyover.

Its deployment must be completed by the start of the operation.

The lighting must be implemented in such a way as to enable the USER to view the opposite end of the pedestrian flyover, as specified in ANNEX 07, and in accordance with current ABNT rules.

(k) Implementation of flexible road containment devices in OAEs

All OAEs with a length of less than 5 (five) meters may have flexible road containment devices pursuant to ANNEX 07.

Such provisions are the same as those provided for in the approach of OAEs and will continue on the OAE. Its fixation cannot compromise the durability of the OAEs' armor.

Its deployment must be completed by the start of the operation.

(l) Implementation of rigid road restraint device in OAEs

Rigid road restraint devices will be implemented in the OAEs, according to the rules in force at the time of implementation.

The pillars of all OAEs of the ROAD SYSTEM must be protected by rigid road containment devices, to an extent and distance that there is no danger of the pillar being impacted by a vehicle, as established by current ABNT rules.

Its deployment must be completed by the start of the operation.

(m) Technical recognition inspections of OAEs

The CONCESSIONAIRE shall carry out inspections in the OAEs with specialists, identifying the necessary interventions to adapt to the classifications of ET-00,000,000-0-C21/002 revision 1, (control of special works of art) or of another technical standard of ARTESP that may come to change or replace it during the SPONSORED CONCESSION, under the structural, functional and durability aspects, and to ABNT's current rules. Representative photos of the pathological manifestations and other anomalies of the works must be presented.

The CONCESSIONAIRE shall provide for interventions and special conservation in the OAEs and pedestrian flyover for the entire duration of the SPONSORED CONCESSION.

The CONCESSIONAIRE shall deliver a recovery schedule identifying all OAEs and pedestrian flyover, focusing on the classifications according to said ET (technical specification) or ARTESP's technical standard that may change or replace it during the SPONSORED CONCESSION, under the structural aspects, functional and durability, with the breakdown of pathological manifestations and intervention services necessary for the adaptations of the works.

(n) Transit of freight vehicle combinations - CVCs in OAEs

The CONCESSIONAIRE must be aware of the universe of OAEs and the respective traffic that operate in them to assess their needs and commitments, analyzing their state of conservation and adapting them to the traffic of freight vehicles on the highway. That is, through research and updated technical inspections in the OAEs, structural calculation verifications and interventions for the use of CVCs, all structural systems, pathologies and active CVCs must be identified.

It is not appropriate to sample some works on the stretch of a highway.

Special conservation must guarantee compatibility with CVCs, respecting the safety coefficients standardized for OAEs, preventing damage to them.

(o) Transposition of super-heavy special cargo in OAEs

The CONCESSIONAIRE must be aware of the universe of OAEs and the respective traffic that operate in them to assess their needs and commitments, analyzing their state of conservation and adapting them to the traffic of freight vehicles on the highway. Through updated researches and technical inspections of the OAEs, structural calculation checks, and interventions for the use of super-heavy special loads, all structural systems, pathologies, and active PBTs should be identified.

It is not appropriate to sample some works on the stretch of a highway.

Special conservation must ensure compatibility between special super-heavy loads, respecting the safety coefficients standardized for OAEs, preventing damage to them.

(p) Pipes for tributary collectors in OAEs

The CONCESSIONAIRE shall maintain the effluent capture system supported by the superstructures of the OAEs in adequate operating conditions.

(q) Adaptation of the horizontal template of the OAEs

Existing OAEs must have their appropriate horizontal templates. If any OAE does not meet this requirement, the adequacy of its horizontal template should be foreseen.

The adequacy must be foreseen for up to 2 (two) years.

2.2.3. Road containment devicesDescription

They are elements or systems intended to reduce the severity of accidents, prevent the passage of vehicles, pedestrians or both in dangerous areas or places, as well as reduce noise levels. They are: containment devices, metal fenders, concrete barriers, anti-glare devices, point containment devices, impact-absorbing devices, acoustic barriers and others.

The CONCESSIONAIRE shall estimate the quantities of necessary and sufficient services related to the implementation of road containment devices in accordance with ANNEX 07.

The CONCESSIONAIRE, throughout the CONCESSION TERM, shall assess the need and arrange for the implementation, modification or removal of these road restraint devices in other locations, at its own expense.

Execution Patterns

The projects, implementation, replacement, restoration, recovery and reinforcement of road containment devices must comply with the relevant technical rules, in force at the time of the intervention and in accordance with ANNEX 07.

Special care with surface drainage should be taken in cases of implementation of rigid road containment devices (eg concrete barriers).

In stretches under construction, the work area must be protected with road containment devices, to be implemented in accordance with the technical rules in force at the time of the intervention.

2.2.4. Signaling and Auxiliary DevicesDescription

It is the set of traffic signs and other elements placed on the public road in order to ensure its proper use, enabling better traffic flow and greater safety for vehicles and pedestrians that circulate on it.

Traffic signs are elements of road signage, among which can be mentioned: signs, road markings, lighting control equipment, auxiliary devices, whistles and gestures intended exclusively to order or direct the traffic of vehicles and pedestrians.

Auxiliary devices, for the purposes of this SPONSORED CONCESSION, are the elements applied to

the pavement of the road or next to it, in order to make the road operation safer. They are: the delimiting devices (tacks, studs, beacons, delimiting cylinders and delineators), the plumbing devices (prisms and segregators), the warning signaling devices (obstacle markers, danger markers and alignment markers) and the temporary use devices (cones, cylinders, mobile beacons, drums, striped tape, easels, fixed and mobile barriers, fences, railings, complementary luminous elements, flags, banners).

Execution Patterns

The defined standards must be met throughout the CONCESSION TERM.

(a) Traffic markings, boundary devices and plumbing devices

The horizontal signaling of delimiting devices and channeling devices must comply with the standards and specifications in force in the Brazilian Traffic Signaling Manual - CONTRAN, in the Road Signaling Manual - DER/SP and in the relevant and current ABNT technical rules, in addition to the Manual of Institutional Signage and other technical specifications of ARTESP in force and/or issued during the SPONSORED CONCESSION.

In the sections in pavement rehabilitation works, immediately after intervention in the pavement layer of the subsections of the work and before the release to traffic, provisional horizontal signaling adequate to safety standards must be maintained or implanted, with the same geometric and qualitative characteristics of the signaling definitive, according to the DER/SP Road Signaling Manual or another that may replace or complement it. In accordance with the provisions of Article 88 of the Brazilian Traffic Code, after 30 (thirty) days of intervention in the pavement layer, the sub-sections of the work must be signaled with the definitive horizontal signaling and placement of reflective tacks -, in accordance with what included in the EXECUTIVE PROJECT for signage for the location.

At ARTESP's discretion, at the Concessionaire's expense, the implementation of a solution that allows better visibility of the horizontal signage, with a function similar to the retro-reflective tack, may be requested, while the latter is not installed, not exceeding a period of 30 days, mentioned in the previous paragraph.

(b) Vertical signaling (ground and aerial) and warning signaling devices

Traffic signs and warning signaling devices must meet the standards and specifications in force in the Brazilian Traffic Signaling Manual - CONTRAN, in the Road Signaling Manual - DER/SP, in the Institutional Signaling Manual and other technical specifications of ARTESP and in the rules relevant ABNT techniques in force during the SPONSORED CONCESSION.

(c) Temporary Use Devices

The use of temporary devices is mainly aimed at complementing the signaling of works and emergency traffic detours. Due to the importance in ensuring traffic safety, its use must comply with the rules, standards and specifications in force in the Brazilian traffic signaling manual — Contran, in the road signaling manual — DER/SP, technical specifications of ARTESP and the technical rules of relevant and in force during the SPONSORED CONCESSION. The preparation and presentation of executive projects for signaling works and traffic deviations must comply with the provisions of APPENDIX G.

For stretches under construction, the signaling (vertical signaling, warning signaling devices and temporary use devices) must be implemented in accordance with the Brazilian Traffic Signaling Manual — Contran, in the Road Signaling Manual — DER/SP, specifications ARTESP techniques and contained in the Brazilian traffic code – CTB.

In the case of the use of easels as supports for the installation of temporary vertical signs, it will only be allowed to use models that fix the sign in the appropriate vertical position.

For routine conservation works, the presentation of a certified executive project will not be mandatory, and the CONCESSIONAIRE shall submit the relevant documentation for analysis by ARTESP within 30 (thirty) days before the start of the work.

2.2.5. Slope Monitoring

The CONCESSIONAIRE shall carry out technical inspections and deliver a consolidated technical report every 2 years, starting in the second year from the START OF OPERATION DATE, and including, in said documents, all cut and fill slopes with a height greater than 2 (two) meters.

In this inspection, the physical characteristics of the slope must be identified, such as geometry, soil characteristics, drainage, etc. The inspection report must contain for each of the highway slopes:

- i. sheet of geometric characteristics of the slope with photographic records;
- ii. design of the slope, in plan and elevation, including the type of vegetation cover, the drainage elements and possible containments (gabions, etc.);
- iii. estimation of slope safety factor for slopes with non-standard geometry: 1:1.5 (H:V) for cuts or 1:1 (H:V) for fills; or for slopes with a history of landslides; or even for slopes that present instability characteristics (presence of cracks in the massif, small or large erosion, etc.);
- iv. from the inspections, a schedule of interventions on slopes that are outside the normative standards or that represent risk or danger to users must be established;
- v. the information obtained in the surveys must be registered and updated in the relevant digital management systems provided for in the SPONSORED CONCESSION (SIR), as well as in the Digital Model of the Road System (MDSR) and in SIGGIS, as required by ARTESP.

For this obligation, at each monitoring, a budget must be provided for surveys and tests, contemplating at least: 10 (ten) percussion surveys; 5 (five) inspection wells with sample collection; 5 (five) auger soundings with sample collection; 10 (ten) mixed or rotating soundings; 10 (ten) direct shear or shear failure tests in triaxial equipment.

In the event that the slope monitoring report points out the need for mitigating measures, such as: vegetation cover, installation of drains, use of geomats, those indicated in the routine conservation obligations, among others, the adjustments must be carried out by the Concessionaire, at your own expense.

If the slope monitoring report indicates the proven insufficiency of mitigating measures through routine conservation obligations and the slope monitoring report indicates the need to implement containment or re-slope works, the works that may be necessary to adapt the containment or rebalance will be rebalanced, to the exact extent of the proven imbalance. The rules provided for in the AGREEMENT for ORDINARY REVISION must be followed, except for cases in which the stability problem results from design, constructive, maintenance failures and/or defects or arising from other risks attributed to the CONCESSIONAIRE, in the latter In this case, the works must be carried out at the CONCESSIONAIRE's expense.

2.3. Supervision

(a) General Provisions

Each special conservation/maintenance service will be the object of a specific project, prepared by the concessionaire, in compliance with specific rules and guidelines, which must be submitted for approval by ARTESP.

The CONCESSIONAIRE shall establish a program of supervision, monitoring of execution, technological and quality control of services. The costs of developing and implementing the supervision program will be borne by the CONCESSIONAIRE.

The CONCESSIONAIRE shall justify, in writing, any delays in the beginning and end of the work, including if there is a delay in the fulfillment of intermediate milestones presented in the current INVESTMENT PLAN, without prejudice to the analysis and validation by ARTESP on the merits.

The inspection will carry out acceptance inspections of the services performed by the CONCESSIONAIRE in adaptations, recoveries, reinforcements, modifications and/or replacements of OAEs, as well as inspect their management.

In case of divergence of compliance with the required parameters, ARTESP will request, at the CONCESSIONAIRE's expense, regular or extraordinary audits, including tests provided for in the current technical specification for "CONTROL OF SPECIAL WORKS OF ART - ET-00.000.000-0-C21 /002" (or ARTESP's technical standard that may change or replace it during the SPONSORED CONCESSION), for data complementation for evaluation of the state of the work, in order to determine any disparities in compliance with the established.

(b) Works Quality Certification

The CONCESSIONAIRE shall obtain a Works Quality Certificate for all the works provided for in the SPONSORED CONCESSION, under the terms and deadlines of APPENDIX G.

(c) Works Quality Control Management

The CONCESSIONAIRE shall implement and operate an Integrated Digital System for the Management of Technological and Quality Control of Works (SISQUALI), under the terms and deadlines of APPENDIX F.

The quality control information must be fed into the system, concomitantly with the progress of the works.

(d) Monitoring of Works Using BIM Technology

The CONCESSIONAIRE shall enter information regarding the monitoring of the works in an appropriate BIM model, under the terms and deadlines set out in APPENDIX G.

(e) Conclusion

Once the POI and the respective Physical-Executive Schedules have been approved by ARTESP, the dates for completion of each service/investment item must be met by the CONCESSIONAIRE. Failure by the CONCESSIONAIRE to comply with the Physical-Executive Schedule, or the delay in complying with these dates, stages, segments and milestones will subject the CONCESSIONAIRE to the penalties provided for in the REQUEST FOR BIDS, in the AGREEMENT and its ANNEXES. The Concessionaire shall issue a Notice of Completion, in accordance with the terms and deadlines set forth in APPENDIX G.

(f) "As Built" Documentation

The CONCESSIONAIRE shall submit *As Built* documentation for all works provided for in the SPONSORED CONCESSION, under the terms and deadlines of APPENDIX G.

3. EMERGENCY CONSERVATION / MAINTENANCE**3.1. Basic principles**

Emergency conservation/maintenance is defined as the services or works necessary to adapt, repair, replace, rebuild or restore sections or structures of the highway that have been sectioned, obstructed or damaged by an extraordinary event, of public calamity, causing partial or total interruption of road traffic.

Such an event may be a slope slide, an embankment slide, flood, fire in the RIGHT-OF-WAY, traffic accident, damage to a special artwork, etc.

The conservation/maintenance standards indicated in this item will apply to all elements and devices located within the limits of the RIGHT-OF-WAY, including side roads, device loops, bike paths and others.

The need to present executive projects for this item will be at ARTESP's discretion. If the Agency determines the need to present executive projects for these items, the standards to be followed will be the same standards defined in APPENDIX G, except in cases where there is express authorization from ARTESP to waive one or more contractual obligations.

3.2. Procedures

In the event of an emergency event, the CONCESSIONAIRE shall, as a priority:

- i. install adequate traffic signaling at the location, according to the provisions of the DER/SP signaling manual or other manuals that may be adopted by ARTESP (in force at the time of the occurrence);

- ii. when there is a need to implement a traffic diversion, it must be properly signaled in its entirety, according to the provisions of the DER/SP signaling manual or other manuals that may be adopted by ARTESP (in force at the time of the occurrence);
- iii. proceed with the immediate mobilization of resources for the necessary corrective action;
- iv. immediately report the event to ARTESP; and
- v. in the case of immediate technical actions in OAEs, OACs and pedestrian flyover, the current technical specification for "CONTROL OF SPECIAL WORKS OF ART - ET-00.000.000-0-C21 / 002" (or ARTESP's technical standard that may change or replace it during the SPONSORED CONCESSION).

3.3. Supervision

Emergency conservation/maintenance services will be the subject of specific reports by the CONCESSIONAIRE and must contain at least the following:

- i. the precise location of the emergency event (road, kilometer, lane, municipality);
- ii. date and time of the event;
- iii. the type of emergency occurrence (fall of barrier or cut slope, flood);
- iv. the type of interdiction (total, partial, shoulder, cloverleaf loop);
- v. the emergency measures adopted (signaling the place, detours carried out, including a map, sketch of the detour route, resources mobilized, etc.);
- vi. preliminary assessment of the causes of the event;
- vii. preliminary planning to correct the damage, including the expected date for re-establishment of normal traffic on the road;
- viii. future programming within routine or special conservation programs; and
- ix. photographic report of the emergency event, deviations and signaling, etc.

The emergency report must be submitted to ARTESP within a maximum of 24 (twenty-four) hours after the occurrence of the event, by electronic means, and must be updated weekly until the (total or partial) traffic ban is released, and the services the remaining ones followed up by means of special or routine conservation, as the case may be.

4. SERVICES CORRESPONDING TO THE ENVIRONMENT, HEALTH AND OCCUPATIONAL SAFETY

4.1. Environmental initial program

The CONCESSIONAIRE, before starting the ROAD SYSTEM operation, must prove to ARTESP the complete resolution / mitigation (or initiated when justifiable) of all Environmental Liabilities of the ROAD SYSTEM IMPLEMENTATION WORKS. The cases of Environmental Liabilities of Works not resolved before the start of the operation will be considered for the purposes of the CSP.

Environmental non-conformities identified after the start of commercial operation will not constitute environmental liabilities and will follow the recovery rites and deadlines established in the Environmental Performance Assessment (ADA) or methodology that may replace it.

All responsibility related to the implementation and execution of all environmental programs of the operation stage will be the responsibility of the CONCESSIONAIRE, which must perform, at its own expense, the necessary activities.

The CONCESSIONAIRE will be responsible for the implementation and funding of all studies, construction and adaptation of structures for fauna passages (lower and upper) provided for in APPENDIX B.

The CONCESSIONAIRE, throughout the ROAD SYSTEM, must carry out and pay for itself annually, studies to identify "hotspots" of road kills by wild fauna and implement measures to mitigate pedestrian accidents. Once a "hotspot" not provided for in the EVTE is identified, the studies carried out by the CONCESSIONAIRE will be submitted for approval by ARTESP, through their insertion in SISDEMANDA for processing in the ORDINARY or EXTRAORDINARY REVISIONS, as the case may be. In conjunction with the studies, the CONCESSIONAIRE shall present projects and the respective budget, containing an indication of the costs necessary for the implementation, operation and conservation of this Expansion, indicating the exact measure of the eventual imbalance of the economic-financial balance of the CONCESSION AGREEMENT.

To this end, the methodology of IBAMA's Normative Instruction No. 13/2013 can be used. These surveys of "hotspots" must consider the results of the survey of fauna run over, as requested by CETESB (DD.141/2018/I of CETESB). The annual period refers to the need to cover all seasonal cycles.

In all existing "hotspots" throughout the road system, educational boards with images of animals that occur in the surrounding environment should be implanted. The plates must be approved by the Contracting party's responsible areas. The studies, projects and costs of eventual alterations in the geometry and current works of art of the existing tracks, as well as the implantation of special works of art, fauna passages etc., to guarantee the gene flow of fauna and flora, will also be of total responsibility of the CONCESSIONAIRE. The fauna passages to be implemented must consider, in addition to the "hotspots", the type, size and degree of threat of the fauna occurring in the region. In places where arboreal species (such as primates) occur, air passages must be provided. Fauna passages (lower or upper) must be implemented in conjunction with guidance fences. The fences must follow the DNIT 077/2006/ES Rule – "Live fence or screen for the protection of the fauna". The fences must have a buried part (in order to prevent the passage of excavating fauna), a screen with a minimum height of 2

meters above the ground, a mesh with a smaller opening in the part close to the surface (avoiding the passage of smaller animals) and guides at the ends. Technological alternatives of guiding fences may be used, as long as they are previously approved by CETESB.

The steering fences must have a minimum extension of 200 m on each side of the fauna passage, in the two lanes of the highway. In fencing projects, the occurrence of water courses and fragments of native vegetation must be considered in order to connect them to the landscape. In the case of an interface between fences and access to neighboring properties, halters must be implemented.

The CONCESSIONAIRE, throughout the ROAD SYSTEM, must carry out and pay for itself annually, studies to identify “hotspots” of road kills by wild fauna and implement measures to mitigate pedestrian accidents. At critical points in rural areas, mitigating measures must include the implementation of fences, gates, cattle guards and cattle crossings, as well as raising the awareness of landowners about responsible ownership. The CONCESSIONAIRE shall annually develop educational and awareness campaigns with USERS, employees and providers and neighbors regarding the need to safeguard animal life.

In addition, the CONCESSIONAIRE shall, as applicable, within the scope of environmental licensing processes, assess the effects that may be caused on wild fauna as a result of the installation of a lighting system, in the stretches of highway that intersect the Conservation Unit. In addition, if the need is identified within the scope of this study, in these sections the installation of the system must be carried out by means of underground wiring.

All waterproofed areas, already deactivated or that will be deactivated, such as stretches of track, access loops, access to third parties (determined by the GOVERNMENT) etc., must be removed and recovered by the CONCESSIONAIRE, which will bear all costs arising from this activity. The recovery of these areas must reach, at least, the depth of the layer with drainage material, being, later, leveled with soil and finished with the recomposition of the vegetation cover. Areas deactivated after the start of the operation must be removed within 6 (six) months or until the completion of the respective schedule of works or other services, except in cases where the sections continue to be used.

The CONCESSIONAIRE shall ensure that, during the elaboration of the Engineering project for capacity expansion works, engineering solutions are studied to reduce damage (erosion and silting) at points where the storm drain exit has the potential to affect the neighboring properties and water bodies. The eventual adoption of expansion of the right of way for the implantation of devices for the retention and/or accumulation of rainwater (example: basins) must be considered.

The CONCESSIONAIRE shall, as a condition for completion of the PRE-CONSTRUCTION PERIOD, prepare and implement an Environmental and Social Management System (SGAS) in line with IFC's PS1 and ISO rules 14.001, 14.004 and 45001, obtaining ISO 14.001, 14004 certifications and 45,001 within the period indicated in item 5.

4.2. Liabilities

4.2.1. from ARTESP

In relation to the services corresponding to the Environment, ARTESP:

- i. will provide assistance, when requested, to the understandings with the competent bodies in matters related to environmental licensing and other approvals and authorizations that may be necessary;
- ii. assessment the:
 - a) the mandatory environmental audit report, carried out at least annually in the CONCESSIONAIRE's integrated environmental and social management system. The contracting of the mandatory audit and its respective costs are attributions of the CONCESSIONAIRE;
 - b) the independent environmental and social audit report, carried out, at least, every six months in the first 3 (three) years and, annually, in the remaining term of the SPONSORED CONCESSION, referring to the obligations contained in item b of this ANNEX. The contracting of the independent external audit, with proven qualification with the evaluation of the PERFORMANCE STANDARDS, and their respective costs are attributions of the CONCESSIONAIRE; and
- iii. monthly, the CONCESSIONAIRE's environmental performance through the ADA – Environmental Performance Assessment or methodology that may replace it; and
- iv. shall notify the CONCESSIONAIRE regarding compliance with any recommendations provided for in the reports, under penalty of application of the penalty provided for in ANNEX 11.

4.2.2. FROM THE CONCESSIONAIRE

In addition to the obligations provided for in the AGREEMENT and in this ANNEX and in the applicable legislation, the CONCESSIONAIRE shall:

- a.1. Prepare and present to ARTESP in the form and frequency in which you have:
 - i. complete copy of all environmental licenses and authorizations, including the respective technical opinions, and other documents that may be requested by the CONTRACTING PARTY;
 - ii. copy of all notifications of environmental and administrative infractions, as well as any fines resulting from these infractions;
 - iii. copy of all notifications of occupational health and safety and administrative infractions, as well as any fines resulting from these infractions;
 - iv. annual health, safety and environment performance assessment report – RADA, structured based on NBR ISO 14,031 and 45,001;

- v. copy of the Certificates of implementation / renewal of the Environmental and Social Management System based on ISO 14,001, ISO 45,001 and PS1;
- vi. independent environmental and social audit report, evidencing compliance with the requirements set out in the PERFORMANCE STANDARDS, with a semi-annual frequency in the first 3 (three) years and, annually, in the remaining term of the SPONSORED CONCESSION;
- vii. Recycling programs should be a priority.
- viii. annual inventory of greenhouse gas emissions and proof of neutralization of emissions resulting from the ROAD SYSTEM operating services, in accordance with the provisions of ANNEX 05.

a.2. Make the reports and information provided for in the previous sub-item available in digital media, in real time and with unrestricted access to ARTESP.

a.3. Give immediate knowledge:

- i. of any and all environmental events that may harm or prevent the punctual and timely fulfillment of contractual obligations and that may constitute a cause of intervention or forfeiture of the SPONSORED CONCESSION or termination of the AGREEMENT; and
- ii. of any and all situations that correspond to facts of an environmental nature that significantly alter the normal development of the services or the exploration of the SPONSORED CONCESSION, submitting, in writing, and within the minimum period necessary, a detailed report on these facts, including, if applicable where applicable, contribution from technicians or specialized entities, external to the CONCESSIONAIRE, with the measures taken or in progress to overcome or remedy the aforementioned facts.

b. When performing the services:

b.1. Maintain, throughout the CONCESSION TERM, Adequate Service conditions and methodology that guarantee environmental and social preservation and avoid environmental and social impacts for all services under its responsibility, also being its responsibility to carry out the mitigation of environmental impacts and/or environmental liabilities of the survey provided for in ANNEX 18, without prejudice to the contractually provided risk allocation.

b.2. Prepare all environmental and social studies, in accordance with the applicable requirements of IFC PS1 (paragraphs 7-12), in line with studies previously prepared within the scope of environmental licensing processes and obtain and maintain all licenses (LP, LI and LO) and environmental permits, grants, etc., necessary for the start and continuity of the ROAD SYSTEM operation. In order to obtain the aforementioned environmental licenses and authorizations, the CONCESSIONAIRE must comply with the deadlines provided for in current legislation. Any and all additional requests from environmental

licensing bodies must be met within a maximum of 30 (thirty) days. The alteration of this period must be authorized by Organs environmental agencies and/or by ARTESP.

Bear all costs related to studies and licensing/authorization fees under its responsibility, implementing all measures and investments necessary to meet the requirements, within deadlines and values established by Organs competent bodies and by ARTESP, observing the risk matrix of the AGREEMENT.

Submit to ARTESP all landscaping projects to be implemented in the system. In the elaboration of these projects, native and regional plant species must be prioritized, and road safety rules must be observed in projects within the RIGHT OF WAY (free zone). Forest compensation projects due to capacity expansion works should prioritize recovery in intercepted Conservation Units or in the vicinity of the Lot.

b.3. Follow the guidelines of the Biodiversity Management Plans (including monitoring) and the Biodiversity Action Plan, to be implemented according to the results of the FINAL INSPECTION REPORT, prepared according to the guidelines indicated in ANNEX 18.

b.4. Meet the criteria and requirements defined through the ADA - Environmental Performance Assessment, or methodology that may replace it during the SPONSORED CONCESSION.

Implement the project's Environmental and Social Management Plan (ESMP) (both for construction activities and for operation and maintenance activities) in accordance with paragraphs 13 to 16 of IFC PS1, including measures to prevent, mitigate, monitor and offset environmental and social impacts throughout the concession's useful life, subject to the provisions of ANNEX 18. Environmental and Social Management Plan reports must be submitted at intervals not exceeding monthly during the CONSTRUCTION PERIOD. After the CONSTRUCTION PERIOD, the periodicity of the reports may be increased to annual, so that it can be subject to an independent social and environmental audit.

It will be up to the CONCESSIONAIRE, within the period indicated in item 5, to implement and operate the SGAS, to meet the following minimum requirements of PS1:

- i. Definition of the organizational structure of the CONCESSIONAIRE's socio-environmental area, in accordance with paragraphs 17 to 19 of PS1;
- ii. Preparation of the CONCESSION's Socio-environmental Policy, which defines the environmental and social purposes and principles that guide the project to achieve solid socio-environmental performance, in accordance with paragraph 6 of PS1. The policy must be widely disseminated at all levels of the CONCESSIONAIRE's organizational structure;
- iii. Elaboration and implementation of a procedure for the assessment of environmental and social risks and impacts of capacity improvement and expansion works and respective management actions and programs, in accordance with paragraphs 7 to 12 of PS1. Among the studies to be developed/updated by the CONCESSIONAIRE, among other topics, as applicable: hydrology and geotechnics, social impacts due to the acquisition of new areas by the project, construction and operation activities,

including the need for expropriation and/or resettlement, dust and gas emissions, traffic during construction and operation, safety, environmental noise during construction and operation of sensitive receptors, impacts on biodiversity, with a special focus on natural and critical habitats;

- iv. Definition of the main socio-environmental indicators (based on the identification of socio-environmental risks and impacts in accordance with PS1) and the respective socio-environmental goals;
 - v. Review and supplementation of Environmental and Social Management Programs previously defined in environmental licensing processes in light of the requirements of paragraphs 13 to 16 and 20 to 24 of PS1 and based on the results of updated studies to identify and assess impacts in accordance with the PS1 and implementation throughout the concession period;
 - vi. Identification and Assessment of Stakeholders and development and implementation of an Engagement Plan with Stakeholders, and definition of consultation and disclosure procedures, with a focus on affected communities, and development and implementation of external grievance mechanisms, in accordance with paragraphs 25 to 36 of PS1;
 - vii. Schedule of training and implementation of the SGAS, in order to reach its operationalization for the conclusion of the PRE-CONSTRUCTION PERIOD.
- b.5. Submit six-monthly monitoring reports to ARTESP during the first 3 (three) years from the AGREEMENT SIGNATURE DATE and annual reports after this period, demonstrating that all projects developed during the SPONSORED CONCESSION, as well as the construction, operation and conservation of the system, comply with the requirements of Brazilian legislation and with the PERFORMANCE STANDARDS. To this end, the CONCESSIONAIRE shall hire, at its own expense, an independent environmental and social audit to monitor and measure the effectiveness of the Company's Environmental and Social Management Programs. CONCESSIONAIRE required in the AGREEMENT, compliance with legal, regulatory and contractual obligations.
- b.6. Present, annually, a Report to the Affected Communities, addressing the results of the monitoring of the key socio-environmental indicators of the SGAS, as well as any plans to expand the capacity or any works and services that may generate socio-environmental impacts.
- b.7. Occupational Health and Safety management is an integral part of the SGAS and must include in its scope the service providers and suppliers that perform activities in the ROAD SYSTEM, even if the subcontractors and/or partners or partners of the CONCESSIONAIRE are not part of the scope of the SGAS. Among other obligations, the CONCESSIONAIRE must develop specific procedures to prevent and manage health risks caused by health crises, such as COVID-19, in the workplace, including an Emergency Preparedness and Response Plan.
- b.8. Within the scope of the SGAS, the CONCESSIONAIRE shall prepare, implement and

maintain a Human Resources Policy compatible with PS2, especially paragraphs 8, 9 and 15, which include, among others, establishing formal guidelines and implementing:

- i. code of conduct for workers and outsourced workers, without prejudice to the provisions of the AGREEMENT, based on ethical principles, including the promotion of diversity, inclusion and awareness of discriminatory or violent practices inside and outside the work environment;
 - ii. training and qualification of the workforce, including outsourced workers, regarding policies and procedures, including programs and actions to raise awareness of issues of violence, including gender, diversity and inclusion, in line with the code of conduct;
 - iii. human resource management procedures to assess participation in the workforce, including that related to gender, in addition to valuing diversity and promoting equal opportunities; and
 - iv. consultation mechanisms, complaints and complaints by workers, including outsourced workers, duly disclosed and that guarantee broad access and anonymity, including, but not limited to, practices of discrimination, violence, moral, physical or sexual harassment, including when based on gender .
- b.9. In the event of any need to conduct relocation processes for homes, businesses or any other type of occupation or irregular activity in the current RIGHT-OF-WAY, this process must comply with legal requirements and procedural protections consistent with the International Conventions on Human Rights, as well as provided in PS5 and corresponding guidance notes, considering the following measures:
- i. registration of occupations with socioeconomic profile;
 - ii. definition of indemnity, compensatory, and/or assistance measures (consistent with IFC PS5 requirements);
 - iii. proof of creation and management of a direct and permanent communication channel with the representative of the occupation/activity to be reallocated from the RIGHT-OF-WAY;
 - iv. descriptive report of the follow-up actions of the lane reallocation process and execution of the indemnity and/or assistance measures initially agreed upon;
 - v. report describing the situation of the affected people after completion of the relocation process and termination of compensation and/or assistance measures.
- b.10. Within the scope of the SGAS, develop and implement a management procedure applicable in the event of identification of traces related to cultural, archaeological and paleontological heritage, in accordance with the requirements of PS8.

c. When operating the ROAD SYSTEM:

- c.1. Request an operating license for the ROAD SYSTEM, according to the procedure to be determined by the environmental agency. The CONCESSIONAIRE shall bear all costs related to this requirement, as well as those related to the implementation of the measures and investments necessary to meet the requirements of Organs competent bodies, observing the risk matrix of the AGREEMENT.
- c.2. Manage potential risks during the operation of the ROAD SYSTEM. To this end, you must previously develop a Risk Analysis Study in order to identify, analyze and evaluate the risks involved, knowing the different types of adverse events that may occur, as well as their possible associated consequences, which can cause harm to people. (employees, users, neighbors, providers, road operators, etc.), property (private and public) and the environment.

This step, prior to risk management, called risk analysis and assessment, should include, at least:

- i. identification of hazards (accidents likely to occur);
- ii. estimating the frequency of occurrence of hazards (accidents);
- iii. estimation of potential consequences of possible accidents and estimation of different levels of risk (combination of frequencies of occurrence and different levels of severity resulting from the consequences);
- iv. considerations on the hazard or on existing control systems/measures and any recommendations to be implemented to reduce or control the risk;
- v. it is recommended that, for the development of this activity, the *Preliminary Hazards Analysis* (PHA) technique is used, which is a technique widely used in Risk Analysis Studies (EARs). Also, in the identification of hazards, hypotheses of accidents that have the potential to paralyze the operation, even if partially (limited time), of material damage to equipment, facilities or public or third-party property, of damage to physical integrity employees, traffic operators or third parties and environmental impacts (acute or chronic), including accidental events that imply water, air and/or soil pollution;
- vi. the events must consider, among others, undesired situations on the highway and in operational and administrative facilities, such as:
 - Traffic-accidents;
 - Accidents involving dangerous goods;
 - Spills or leaks of products into bodies of water;
 - Extreme weather events (mists, heavy rains, floods, winds, etc.);
 - Slip/land slide/barrier falls;

- Contamination of soil and groundwater;
- Explosions;
- Fires.

The final report of the Risk Analysis Study must be presented to ARTESP within 12 (twelve) months from the OPERATION START DATE, including at least the following scope:

- i. introduction and purpose;
- ii. description of facilities, equipment and activities;
- iii. Preliminary Hazard Analysis (PHA);
- iv. results, conclusions and recommendations;
- v. Action plan and implementation schedule of risk mitigation measures;
- vi. responsible technical team.

Based on the results of the analysis and risk assessment, thematic Programs and Plans should be prepared, such as, for example, the PGR for the transport of dangerous products, the User Safety Plan, the Accident Reduction Program - PRA, the of Road Safety Communication, the Road Safety Management System, among others, and the respective Emergency Action Plans, when applicable, such as the PAE for accidents with dangerous products, the Fire Action Plan, in which they must be responsibilities, guidelines and information are defined, aiming at the adoption of structured technical and administrative procedures, in order to provide quick and efficient responses in emergency situations.

c.3. Develop, approve at the competent body and implement the Risk Management Program (PGR) and the Emergency Action Plan (PAE) for the transport of dangerous products, in accordance with current environmental legislation (currently SMA Resolution No. 70, of June 11, 2018 and Board Decision No. 70/2016/C, of April 12, 2016), for the entire system in operation, bearing all the costs necessary for the implementation of said plan. The CONCESSIONAIRE will also be responsible for reviewing the existing PGR / PAE, being responsible for implementing mitigation measures such as, for example, measures to reduce the frequency of accidents and their socio-environmental consequences, containment systems in stretches critical, among others resulting from the studies and/or requested by CETESB. In cases in which the need to expropriate additional areas for the implementation of these measures is verified, the Concessionaire must forward subsidies (studies, documents and justifications) to ARTESP to support the expropriation process.

c.4. Comply with the provisions contained in the legislation in force and in the conditions of licenses related to noise prevention and mitigation measures resulting from the operation of the system and/or the performance of services / works. In the event of environmental problems caused by harmful noise to the communities bordering the granted system, the

CONCESSIONAIRE will bear all costs related to the specific surveys and studies of noise levels required by Organs competent bodies or by the CONTRACTING PARTY. The CONCESSIONAIRE will also be obliged to take all the measures established by the aforementioned specific studies, at its own expense and within the deadlines required by Organs competent bodies and by ARTESP, depending on the size of the inconveniences brought to the affected communities.

- c.5. Prevent, reduce, compensate and monitor socio-environmental risks and impacts during the ROAD SYSTEM operation, until the end of the CONCESSION period. To this end, the respective Environmental and Social Management Programs and the SGAS must be periodically reviewed.
- c.6. Proactively carry out periodic inspections in order to detect environmental, social and occupational health and safety non-conformities in the RIGHT-OF-WAY and correct them immediately, complying with contractual and legal requirements, as well as carrying out said inspections in the Area of Direct Influence, forwarding the results to ARTESP.
- c.7. Present, as a condition to the start of the FULL COMMERCIAL OPERATION or PARTIAL COMMERCIAL OPERATION, if applicable, the Fire Action Plan, including:
 - i. The mapping of risk areas for fires along the highways, based on the characteristics of land use and occupation and on the history of occurrences, and other complementary information, with the purpose of identifying points with high potential for fire occurrence, as well as of high vulnerability, in and around the SPONSORED CONCESSION's RIGHT OF WAY, such as Conservation Units, significant forest fragments, plantations (eucalyptus and sugar cane, for example), presence of communities bordering the highway, etc.). This mapping should contribute to assist the CONCESSIONAIRE in prioritizing fire prevention and firefighting actions, minimizing these risks;
 - ii. The establishment of procedures that allow the CONCESSIONAIRE to reduce the response time between the activation and the beginning of the fight and increase the proportion of service in relation to the total number of fires set off;
 - iii. The Plan may provide for partnerships with rural properties around the road Lot, in order to guarantee the maintenance of firebreaks;
 - iv. Prevention can also be addressed through educational campaigns for users and adequate maintenance of vegetation in the right-of-way.
- c.8. Know, promote, comply with and enforce the legal and normative determinations and requirements of PS2 related to health and safety at work, as well as technical rules, ARTESP procedures and road safety to all workers, contractors, subcontractors or outsourced who carry out activities in the ROAD SYSTEM, including training and all accident prevention measures, implementation of collective protection equipment (EPC's), supply and guarantee of the use of personal protective equipment (PPE), availability of adequate and sanitized sanitary facilities, areas and shelters adequate for food and rest, adequate means of transport, preparedness to respond in emergency situations, etc.

- c.9. Ensure that noise levels and the concentration of pollutants in the system's facilities comply with the standards established in the relevant legislation. When the monitoring of such levels reaches 80% of the acceptable values in the legislation in force, the CONCESSIONAIRE shall carry out biannual measurements to assess the levels in question.
- c.10. Communicate to Organs competent bodies and to ARTESP the occurrence of environmental damage caused by third parties in the ROAD SYSTEM, as well as adopt all legal measures to eliminate them.
- c.11. Record all fires (probable origin, dimension, etc.) that occurred in the right of way and border strip, as well as the trampling and destination of all domestic and wild animals, in accordance with CETESB DD 141/2018/I or legislation that may succeed it, during the entire period of the SPONSORED CONCESSION.
- c.12. It is mandatory to send domestic animals captured alive to specialized institutions associated with them/partners in order to receive treatments (feeding, zoonosis control), according to the type of animal. An incident report, or something equivalent, must be drawn up, identifying the animal and the owner, in order to form a register of seized animals and their respective owners.
- c.13. Promote and/or participate in governmental environmental awareness programs regarding fire outbreaks and road kills by fauna. Additionally, the CONCESSIONAIRE must indicate and register in the SISGIS and keep an updated record, existing institutions in the surroundings of the ROAD SYSTEM to be used as support for the destination of wild/domestic fauna captured or even run over.

d. In the conservation of the ROAD SYSTEM:

- iv.1. Conserve and restore, throughout the SPONSORED CONCESSION period, the ecosystems in the RIGHT-OF-WAY, including preserving and highlighting the scenic landscapes existing in the ROAD SYSTEM.
- iv.2. Implement the vegetation covering throughout the RIGHT-OF-WAY where there is no vegetation cover, with the exception of paved areas and areas with rocky outcrops and altered rocks, prioritizing areas susceptible to erosive processes. Places with poor soils should be subject to the application of appropriate techniques, including fertilization and specific corrections, and technologies available on the market for these situations. When it is not possible to perform the vegetal covering, the Concessionaire must prove the situation through a Technical Report signed by a duly qualified professional. In the works, the CONCESSIONAIRE must adopt the vegetal covering, mainly in the cuts and embankments, in order to avoid the risk of erosion, to comply with the provisions of items 'd' and 'e' of sections 7.3.1 and 7.3.2 of the NBR 11682 - Stability of Slopes, of 08/2009, or another rule that may replace it.
- iv.3. Recover borrowing and disposal areas within the RIGHT-OF-WAY and other areas and support routes within a maximum of 30 (thirty) days after their use and/or deactivation.

- iv.4. Recover all non-conformities and degraded areas within the deadlines established in the CONTRACT or in a maximum of 15 (fifteen) days. In case of need for a longer period for recovery, it must be officially requested from the CONTRACTING PARTY, without prejudice to the analysis and validation by ARTESP on the merits.
- iv.5. Implement and properly maintain fauna transposition structures or wild fauna protection measures in places considered critical, resulting from technical studies originating from the records of pedestrian accidents and survey of the surrounding native fauna. All fauna passage structures must be monitored every four months by cameras or more advanced technologies that may succeed them and by a bed of footprints, installed inside and outside the passages, in a minimum sampling effort of 6 (six) days, in order to evaluate efficiency and need for adjustments. During the monitoring period of the passages, the monitoring of road kills by fauna on the highway in the vicinity of the evaluated passage (including the area along the entire length of the guiding fences) should also be intensified, with a view to evaluating the efficiency of the measures in reducing occurrences on the highway in operation.
- iv.6. Handle, temporarily store, collect, transport and dispose of solid waste and civil construction waste existing in the RIGHT-OF-WAY and arising from road operation or construction activities, along the entire length of the highways, as provided for in the AGREEMENT, to a suitable location, understood as the one indicated in the legislation in force. Recycling programs should be prioritized. The CONCESSIONAIRE shall be obliged to inspect the surroundings of the RIGHT-OF-WAY, in order to avoid the deposition of solid waste and debris from third-party activities in the surroundings of the RIGHT OF WAY. In places of frequent irregular disposal of waste, the CONCESSIONAIRE must work with the City Hall and/or neighboring areas to install appropriate dumps or containers, include a route for public waste collection and carry out awareness campaigns with neighboring areas.
- iv.7. In the case of herbicide application in the right-of-way by third parties, the CONCESSIONAIRE should immediately recover the area and take all legal measures against the offender; Programs to reduce generation, reuse and recycling should be prioritized.
- iv.8. Remove residues from cleaning, sweeping, drainage and river cutting activities, natural drainage, among other drainage elements to a suitable location, understood as the one indicated in the legislation in force.
- iv.9. Manage the generation and disposal of pavement milling residues, which may be left on hold in the right-of-way, provided they are stored in an environmentally appropriate manner, for a maximum of 90 (ninety) days, aiming at their reuse and recycling, in loco or forwarding to asphalt recycling plants. At the end of this period, they must be destined according to the legislation in force. It is recommended that the milled material be covered (canvas for example), to minimize the incidence of rain and sunlight, in order to reduce the potential for leaching and solubilization of organic compounds from the asphalt into the soil and groundwater.

- iv.10. Immediately remove dead animals found on the roadways and in the right-of-way within a maximum of 18 (eighteen) hours for animals that are run over at night and within 6 (six) hours for animals that are run over during the day. The registration of trampling and disposal of carcasses must comply with the provisions of the DD.141/2018/I of CETESB or legislation that may succeed it, adding information on the size of the animals. Preliminarily, the Concessionaire must submit to ARTESP a survey of all the Institutions existing in the municipalities surrounding the ROAD SYSTEM that may receive the animals that are run over.
- iv.11. Do not use herbicide on weeding vegetation etc. in the ROAD SYSTEM RIGHT-OF-WAY. In the case of using other inhibitors of growth of competing vegetation, the CONCESSIONAIRE must follow the legislation in force and send the application plan for prior approval by ARTESP. If there is still application of herbicide in the RIGHT-OF-WAY by third parties, the CONCESSIONAIRE must recover the area immediately and take all legal measures against the violator.
- iv.12. Compulsorily control pests such as termites, ants, ticks, invasive plants and ensure proper management when bats are identified, etc. in the RIGHT-OF-WAY and in the operational and service tunnels.
- iv.13. Allocate oils and greases from equipment and vehicles intended for the expansion, operation, conservation of the system in accordance with the legislation.
- iv.14. Immediately eliminate the affected areas and restore all phenomena that may occur in the RIGHT-OF-WAY, such as erosion, subsidence, landslides, silting, spillage of hazardous products, oils and greases, etc., which are causing environmental damage, or according to schedule approved by ARTESP or competent bodies.
- iv.15. Carry out an assessment of the potential for contamination of underground soil and water, if contaminated land of any nature is identified during conservation work, according to CETESB Board Decision 37/2017, or another that may complement or replace it, the be conducted by a specialized company to be contracted by the CONCESSIONAIRE. If there is a need to remediate the area, the costs of remediation must likewise be borne by the CONCESSIONAIRE. On the other hand, in the case of identification of contamination, of any nature, however, with a suspected generating event outside the RIGHT-OF-WAY, the CONCESSIONAIRE shall notify the legal representatives of the surrounding area, who will be responsible for managing the contaminated area, the CONCESSIONAIRE shall only evaluate the interferences that may mutually occur between the work and the contamination coming from this area.
- iv.16. Obtain authorization from ARTESP, prior to the implementation of any support area in the RIGHT-OF-WAY. It is prohibited borrow pit areas, send-offs, milling deposits at the central site, loops of intersection and/or in cava shape, which could endanger the system. The implementation of support areas outside the right-of-way must be preceded by authorization from the competent environmental agency, according to SMA 30/2000 or another that may replace it. Preferably, avoid the allocation of support areas within Conservation Units defined in Federal Law No. 9,985/2000, especially those of Integral Protection.

For the external audit, the CONCESSIONAIRE shall, in addition to the other obligations provided for in the AGREEMENT, ANNEXES and APPENDICES, hire a company with a well-known technical reputation.

5. DEADLINE FRAMEWORK

Deadlines whose initial milestones were not specified will be counted from the date of the CONCESSIONAIRE and/or the information being sent by ARTESP.

ACTIVITY	ANNEX ITEM	DEADLINE
Obtaining a license, environmental authorization, granting or consent from the competent authority for the ROAD SYSTEM	1	BEFORE OPERATION START DATE.
First Initial Road Inventory	2.1.3	BEFORE OPERATION START DATE.
Initial topographic survey of the Road System	2.1.3.2	BEFORE OPERATION START DATE.
Registration survey of RIGHT-OF-WAY	2.1.3.3	BEFORE OPERATION START DATE.
Action plan for the implementation of the integrated digital model of the road system (MDSR)	2.1.3.4	BEFORE OPERATION START DATE.
Program implementation of the integrated digital model of the road system (MDSR)	2.1.3.4	BEFORE OPERATION START DATE.
Hydrological study of the road system	2.1.3.5	BEFORE OPERATION START DATE.
Study of critical areas regarding the occurrence of surface dynamics processes	2.1.3.5	BEFORE OPERATION START DATE.
Process of identifying anomalies in the Road System	2.1.4	BEFORE OPERATION START DATE.
Device suitability	2.3 d1.1.	BEFORE OPERATION START DATE.
Device suitability	2.3 d.2.1	BEFORE OPERATION START DATE.
First Slope Monitoring report	3.2.5	BEFORE OPERATION START DATE.
Implement and operate an Environmental and Social Management System in line with IFC's PS1 and ISO rules 14,001, 14,004 and 45,001.	4.1.	CONDITION FOR COMPLETION OF THE PRE-CONSTRUCTION PERIOD.
Obtain NBR ISO 14,001, 14,004 and 45,001 certificates	4.1.	BEFORE OPERATION START DATE.