



**ALGORTA - FRAY BENTOS
PPP RAILWAY PROJECT**

**TECHNICAL
SPECIFICATIONS**

December 2015

Spanish version is the only legally binding document

CONTENT

1. PURPOSE

- 1.1. Description of the project goal
- 1.2. Other characteristics of the project

2. REMUNERATION OF CONTRACTOR CORPORATION

- 2.1. Availability Payment
 - 2.1.1. Introduction to the calculation of the availability payment
- 2.2. Availability criterion, pay adjustments for lack of availability
 - 2.2.1. Availability Criterion
 - 2.2.2. Lack of Availability
- 2.3. Exceptions to unavailability
- 2.4. Determination of availability payment
 - 2.4.1. Calculation procedure of Availability Payment
 - 2.4.2. Penalties
- 2.5. Procedure for payment to the contractor
 - 2.5.1. Bimonthly settlements
 - 2.5.2. Annual settlement of availability payments

3. INDICATORS

- 3.1. Availability (Indicator 1)
- 3.2. Response to incidents and events (Indicator 2)
- 3.3. Quality
 - 3.3.1. Conservation of slopes of embankment (Indicator 3)
 - 3.3.2. Drainage (Indicator 4)
 - 3.3.3. Ballast (Indicator 5)
 - 3.3.4. Sleepers (Indicator 6)
 - 3.3.5. Rail and track geometry (Indicator 7)
 - 3.3.6. Joints and fasteners (Indicator 8)
 - 3.3.7. Crossings and track switches (Indicator 9)
 - 3.3.8. Platform cleaning (Indicator 10)
 - 3.3.9. Track switch and signaling operation (Indicator 11)
 - 3.3.10. Level crossings (Indicator 12)
- 3.4. Infrastructure Comprehensive Management (Indicator 13)
- 3.5. **CONTRACTOR'S OBLIGATION IN THE COMPREHENSIVE MANAGEMENT OF INFRASTRUCTURE**
- 3.6. Database
- 3.7. Monitoring and recognition of the state of infrastructure
- 3.8. Follow-up reports

4. ANNEXES

- ANNEX A - Technical Specifications for railway ballast
- ANNEX B - Specifications for protection of level crossings
- ANNEX C – Technical standards for the design and calculation of railway bridges
- ANNEX D – Technical specifications for the commissioning of the infrastructure



1. PURPOSE

This document contains the technical conditions and basic procedures for the rehabilitation and maintenance of the infrastructure, tracks and detours for Algorta - Fray Bentos. The activities in question are the ones required to ensure - as regards to infrastructure, tracks and detours - the safety of railway traffic, people and goods transported, keeping the regularity indexes that characterize the trains running on the line.

The required activities to achieve the previously mentioned goals are as follows:

- Preservation of track geometry and switch gear quality
- Ensure the correct and safe operation of the track superstructure different elements
- Keep longitudinal and cross drainage systems operational
- Take prompt remedial action in case of incidents
- Implementation of surveillance and precautionary measures

1.1. Description of the project goal

The aim of the project is to do the necessary works for rehabilitation and subsequent maintenance of the following railway track segments:

Name of the segment	Beginning of the segment	End of the segment	Length of the segment
Algorta - Fray Bentos	Algorta Station (km 409)	Fray Bentos Station (km 550)	141.192 km

The goal is to improve the current state of the tracks to achieve the following standards of speed and load capacity:

- Axle load: 22 tons
- Circulation speed: 60 km/h.
- The new track will be constructed in accordance with the criteria and technical standards contained in these Technical Specifications and their annexes, and shall be maintained in accordance with these standards during the validity period of the contract. Maintenance shall be done complying with the current standards at the time. For the areas where these Technical Specifications and their annexes do not indicate otherwise, the AREMA standards must be followed (*American Railway Engineering and Maintenance-of-Way Association*).
- The rails must be of a weight equal to or greater than 50 kg/meter and comply with the ALAF 5-030 standard.
- The sleepers may be made of concrete, metal or hard or treated wood and must comply with the appropriate ALAF standard.

ALGORTA - FRAY BENTOS PPP

All sleepers of a track switcher must be made of the same material, as well as all the sleepers of a bridge, if present. No mixing of sleepers of different materials in a segment between switch gear, level crossings or bridges, will be allowed.

- The sleepers shall rest on a layer of ballast with a thickness according to their type, in compliance with the operating conditions of the tracks set forth in this document. Ballast must comply with the characteristics specified in Annex A.
- Meeting the conditions required for rails and sleepers in the preceding paragraphs, the Contractor Corporation may build the most appropriate track structure to comply with the requirements of this document.
- The Contractor Corporation must follow the Environmental Manual for Works and Activities of the Railway Sector, prepared by the Ministry of Transport and Public Works.

1.2. Other characteristics of the project

- The stations to remain operational are the following:

Station	Progressive (km)
Algorta	408.988
Young	450.334
Ombucitos (connecting station with Mercedes Line)	525.553
Fray Bentos	549.551

- In Algorta station, tracks connecting with the Artigas line and the track switcher among them, will be overhauled.
- In Young station a secondary track must be conditioned, extending it 800 meters to allow train crossings with their corresponding track switchers.
- In Ombucitos Station, tracks connecting the Mercedes line and up to 800 (eight hundred) meters of useful length on this line, will be conditioned.
- In Fray Bentos station a secondary track will be conditioned, extending it to 800 meters of useful line. Tracks connecting with the roundhouse, the track turntable and the access track to the port, have to be conditioned.
- Changes in access to these detours have to be operated as set out in the General Operating Regulation of the National Railway Transport Administration.



TECHNICAL SPECIFICATIONS

- All mechanical railway systems and track switches of the enabled stations will be modified to comply with the required modifications, being kept in proper working order during the validity of the contract.
- Level crossings will be protected in accordance with the legal requirements of Annex B (based on the Hazard Index). In all cases, besides the protection system arising from the application of the hazard index, level crossings will have fixed signaling, diagonal strut type, indicating "Railroad Crossing" and reflective signs for the railway operator located at a suitable distance indicating the presence of the level crossing.
- Cattle guards and other necessary facilities at level crossings to avoid the presence of animals on the track (cattle, horses and other livestock that could cause train accidents) shall be provided by the Contractor. These facilities must remain functional for the life of the contract.
- Level crossings in urban areas and on domestic routes will be protected by automatic railway barriers.
- All level crossings that should be secured with barriers or light and sound signals, shall be automatically operated by track circuits or magnetic sensing devices with axle counters. They will also have 3-color light signals for the operator located at appropriate distances, at both sides of the level crossing. These signals tell the driver if the level crossing protection is working properly. The distance is adequate if it is enough for the train to stop when the signal indicates a fault in the protection system of the level crossing.
 - Signals indicating the driver nearby level crossings have to be coordinated together.
 - All level crossings with barriers or light and sound signals, shall have an automatic faults and breaks detection system that automatically reports them via cell phone and the Internet to a Contractor's maintenance center, the State Railways Administration's train monitoring center and whoever the Contracting Administration deems appropriate. This system also detects the opening of command cabinets and level crossing batteries. Wiring shall not be within ducts, but buried more than 80 cm deep and within a 10 cm layer of concrete.
- For all systems to be installed, the following standard must be met: in the event of failure, the system shall automatically react to a position or configuration that does not create a hazard for people (fail-safe principle).
- All bridges and culverts of the section under this Contract shall be checked and if necessary, reconstructed to withstand loads up to 22 tons per axle; in addition, the respective drainage and runoff sections scheduled for the contract period, must also be verified. Requirements for bridges are in Annex C of these Technical Specifications.
- Fences between the track segment under this project and the neighboring land, will be subject to the provisions set forth in the Rural Code.

ALGORTA - FRAY BENTOS PPP

- The wooden or steel sleepers and the double bolts with their tightening plates retrieved from the disassembly of the existing track and not going to be used in this project, must be delivered properly stockpiled at the State Railways Administration's network enabled stations.
- Other materials of the existing track, including the rails, will be owned by the Contractor, if the Economic-Finance Plan of its bid included an item of income from this source. Otherwise, the rails must be delivered properly stockpiled at the State Railways Administration's network enabled stations. Such rails do not have the required weight to be used in this project.
- Regarding operational matters, the General Code of Operating Rules will apply (GCOR).

2. REMUNERATION OF CONTRACTOR CORPORATION

2.1. Availability Payment

1. Remuneration of the Contractor Corporation for the performance of the contract is determined by income received from the Contracting Administration for Availability Payment (AP, hereinafter). This payment shall be the value mentioned in the bid, adjusted according to the effective availability level and infrastructure quality, as described below.
2. Availability Payment is defined (AP) as the amounts the Contracting Administration shall pay the Contractor Corporation as consideration for the execution of the different tasks and services subject of this contract, in relation to the provision of safe and quality rail infrastructure and technical sustainability, according to the indicators of availability, response to incidents and events, and comprehensive quality management, defined in Chapter 3 of these bases.
3. Such amounts will be automatically adjusted to the value received from such service, as described below.
4. Availability payments will begin to accrue only after the total length of the infrastructure has been completely restored as specified in clause 1.1 of these rules, the review of the infrastructure has been made as specified in Annex D and the commissioning of the work has been granted.
5. The income the Contractor Corporation has the right to earn, will be paid in arrears, bimonthly calendar days, upon verification of the availability criteria, and compliance with the response to incidents and events indicators, and comprehensive management quality, including levels or thresholds for certain indicators, as described in the following sections.
6. For indicators of Availability, Response to incidents and events and Comprehensive infrastructure management, the entire distance Algorta - Fray Bentos will be considered as a single segment



In applying the deductions for noncompliance with Quality indicators, availability payment will be affected, based on the number of sub-sections with noncompliance. For these purposes, the infrastructure shall be divided into three sub-segments:

Sub-segment	Distance
Sub-segment 1: Algorta - Young	41.35
Sub-segment 2: Young - Haedo	53.72
Sub-segment 3: Haedo - Fray Bentos	45.50

In the above table, Young refers to kilometer 450.334 and Haedo to kilometer 504.056, starting from kilometer zero.

Each sub-section is equally weighted, as will be indicated in sub-chapter 3.3.

2.1.1. Introduction to the calculation of the availability payment

1. Conceptually the availability payment accrue during a period "t" will be:

$$PPD_t = PM_t - Z_t$$

Where:

- PPD_t is the Availability Payment accrued during period "t"
 - PM_t is the maximum payment stipulated in the contract, during period "t"
 - Z_t is the discount during the corresponding time period "t". This is calculated using a set of sub-factors that are detailed in the formulas contained in paragraph 2.2, and then explained.
2. Indicators of Availability, response to incidents and events, and comprehensive Quality Management, included in the definitions, their requirements and how to determine noncompliances, are described in detail in Chapter 3 of these Technical Specifications.
3. In the contract for this project, the maximum payment is set on a daily basis. In order to measure the availability as a unit and bring payment to the value of the service received / paid, the discount calculation is performed in 4-hour periods, that is, sixth parts of day. The PPD accrued on a given day will be the maximum daily payment, less the sum of the discounts that apply to each of the six blocks of four hours for that day.

Thus, the bimonthly PPD accrued by the contractor for the railway infrastructure is the sum of payments corresponding to each day of the period.

2.2. Availability criterion, pay adjustments for lack of availability

2.2.1. Availability Criterion

For the contractor to have the right to earn all the income through availability payment in each period of time considered, the infrastructure will have to comply with:

- Not being closed or blocked in any part so that train traffic is prevented in any part of the length of the railway infrastructure subject of this contract, and throughout the availability period considered, unless it is motivated by the events described in 2.3 UNAVAILABILITY EXCEPTIONS of these Technical Specifications.
- Not having any infringement or unavailability event in any segment that should have been resolved or corrected by the Contractor Corporation in the expected response time, but was not.
- Not having any infringement that does not have an assigned response time (that is, its response time is zero or null).

2.2.2. Lack of Availability

When the availability criterion of the preceding paragraph is not fulfilled, an "Adjustment Factor" shall be applied to the payment period during the duration of the fault, in accordance with the availability, response incidents and events, quality and comprehensive management indicators, as defined in Chapter 3. This chapter presents functional requirements for availability and quality of infrastructure and the thresholds, if any, of the objective indicators for monitoring compliance with these requirements, which may lead to lack of availability. In this sense, a failure of availability may lead not only to the disruption of railway traffic, but also to failures in the quality of infrastructure or its comprehensive management.

There has been a lack of availability in the infrastructure if there is noncompliance with the technical conditions stipulated in Chapter 3 or, the event has not been rectified within the response time set. In such cases, the adjustment is applied retroactively from the time the corresponding unavailability is detected.

In case of unavailability, the conditions of functional availability are considered breached and deductions or adjustments described in this document shall be applied, depending on the seriousness of the infringements in the availability, as defined in Chapter 3. The adjustment factor for the category "available" is zero (FA = 0) and the one for "not available" is equal to 1 (FA = 1). The adjustment factor can take intermediate values, depending on the seriousness of the infringement, as described in this chapter.

2.3. Exceptions to unavailability

For the purposes of this chapter, the railway infrastructure is not considered unavailable when the following events occur:



- a. Total or partial closing or blockade of the infrastructure is due to reasons attributable to the Contracting Administration, to direct action of the Contracting Administration or to direct orders given by the competent authorities regarding safety or railway traffic organization, which are not attributable to noncompliances of the Contractor Corporation.
- b. Total or partial closing or blockade of the railway infrastructure is attributable to ordinary or extraordinary maintenance work done in accordance with the previously defined maintenance schedule, or work done due to previously requested and authorized schedule changes, which the Contractor Corporation will have to make sure has the minimum possible impact on railway operations.
- c. During the time to respond to incidents and events referred to in section 3.2 for accidents or other anticipated events.

2.4. Determination of availability payment

2.4.1. Calculation procedure of Availability Payment

The availability payment system aims to provide the necessary incentives to effectively and quickly resolve nonconformities, since the application of deductions automatically affects the entire period during which the ruling is implemented. To this end, the time from which a nonconformity is detected or an incident or event occurs, is counted, until the contractor finds the solution envisaged in these technical specifications.

To calculate the AP, the following concepts related to response times (RT) and the adjustment factor indicator (F_j) are defined:

- Response Time, TR: time available to solve nonconformities, from the time of detection, which is initially exempt from deduction in the availability payment. Once the Response Time has expired, the adjustment factor starts to be applied retroactively, from the time of the incident that triggered the noncompliance.
- Indicator Adjustment Factor, F_j: percentage of deduction to be applied to the payment formula, depending on the seriousness of the noncompliance in indicator "j". The appropriate adjustment factor will be applied to the entire nonconformity period.

The value of the indicator adjustment factor will be determined depending on the time taken to solve or address a failure or event, and on the value of the defined response time for that indicator, as indicated in Chapter 3. The elapsed time will be expressed in units of 4 hours as follows: duration measured in hours will be divided by 4 and, if that quotient is not an integer, it will be rounded to the nearest greater integer. In other words: it will be the minimum integer number greater or equal to the duration measured in hours divided by 4.

ALGORTA - FRAY BENTOS PPP

The discount corresponding to each noncompliance is calculated as the product of the indicator adjustment factor, by the number of 4-hour units the noncompliance lasted, by PM/6, where PM is the daily Maximum Payment established in the contractor's bid.

That is, for the k-th payment period noncompliance:

- FA_k is the appropriate indicator adjustment Factor
- M_k is the noncompliance period measured in hours
- N_k is the minimum integer number greater than or equal to $M_k/4$ (the noncompliance period measured in 4-hour units)
- Z_k is the discount value corresponding to that noncompliance: $FA_k * N_k * PM / 6$.
- PM is the daily Maximum Payment stipulated in the contract.

In a payment period of D days, the availability payment will be: D times PM minus the sum of discounts for noncompliances in the payment period, if they happened at different times. In this case, the formula to calculate the Availability Payments is as follows:

$$D * PM - \sum_{\text{todo } k} Z_k$$

In the event that at one time more than one noncompliance had happened, the procedure will be as follows:

Each day of the period will be divided into 6 parts: 0 to 4 hours, 4 to 8 h, 8 to 12 h, 12 to 16 h, 16 to 20 h and 20 to 24 h. In a payment period of D days there are 6*D parts, which will be indexed with $p = 1, 2, 3 \dots 6D$.

The elapsed time until the solution of each incident, event or nonconformity, expressed in 4-hour units as said before, will be allocated to the parts of the payment period that most closely represent the time when noncompliance actually happened. This means that for each sixth part of day from the payment period days, the corresponding Indicator Adjustment Factor or Factors will be assigned, indicated by: $\{F1_p, F2_p, F3_p \dots F13_p\}$, where F_j is the indicator adjustment factor J and $p = 1, 2, 3 \dots 6D$.

For each part $p = 1, 2, 3 \dots 6D$ of the payment period, the corresponding General Adjust Factor will be the greatest factor adjustment indicator plus 0.1 times the sum of the other indicator adjustment factors, without the sum exceeding one. This is equivalent to:

$$FA_p = 0,9\max\{F1_p, F2_p, F3_p \dots, F13_p\} + 0,1(F1_p + F2_p + F3_p \dots + F13_p)$$

$FA_p = 1$ or, whichever is less.

In a payment period of D days, the availability payment will be calculated as:

$$D * PM - \frac{PM}{6} * \sum_{p=1}^{6D} FA_p$$



The annual payment accrued by the contractor shall be the sum of the payments accrued by each of the payment periods of the year, which in turn will be the sum of the payments accrued for each of the 4-hour units the payment period is composed of.

2.4.2. Penalties

For each indicator a maximum time for noncompliances resolution is defined. If these violations have not been corrected at the end of the maximum period defined, additional contractual penalties may be imposed, which is not to be confused with the automatic deductions.

- **Noncompliance period with deduction:** The time indicated in each box is the maximum correction period before imposing the corresponding penalties.

Upon expiration of the noncompliance period, the adjustment factor will continue to be applied for the entire time of the violation of the indicator in question, which will result in contractual penalties as well, according to the general system of penalties in this contract.

2.5. Procedure for payment to the contractor

2.5.1. Bimonthly settlements

1. Payments to the contractor will be settled every calendar bimester expired (except the first and last, as detailed in the contract). To do so, each period the Contractor Corporation will submit an availability payment request, calculated in accordance with the rules in these conditions, regarding the immediately preceding period.
2. The application shall contain details of the settlement discount breaking down the elements that apply in the period, as defined in paragraph 2.4.
3. The calculations contained in the request for the Contractor must be justified based on the information on the incidents and all relevant information that may be required by the Administration to calculate the PPD, collected in the reports specified in chapter 4.
4. If at the date of preparation of the request, nonconformities from the reference period remained unresolved, calculations will include the discounts calculated as if the solution had occurred at the end of the payment period. The application form of the next payment period shall detail, for those indicators, the adjustment factors and the corresponding discounts according to the Technical Specifications. If necessary, correction of the Availability Payment previous period, will be applied in that payment period. If necessary, these adjustments will continue to be applied to subsequent payment periods.
5. Upon receipt of the corresponding payment request, within a maximum period of fifteen (15) calendar days from receipt, the Administration will review the calculations and submit them to the contractor, either accepting the request or with the appropriate comments, corrections and requests for clarification, if necessary. This response shall contain the payment proposal made by the Administration for the reference period. If within that time the Contracting Administration fails to submit its payment proposal, it is deemed to have accepted the Contractor's proposal.

ALGORTA - FRAY BENTOS PPP

6. The contractor shall thereafter submit invoice for the amount not in dispute. All invoices will be made in Uruguayan pesos, according to the value of the IU the first day of the invoicing period. The Contractor shall respond to requests for clarification and revision of the settlement calculations, duly corrected, along with a request for final payment, or raise any relevant objections. Lack of response from the Contractor within ten days, implies accepting the calculation provided by the Administration.
7. In case there had been discrepancies in the maximum term of ten (10) days from receipt of the observations made by the Contractor Corporation, the Administration shall send the properly adjusted, final calculations so that the Contractor Corporation can issue the final invoice, without impairment of payment of the corresponding partial invoice for the amount not disputed.
8. Payment to the Contractor Corporation will be made no later than thirty (30) days from receipt of each invoice.

2.5.2. Annual settlement of availability payments

1. Settlement adjustment will take place annually, according to the result of the review and, if necessary, audits in accordance with the provisions of the Contract.
2. Given the outcome of these reviews and audits, before March 30 each fiscal year the final settlement will be determined as the difference between the sum of the calculated values as shown in Section 2.4.1 with the revised data, and the sum of the bimonthly payments made the previous year, minus the possible penalties as appropriate.
3. The final settlement will go together with a written report from the Administration and the Contractor Corporation, detailing the degree of compliance with the quality and availability criteria and their impact on the amounts to be received in relation to the previous year.
4. The amount resulting from the final settlement will be added to the next payment to the Contractor if it is on behalf of the Contracting Corporation and subtracted if it is on behalf of the Administration.

3. INDICATORS

In this chapter the technical conditions of the contract for the infrastructure operation phase are defined. These conditions are defined by using indicators that adequately and effectively reflect the value of the parameters that define the actual conditions of the infrastructure.

The indicators considered allow to define the availability and quality levels of the railway infrastructure under this contract, as well as their management, which are used to determine availability payments the contractor is entitled to.

The essential function of the indicators is to establish the quality of the work performed by the contractor and the quality perceived by the end user of the infrastructure.



In order to assess and monitor design quality, work execution and maintenance indicators during the infrastructure operation period, the following indicators are considered:

- Availability
- Response to incidents and events
- Quality
- Infrastructure comprehensive management

The first two items are linked to the operation and maintenance outcome, while the third one depends on the intrinsic quality of the facility (depending on its definition and implementation quality) and its evolution over time and traffic (depending on its initial quality and maintenance).

Additionally, comprehensive management indicators are important to ensure the infrastructure maintenance is based on a preventive, not corrective strategy.

These indicators will measure the infrastructure quality throughout its life cycle, both from the system availability and its operation standpoint. The result of these measurements will serve to evaluate the contractor and establish the appropriate payments according to the method established.

All indicators deadlines are in calendar days.

3.1. Availability (Indicator 1)

Demanded standard

No part of the railway infrastructure of this contract may be closed or blocked, so that train traffic is not prevented during the availability period considered, unless it is motivated by the events described in 2.3.

Response time

Response Time will be zero.

Adjustment factor

The Adjustment Factor for the Availability indicator, F1, will be applied as follows:

Unavailable	Available
1	0
Some part of the railway infrastructure of this contract is closed or blocked, so that train traffic is prevented during the availability period considered, unless it is motivated by the events described in 2.3.	No part of the railway infrastructure of this contract is closed or blocked during the availability period considered, so that no train traffic is prevented along its length. If it is blocked, it is due to the events described in 2.3.

Penalties

The Contract Supervisor will set the maximum term and minimum conditions for the return of all trains and track vehicles to the railway infrastructure sector affected by unavailability.

In the case, unjustifiably, the deadline or the minimum railway conditions are not met, the penalties established in the contract may be applied.

The only reasons considered justified are those of force majeure or those affecting the activities of the Contractor, which clearly have been beyond its sphere of action.

if, unjustifiably, the deadline set by the Contract Supervisor is exceeded by more than 100%, the Contracting Administration may terminate the contract.

3.2. Response to incidents and events (Indicator 2)

Demanded standard

Anything that prevents or puts at risk the safe movement of trains, will be considered an incident or event. Notice of incidents and events may be performed by any of these agents:

- Railway manager
- Insolvency of the Contractor Corporation.
- Railway operator(s)

for which the Contractor Corporation shall establish the means of communication to be used.

The Contractor shall respond to incidents and unforeseen events with the necessary speed to minimize the unavailability of infrastructure and restore its use. In major incidents or events with victims or potential effects on third parties, as well as hazardous materials spills or similar situations, the Contractor shall immediately inform the administration. In all cases, the Contractor must submit the corresponding report within the time limit set for it.

Before any incident or event infrastructure, a patrol of the Contractor Corporation must be in place and proceed to perform the necessary tasks to restore operation, if possible, or to initiate the appropriate procedures to restore operation, in the event that additional construction means are needed. The Attention item of this indicator refers to the presence of the patrol. Actions corresponding to this patrol are described in the incidents and events Protocol management, as mentioned below.

If the incident or event involves rolling stock that is not the Contractor's responsibility, it must wait for the Relief train. The Contractor is obliged only to pay attention and provide the supporting elements defined in the Incident and Events Management Protocol.

In any case, damage to the infrastructure under this contract must be repaired by the Contractor before the first movement in that site, regardless of the cause of the incident or event.

Then, the contractor may request compensation to whom it may concern according to applicable regulations. Responsibility for the incident will be determined according to applicable regulations.



TECHNICAL SPECIFICATIONS

The Contractor will design an incident and management protocol including the procedures and actions to be undertaken in case of incidents and events. This protocol should be based on what has been presented as part of the technical offer and changes must be approved by the Contract Supervisor, who cannot oppose without good reason. This Protocol shall contain specific procedures for the most common and also most serious incidents, including at least the following:

- Derailments
- Hazardous substances spill
- Slopes of embankments and embankments landslide
- Track occupation and its side of the railroad condition
- Defects in the railway not attributable to the contractor, which constitute a safety risk.

If the incident or event had emerged due to the Contractor's responsibility, Indicator 1, Availability, will be applied. Otherwise, this Indicator 2, Incidents and Events Response, will be applied. Indicator 2 will be determined for the following actions:

- Attention: time it takes the patrol to arrive at the scene of the incident and initiate appropriate action according to the defined Protocol.
- Immediate resolution: the time it takes the Contractor to restore railway operations in case of incidents and events whose resolution can be achieved with the equipment defined in the incidents and events management Protocol.
- Resolution with additional construction means: time taken by the Contractor to restore railway operations in the case of incidents and events whose resolution requires additional means of construction.

The time taken by the Contractor to restore railway operations will be counted from the moment the Relief Train is withdrawn, if needed, or from the moment an incident or event is reported.

Response Time (RT)

The values for the Response Times (RT) of each item are as follows:

Item	Value
Attention	4 hours
Immediate resolution	24 hours
Resolution with additional construction means	7 days

In case that additional means of construction are required, the Contractor may exceptionally request an extension of the response time of up to 100%, if the seriousness of the incident or the size of the corrective actions so require, request that will be resolved by the Contract Supervisor. In no case may the extension be granted if the incident or damage were attributable to the Contractor.

Deduction

A deduction of the availability payment for Indicator 2, incidents and events Response, can be applied once the solution exceeds the defined Response Time.

Adjustment factor

The Adjustment Factor for this indicator, F2, will be applied as follows:

Unavailable	Serious	Misdemeanor	Available
1	0.7	0.3	0
The solution is implemented after twice the RT defined.	The solution is implemented after 1.5 times the RT defined.	The solution is implemented after the RT defined.	The solution is implemented before the RT defined.

Penalties

The Contracting Administration may impose sanctions and fines to the Contractor Corporation if the solution time of the incident or event exceeds what is indicated in the following table:

Item	Value
Attention	12 hours
Immediate resolution	72 hours
Resolution with additional construction means	14 days

In case that additional means of construction are required, the Contractor may exceptionally request an extension of the response time of up to 100%, if the seriousness of the incident or the size of the corrective actions so require, request that will be resolved by the Contract Supervisor. In no case may the extension be granted if the incident or flaw were attributable to the Contractor.

3.3. Quality

The quality of the subsystems and their evolution is measured by a series of quality indicators. These quality indicators are also a basic element for the availability payment management. These indicators and how they operate are described in the following subsections.

The Contracting Administration will be directly responsible for the inspection of the indicators data collection management. However, the Contractor shall implement a monitoring system (see Chapter 4) whose results will be available to the Administration at all times. All data will ultimately be managed within the Contract Comprehensive Management operations, as described in Chapter 4.



The method to determine quality control indexes and their frequency of execution are specific to each functional unit and/or element to be evaluated.

Quality indicators are applied when noncompliances allow to keep train traffic in the affected section, even if it is by reducing speed traffic (precautions) along it. Precautions shall be established in accordance with the Administration's ruling, which may take into account the provisions set forth in the ALAF 5-026 standard. It is the responsibility of the Contractor to inform about the existing precautions, both through the established communication systems and railway signs, in the section concerned.

From the moment that Penalties can be applied as established for each quality indicator, the Administration may also apply an Adjustment Factor equal to 1 to the indicator showing the noncompliance originating such penalties.

3.3.1. Conservation of slopes of embankment (Indicator 3)

Demanded standards

Stabilizing, protection and monitoring of earth moving works elements, shall be maintained in good working order. Any defect must be signposted and adequate measures taken. The goal will be to keep the initial geometry and stability of earth moving works.

In case a slope of embankment landslide, either in an excavation or an embankment, causes a problem or obstruction to the track, it will be considered a failure in Indicator 1, Availability, unless it was caused by an unusual weather event as determined by the Contract Supervisor, in which case Indicator 2, Attention to incidents and events, will be applied. If the landslide was caused by a non-weather event beyond the control of the Contractor, Indicator 2, Attention to incidents and events, will be applied until traffic is safely restored. Once traffic is restored, this Indicator 3 will be applied, if still necessary.

In case a slope of embankment landslide, either in an excavation or an embankment, does not cause a problem or obstruction to the track, Indicator 3, Availability, will be directly applied, regardless of the cause of the landslide.

In the event of any slope of embankment landslide, there will have to be a rapid and effective response to remove the track structure and landslide elements from the shoulder. Protective ditches must be free from landfills or objects.

The slopes of embankment conservation indicators are the response times of the various actions to correct their landslide. The indicators are

- Attention: The patrol arrives at the place and initiates appropriate action according to the defined Protocol.
- Correction of defects in meshes, walls or other protective elements.
- Removal of materials due to landslide.

ALGORTA - FRAY BENTOS PPP

- Have new containment systems.

Response Time

The values for the Response Times (RT) of each item are as follows:

Item		Value
Attention		4 hours
Correction of defects in meshes, walls or other protective elements		48 hours
Removal of materials due to landslide and reconstruction of the platform and slopes of embankment.	< 2,000 m ³	24 hours
	> 2,000 m ³	Special situation*
Have new containment systems	< 2,000 m ³	1 week
	> 2,000 m ³	1

*The response time in special circumstances will be determined by the Administration once the Contractor has proposed an Action Plan. In these cases the Contractor has 48 hours to propose that plan.

Deduction

A deduction of the Availability Payment for the slope of embankment conservation indicator will apply if the response time is not met.

Adjustment factor

The Adjustment Factor for the slope of embankment conservation indicator, F3, will be applied as follows, depending on the time between a nonconformity is detected and corrected:

Serious	Misdemeanor	Available
0.233*s	0.1*s	0
Time is greater than twice the RT set.	Time is greater than the RT set.	Time is less than the RT set.

Where $s \in \{1, 2 \text{ or } 3\}$ is the number of sub-sections with noncompliances.

Penalties

The Contracting Administration may impose sanctions and fines to the Contractor Corporation if the solution time of the incident or event exceeds what is indicated in the following table:



Item		Value
Correction of defects in meshes, walls or other protective elements		6 days
Removal of materials due to landslide and reconstruction of the platform and slopes of embankment.	< 2,000 m ³	72 hours
	> 2,000 m ³	3 times the RT set.
Have new containment systems	< 2,000 m ³	21 days
	> 2,000 m ³	90 days

3.3.2. Drainages (Indicator 4)

The design and dimensioning of ditches and other drainage structures (culverts, sewers, drains, among others) is the responsibility of the Contractor. They must be of sufficient size and construction to smoothly direct the expected water flow.

Any railway obstruction due to waterlogging (except events considered exceptional) will affect the availability indicator.

Demanded standards

All drainage elements shall be maintained in good working order. The demanded conditions are as follows:

- All drainage elements must be clean, free of obstacles and without structural damage.
- Downpipes, boxes, shafts, sewers and the like, should be firmly protected by the ground or surrounding material.

Particular attention must be paid to drainage conditions in track switchers, level crossings, rail ends on bridges, everywhere conditions may restrict the proper drainage of rainwater.

The cleaning and repair of the drainage works indicator is the response time of the various actions to correct the nonconformity.

Response time

The values for the Response Times (RT) of each item are as follows:

Item		Value
Nonconformity correction	When it affects the platform	24 hours
	When it does not affect the platform	14 days

ALGORTA - FRAY BENTOS PPP

Deduction

A deduction of the Availability Payment for the slope of embankment conservation indicator will apply if the response time is not met.

Adjustment factor

The Adjustment Factor for the Drains indicator, F4, will be applied as follows, depending on the time between a nonconformity is detected and corrected:

Serious infringement	Misdemeanor	Available
0.233*s	0.1*s	0
Time was greater than 1.5 times the RT.	Time was greater than the RT.	Time was less than the RT.

Where $s \in \{1, 2 \text{ or } 3\}$ is the number of sub-sections with noncompliances

Penalties

The Contracting Administration may impose sanctions and fines to the Contractor Corporation if the time to correct the nonconformity exceeds what is indicated in the following table:

Value	
When it affects the platform	48 hours
When it does not affect the platform	30 days

3.3.3. Ballast (Indicator 5)

The ballast must provide sleepers with uniform support and proper lateral containment maintaining the correct cross-section and especially the uniformity of the shoulders (ballast borders). The ballast cannot cover or be on a higher level than the sleepers. Regarding switch gear, it must not interfere with the points of switch moving parts or track switch bars.

The ballast section must be free of vegetation and meet the criteria for limiting pollution set forth below.

The new ballast that may be necessary to incorporate during maintenance must meet the same conditions as the ballast used for the construction of the railway.

Thresholds

The ballast is considered unacceptable when it does not comply with the provisions of the first two paragraphs of this section or when the pollution index (IC) verifies the following:

- $IC < 5$ for the first two years from traffic authorization of all the railway between Algorta and Fray Bentos.
- $IC < 10$ for the period between year 2 and year 15 starting from the same moment.



- IC < 20 from year 15.

"Pollution index" is the name of the value defined as follows:

$$IC = P_4 + P_{200}$$

Where:

P4 is the percentage passing sieve N° 4 (4.75mm)

P200 is the percentage passing sieve N° 200 (0.075mm)

Response Time (RT)

Response Time will be 90 days.

Deductions

There will be a deduction of the availability payment when the presence of contaminated ballast is detected.

Adjustment factor

The Adjustment Factor for the Ballast indicator, F5, will be applied as follows, depending on the time between a nonconformity is detected and corrected:

Serious infringement	Misdemeanor
0.233*s	0.1*s
Time to compliance exceeds 50% of the RT.	Time to compliance is greater than the RT.

Where $s \in \{1, 2 \text{ or } 3\}$ is the number of sub-sections with noncompliances.

Penalties

The Contracting Administration may apply sanctions and fines to the contractor if compliance occurs after twice the response time (RT) counted from the moment the noncompliance is known.

3.3.4. Sleepers (Indicator 6)

The sleepers used for maintenance must be of the same type and comply with the same technical standards as those used for the construction of the railway. They must comply with the appropriate ALAF standard.

Sleepers for track switchers can be made of concrete or hardwood. However, all sleepers from the same track switcher or bridge, must be of the same material.

Sleepers must be installed perpendicular to the rails, properly spaced, compacted and fixed to the rail. They must have their top side in proper contact with the rail and its lower side under the rail bed in full contact with the ballast.

ALGORTA - FRAY BENTOS PPP

A concrete sleeper is out of tolerance when:

- it does not allow proper settlement of one of the rails or does not transfer vertical, lateral or longitudinal forces properly
- it is rotated or turned away from a position perpendicular to the rail in more than one and a half sexagesimal degrees
- It is broken or cracked under one or both rail beds
- It is broken, or cracked across the middle, showing signs of deterioration, loss of tension in prestressing wires, cables exposed, chipping, scaling, etc.
- It is longitudinally broken resulting in its incapacity for on-site support of one or both fixing inserts
- One or both inserts from a rail are loose, affecting some of the adjacent sleepers
- The sleeper has been damaged by a derailment and the Contracting Administration is of the opinion that it substantially affects its performance.

A wooden sleeper is out of tolerance when:

- it does not allow proper settlement of one of the rails or does not transfer vertical, lateral or longitudinal forces properly
- it is rotated or turned away from a position perpendicular to the rail in more than one and a half sexagesimal degrees
- it has a crack with a length equal to or greater than 15 cm and a depth equal to or greater than 4 cm
- there are cracks reaching the core or affecting the rail bed
- there is no chance to properly position the fastening or maintain the gauge.

Indicators

Quality of the sleepers will be monitored by three indicators:

- Number of sleepers out of tolerance every 1,000 m (not rail joint sleepers and not adjacent)
- Adjacent sleepers out of tolerance
- Number of rail joint sleepers out of tolerance

Threshold values

Threshold values of these indicators are as follows:



Indicators	Threshold
Number of sleepers out of tolerance every 1,000 m, which are not rail joint sleepers and which are not adjacent	20
Adjacent sleepers out of tolerance (*)	are not allowed
Number of rail joint sleepers out of tolerance (not applicable to welded rails) (*)	are not allowed

(*) In cases where this requisite is not met, precautions will be taken regarding speed restriction until the defect is corrected.

Response time

Response Time will be zero.

Deductions

There will be a deduction of the availability payment when one of the thresholds of the indicators used is exceeded.

Adjustment factor

The Adjustment Factor for the Sleepers indicator, F6, will be applied as follows, depending on the time between a nonconformity is detected and corrected:

Serious infringement	Misdemeanor
0.233*s	0.1*s
Time exceeds 75% of the noncompliance time indicated below, in the Penalties heading.	Since noncompliance is known

Where $s \in \{1, 2 \text{ or } 3\}$ is the number of sub-sections with noncompliances.

Penalties

The Contracting Administration may impose sanctions and fines to the Contractor Corporation if the solution time exceeds what is indicated in the following table:

Indicator	Noncompliance time
Number of sleepers out of tolerance every 1,000 m	120 days
Adjacent sleepers out of tolerance	48 hours
Rail joint sleepers out of tolerance (not applicable to welded rails)	48 hours

3.3.5. Rail and railway geometry (Indicator 7)

The rails used for maintenance must comply with the same technical standards as those used for the construction of the railway. They must comply with the appropriate ALAF standard.

Rails cannot be cut by using flame in any way (flame cutting, etc.). This includes all types of cuts that may be required, including opening holes. Rails must be cut only using mechanical saws or other appropriate grinding tools.

In all routine maintenance inspections, the status of the rails will be visually checked.

In the rail sections formed by welding more than one piece, none of the welded rails will be allowed to be less than 4 meters long.

Continuous inspection in search of internal defects will be carried out by the Contractor, using ultrasonic inspection techniques over the entire length of the rails at least once every 5 years.

Indicators

The quality indicators of track geometry are:

- Alignment tolerance. Alignment will be determined as follows:
 - On a straight track: it is the distance in the middle of a straight baseline between this and the actual position of the track used for measurement. The baseline is a straight 18.90-meter line, whose ends are placed in the rail in points to the side of the gauge, 14mm below the top of the rail's head. Both rails can be used to establish the length of 18.90 m from the baseline, however, the same rail must be used to control the overall length of a straight section.
 - On a curved track: it is the distance in the middle of a straight baseline between it and the actual position of the outer rail of the curve. The baseline is a straight 18.90-meter line, whose ends are placed in the outer rail of the curve, 14 mm below the top of the rail's head.
- Tolerance in the longitudinal leveling. It is measured as the standard deviation of the uniform longitudinal level measured in the average ordinate of an 18.90-meter line on either of both rails.
- Zero cross-level tolerance in a straight line or projected or anticipated cant in circular curves (between two transitions).
- Tolerance on projected or anticipated cant in transition curves.
- Cross-level variation in a straight line or circular curve (between two transition curves). It is measured as the cross-level difference between any two points separated by less than 18.90 m on straight or circular curves between two transition curves.



- Cross-level variation in transition curves. It is measured in the transition curves as cross-level variation measured between any two points separated 9.4m.
- Tolerable longitudinal level variations in alignment and leveling ramps for railway works or other temporary situations. The longitudinal level of the alignment and leveling ramps at the track raising end (or a railway raised due to other temporary reasons), will not vary, for each 9.45 m of rail, over the values in the table. These values apply to cases where the railway and accompanying ramp are adequately compacted, otherwise, a speed limit shall be set depending on the railway and ramp conditions.

Rail quality indicators are as follows:

- Rail vertical wear tolerance: It is measured as the decrease in height of the rail head in the vertical axis of its cross section, from the upper surface of the rail section without wear.
- Rail side wear tolerance: it is measured as the decrease of the rail head width measured from the inner side of the rail 16 mm below the rail top without wear.
- Tolerance to shoe wear (shoe width decrease due to wear and corrosion in the rail support surface on the sleeper)

Crushing of the end of the rail joint. It is measured as the decrease in height of the rail head measured at 12 mm from its end.

- Cracks and breaks: All cracks and breaks will be repaired immediately by changing the rail.
- Damages and defects in the running surface: All damages or defects on the running surface will be repaired immediately. The rail can be changed, or the damaged sector cut to be repaired with aluminum thermal welding, it can also be reprofiled or the contractor can use any other procedure approved by the Contracting Administration.

Threshold values

Threshold values for these indicators are determined by the ALAF standard. As an example, the current valid thresholds at the date of the bidding are:

Indicator	Threshold
Gauge tolerance	+30/ -5 mm
Alignment tolerance	47 mm
Longitudinal leveling tolerance	58 mm
Cross level tolerance	44 mm
Tolerance on the projected cant in transition curves	32 mm
Cross level variation	44 mm

ALGORTA - FRAY BENTOS PPP

Indicator		Threshold
Cross-level variation in transition curves		33 mm
Tolerance on gradients longitudinal level variation		55 mm
Rail vertical wear tolerance		10 mm
Rail lateral wear tolerance		12 mm
Shoe wear tolerance		6 mm
Tolerance on crushing of the end of the rail joint		6 mm
Cracks and breaks		It is not allowed
Damages or defects in the running surface		It is not allowed
Joints maximum span		19 mm
Tolerance on discontinuities at the rail tip	Vertical plane between the running surfaces	3 mm
	Inner gauge horizontal plane	3 mm

Response Time (RT)

The response time for correction is zero (equivalent to TR = 0), except for this indicator:

Indicator	Response time
Damages or defects in the running surface.	12 hours

Deductions

There will be a deduction of the availability payment when any indicator threshold whose response time is zero is exceeded, or when the correction for the indicator that has a positive response time, takes longer than the time set.

Adjustment factor

The Adjustment Factor for the rail and track geometry indicator, **F7**, will be applied as follows, depending on the time between a nonconformity is detected and corrected:



Serious infringement	Misdemeanor	Available
0.233*s	0.1*s	0
Time exceeds 75% of the noncompliance time indicated below, in the Penalties heading.	If time exceeds the RT. (Since the noncompliance is known, when T = 0.)	If the fault is corrected within the RT indicated.

Where $s \in \{1, 2 \text{ or } 3\}$ is the number of sub-sections with noncompliances.

Penalties

The Contracting Administration may impose sanctions and fines to the Contractor Corporation if the time to correct a nonconformity exceeds 120 days, except for what is indicated in the following table:

Indicator	Noncompliance time
Cracks and breaks	8 hours
Damages or defects in the running surface	24 hours

3.3.6. Joints and fasteners (Indicator 8)

Rail connections not made with aluminum thermal or butt welding, shall be connected with rail splices designed and built at the factory. Rail splices must not be altered by heating.

Connections between different profile rails must be made by welding rail sections (aluminum thermal or butt welding) or by using an appropriate combination of rail splices designed and forged at the factory.

Cracked or broken rail splices have to be replaced immediately. While the replacement is not made, train traffic is suspended on the segment and the availability indicator is affected.

The same process must be followed when rail splices allow any vertical movement of any of the rails relative to the other.

Each joint must be bolted with at least two fish bolts per rail correctly torqued to develop a tension between 110 and 130 Kilo-Newtons in the fish bolts.

All fish bolts have to be the proper size and material. Nuts have to be put against the pressure washers and at least one full thread of the threaded bolt should be left out of the nut.

Bolts have to be installed so that in one joint, those bolts alternate the position of the nut between the inside and outside of the track.

Poorly tightened bolts must be adjusted to the tension specified above. If the bolt cannot be adjusted or is missing or incomplete, it should be replaced by a new one in good condition.

ALGORTA - FRAY BENTOS PPP

A joint is out of tolerance when any one of the requirements stated above is not met. Depending on the type and extent of the flaw or malfunction, a speed restriction will be established or operations in the segment concerned will be temporarily suspended, affecting the availability indicator accordingly.

A fastener is out of tolerance when detected by visual inspection that it is decoupled or defectively tightened. The fastener is also considered out of tolerance if it has lost some of its parts or any are misplaced or damaged, in the view of the Contract Supervisor.

Indicators

The quality indicator for fasteners is the number of fasteners out of tolerance every 1,000 meters.

Threshold values

Threshold values of these indicators are as follows:

Subsystem	Indicator	Threshold
Fastener	Fasteners out of tolerance every 1 km, other than rail joint sleepers and which are not adjacent	10
	Number of rail joint sleepers fastenings out of tolerance (not applicable to welded rails) (*)	Adjacent sleepers with fasteners out of tolerance
	are not allowed	Adjacent sleepers with fasteners out of tolerance
Joints	are not allowed	are not allowed

Response time

Response Time will be zero.

Deductions

There will be a deduction of the availability payment when the threshold of the indicator used is exceeded.

Adjustment factor

The Adjustment Factor for the Joints and Fasteners indicator, **F8**, will be applied as follows, depending on the time between a nonconformity is detected and corrected:



Serious infringement	Misdemeanor
0.233*s	0.1*s
Time to correct the flaw exceeds 75% of the noncompliance time indicated below, in the Penalties heading.	Since the noncompliance is known

Where $s \in \{1, 2 \text{ or } 3\}$ is the number of sub-sections with noncompliances.

Penalties

The Contracting Administration may impose sanctions and fines to the Contractor Corporation if the time to correct the nonconformity exceeds what is indicated in the following table:

Subsystem	Indicator	Noncompliance time
Fastener	Fasteners out of tolerance every 1 km	120 days
	Number of rail joint sleepers out of tolerance	72 hours
	Adjacent sleepers with fasteners out of tolerance	48 hours
Joints	Joints out of tolerance	12 hours

3.3.7. Crossings and track switches (Indicator 9)

All materials used in track switchers have to comply with the following:

- Be designed and built at the factory
- Have the appropriate weight and cross section
- Be properly installed
- No cuts or holes made by flame cutting or similar procedures

Within the limits of the track switcher, the rails must be the same weight and section and interlaced or joint sleepers will not be allowed.

Indicators

The quality indicators used in this subsystem are:

- Crossings.
 - Wheel flangeway and check rail depth.
 - Wheel flangeway and check rail minimum width.

ALGORTA - FRAY BENTOS PPP

- Switch diamond wear. If the vertical wear of the switch diamond with respect to its original profile is greater than indicated, the common crossing is out of tolerance.
- Horizontal wear of the common crossing. It is out of tolerance if the length of wear of the affected section measured horizontally from the switch diamond is greater than indicated.
- Tread wear of the steel common crossing with respect to its original profile.
- Track switches.
 - Point of switch / stock rail adjustment: must be such as to allow the correct passage of the wheels through the point of switch with the point of switch placement in any of the closed positions. There is a failure when:
 - after the track switcher has been operated, the gap between the point of switch and the stock rail is greater than zero.
 - the switch can be operated (pulled) with a 6 mm caliber filed at the point of switch tongue.
 - Wheel / point of switch contact: it must be such that there is no contact between the extreme edge of the wheel tread and the side of the gauge point.
 - Stock rail vertical wear. Securing the point of switch heel. There will be a failure when the point of switch heel is incorrectly secured because any one of the parts has been damaged, improperly installed or missing. The track switch sleepers have to be properly compacted.
 - Point of switch and connecting rod attachment.
 - Track switcher bar lock: it must ensure that it can be operated with the lock or safeguard in place.
 - Visibility of position indicator
 - Point of switch wear. If the point of switch tongue is cracked, broken or worn more than the vertical wear allowed or it is affected by these faults in a length measured horizontally from the point of switch tongue greater than indicated, the point of switch is out of tolerance and must be repaired or replaced.
 - Switch flangeway depth.
- General track switchers
 - Sleepers compaction. It will be out of tolerance unless all track switcher sleepers are properly compacted.

Other flaws: The track switcher will be out of tolerance if it has other defects that prevent proper operation as: loose common crossing bolts, malfunctioning supports, alignment or leveling defects, loose, missing or damaged parts, lack of cleaning or lubrication, etc.



Threshold values

Threshold values of these indicators are as follows:

Subsystem	Indicator	Threshold
Crossings	Wheel flangeway and check rail minimum depth	41 mm
	Wheel flangeway and check rail minimum width	41 mm
	Maximum switch diamond wear with respect to its original profile	12 mm
	Common crossing horizontal wear. Maximum length measured horizontally with common crossing wear	150 mm
	Maximum tread wear of the steel common crossing with respect to its original profile	8 mm
Track switches	Number of failures of point of switch / stock rail adjustment	are not allowed
	Number of failures wheel / point of switch contact	are not allowed
	Stock rail vertical wear	4 mm
	Point of switch vertical wear	12 mm
	Maximum distance with wear, measured horizontally from the point of switch tongue	150 mm
	Number of failures in securing point of switch heel	are not allowed
	Number of failures in point of switch and connecting rod attachment	are not allowed
	Number of failures of the track switcher bar lock	are not allowed
	Number of visibility failures of the position indicator	are not allowed
	Switch flangeway minimum depth	55 mm
Track switcher	Defective sleepers compaction	are not allowed
	Other flaws	are not allowed

Response time

Response Time will be zero.

Deductions

There will be a deduction of the availability payment when one of the thresholds of the indicators used is exceeded.

ALGORTA - FRAY BENTOS PPP

If the flaw poses any risk to the operation and it is determined that there cannot be any train traffic, it will be treated as an availability flaw (Indicator 1).

Adjustment factor

The Adjustment Factor for the Crossings and track switches indicator, **F9**, will be applied as follows, depending on the time between a nonconformity is detected and corrected:

Unavailable	Serious infringement	Misdemeanor
s/3	0.233*s	0.1*s
Exceed 28 days without correction	Exceed 14 days without correction	Since the noncompliance is known

Where $s \in \{1, 2 \text{ or } 3\}$ is the number of sub-sections with noncompliances.

Penalties

The Contracting Administration may impose sanctions and fines to the Contractor Corporation if the time to correct the nonconformity exceeds 1 month since the noncompliance is known.

3.3.8. Platform cleaning (Indicator 10)

Demanded standards

The platform and its surroundings must be kept clean of vegetation to ensure safe railway operation.

Vegetation must be controlled so that:

- It does not grow within the ballast section or obstructs the ballast drainage
- It does not interfere with proper visibility at level crossings
- It does not obstruct the kilometer posts, signs, railway signals in general, among others
- It does not obstruct drainages
- It does not interfere with the safe operation of trains
- It does not prevent or significantly hinder the inspection of the railway and works of art
- It does not present a risk of fire that may affect wooden railway structures or other materials that may be affected by fire
- It is not in contact with the rolling stock (tractive and towed). Overall, it does not invade the track gauge

The required conditions are such that the height of vegetation should not affect rail safety by decreasing visibility or hiding signaling.



The platform cleaning indicator is the response time of the various actions to correct obstructions.

Any condition or obstruction of the railway will affect availability (Indicator 1).

Response Time (RT)

The values for the response times of each item are as follows:

Item	Value
Control or eradication of vegetation when it interferes with visibility or safe operation of trains	24 h.
Vegetation control in the other required situations	7 days

Deduction

Deduction of the availability payment for the platform Cleaning indicator will be applicable if the response time set is exceeded.

Adjustment factor

The Adjustment Factor for the platform Cleaning indicator, **F10**, will be applied as follows, depending on the time between a nonconformity is detected and corrected:

Serious infringement	Misdemeanor	Available
0.233*s	0.1*s	0
The solution is implemented after 3 times the RT defined.	The solution is implemented after the RT defined.	The solution is implemented within the RT defined.

Where $s \in \{1, 2 \text{ or } 3\}$ is the number of sub-sections with noncompliances.

Penalties

The Contracting Administration may impose sanctions and fines to the Contractor Corporation if the time to correct the nonconformity exceeds what is indicated in the following table:

Item	Value
Control or eradication of vegetation when it interferes with visibility or safe operation of trains	72 hours
Vegetation control in the other required situations	30 days

ALGORTA - FRAY BENTOS PPP

3.3.9. Track switch and signaling operation (Indicator 11)

Demanded standards

All signaling elements located in the section must be maintained in visibility conditions to ensure safe railway operation.

Visibility of the signals is out of tolerance when these are not properly visible at the right distance for the crew of a train running under proper operating conditions.

All mechanical signals and interlocking track switch systems must be kept in running condition.

A mechanical signal or a track switcher system is out of tolerance when it does not operate correctly.

The signal visibility indicator is the response time of the various actions to correct visibility flaws.

The signal and track switch operation indicator is the response time of the various actions to correct system flaws.

Response time

Response Time will be zero.

Deduction

There will be a deduction of the availability payment since the noncompliance is known.

Adjustment factor

The Adjustment Factor for the Signaling indicator, **F11**, will be applied as follows, depending on the time between a nonconformity is detected and corrected:

Unavailable	Serious infringement	Misdemeanor
s/3	0.233*s	0.1*s
Signal visibility: Exceed 24 hours in case of danger Signal visibility: Exceed 10 days if there is no danger Track switch and signaling operation: exceed 24 hours	Signal visibility: Exceed 12 hours in case of danger Signal visibility: Exceed 5 days if there is no danger Track switch and signaling operation: exceed 12 hours	Since the noncompliance is known

Where **s** ∈ {1, 2 or 3} is the number of sub-sections with noncompliances.



Penalties

The Contracting Administration may impose sanctions and fines to the Contractor Corporation if the time to correct the nonconformity exceeds what is indicated in the following table:

Item	Noncompliance time
Signal visibility. If defects or damages detected pose a danger and could affect safety	36 hours
Signal visibility. If defects or damages detected do not pose a danger and could affect safety	15 days
Track switch and signaling operation	48 hours

3.3.10. Level crossings (Indicator 12)

Level crossings are out of tolerance when:

- Drains are not properly installed or maintained free of debris.
- Water stagnates on the road in the level crossing or in an area near the railway.
- The width of the throat between the rail and the check rail is less than 50 mm or greater than 75 mm.
- The depth of the throat between the rail and the check rail is less than 50 mm or greater than 75 mm.
- The throat is obstructed with material beyond the minimum width and depth values set.
- When inside the level crossing or within 6 meters on each side, one of the sleepers or its fastenings is out of tolerance.
- Where there is a splice joint within the level crossing or within 6 meters on each side.
- When the pavement or road surface on the level crossing is defective or not at the same height as the rails.
- When the state or the maintenance of electrical or electromechanical protection systems and level crossing signaling has flaws or does not comply with the manufacturer's recommendations, or security conditions required by current legislation and regulations.
- When it has been over a month since the last level crossing protection system maintenance inspections.

ALGORTA - FRAY BENTOS PPP

- When the last level crossing hazard index assessment exceeds a year.
- When the level crossing hazard protection index indicates another safer system must be used.

In all cases the necessary restrictions or security measures will be applied and, if deemed unsafe for trains, availability will be affected (Indicator 1).

Response Time (RT)

Values of response time to correct level crossings that are out of tolerance are:

Item	Value
When it refers to elements other than the protection system	4 hours
When the protection system must be changed	Null

Adjustment factor

The Adjustment Factor for the Level crossings indicator, **F12**, will be applied as follows, depending on the time between a nonconformity is detected and corrected:

	Serious infringement	Misdemeanor	Available
	0.233*s	0.1*s	0
Elements other than the protection system	Time was greater than 18 hours	Time was greater than RT, minus 18 hours.	Time was less than the RT.
Change the protection	Time was greater than 60 days.	Since nonconformity is detected.	Does not apply

Where $s \in \{1, 2 \text{ or } 3\}$ is the number of sub-sections with noncompliances.

Penalties

The Contracting Administration may impose sanctions and fines to the Contractor Corporation if the time to correct the nonconformity exceeds what is indicated in the following table:

Item	Value
When the level crossing is out of tolerance but its protection system does not need to be changed.	24 hours
When the level crossing is out of tolerance and its protection system must be changed.	120 days



3.4. Infrastructure Comprehensive Management (Indicator 13)

According to Chapter 4 below, the monitoring and survey activities will result in the timely updating of databases, as well as monitoring reports. Monitoring reports include standardized forms incorporating all the information requested. Information must be submitted to the Contract Supervisor in editable digital format (text and electronic spreadsheet).

Indicators

There should be no delays in updating databases, in carrying out monitoring and survey activities or in the reports the Contractor Corporation is required to submit.

- The deadline for updating the database is one week after the last day for the registration in the event.
- The deadlines for carrying out monitoring and survey activities are indicated in Chapter 4 of these Technical Specifications.
- Monitoring reports must be delivered within a week after the day the survey activities are completed.

Only monitoring and survey activities the Contract Supervisor has been notified of, as indicated in Chapter 4 of these Technical Specifications, will be considered for this indicator.

Response time

Response Times are zero.

Deductions

Deductions will be applied in case of delays in updating databases, in carrying out monitoring and survey activities or in the reports the Contractor Corporation is required to submit.

The time for deductions applied to reports will be:

- If the survey activity ended within the time frame set:
 - The days from the report deadline to the survey activity deadline, minus seven.
- If the survey activity ended after the time frame set:
 - The days from the report deadline to the survey activity deadline.

Adjustment factor

The Adjustment Factor for the Comprehensive management indicator, **F13**, will be applied as follows:

ALGORTA - FRAY BENTOS PPP

Serious infringement	Misdemeanor	Available
0.3	0.1	0
If there are four or more delays for this indicator in a period of 180 days.	If there are one to three delays for this indicator in a period of 180 days.	Does not apply.

Penalties

The Contracting Administration may impose sanctions and fines to the Contractor Corporation if the time to update the database or submit a report exceeds four weeks since the noncompliance started.

4. CONTRACTOR'S OBLIGATIONS IN THE INFRASTRUCTURE COMPREHENSIVE MANAGEMENT

During the operation of the infrastructure conservation, works modify the state of the railway elements and the environment. Therefore, knowledge of the activity performed on an element should be complemented by measuring the effect of that activity on the element. This requires starting from an initial situation and assessing the changes in each element, as a result of conservation actions.

The contract comprehensive management has three elements:

- Development and maintenance of a geo-referenced database
- Monitoring and recognition of the state of infrastructure
- Monitoring reports

4.1. Databases

Demanded standards

The Contractor has the initial basic obligation to have a comprehensive inventory of all railway elements and their environment. This inventory should be the most effective tool for making the mandatory annual programs.

The Contractor must implement a Geographic Information System. That Geographic Information System will have the following data referenced:

- Inventory and systematic updates of railway infrastructure
- Network effects (incidents, accidents and other events)
- Indicators management
- Operation comprehensive management
- Conservation and maintenance management system



Additionally, the Contractor Corporation must prepare a report for each incident on the network. Such reports, the information in monitoring activities, as well as all the actions taken and planned, should be incorporated into the database associated with the contract. Among the actions planned are the scheduled maintenance activities.

This database should be kept updated throughout the contract. In the event that the database associated with the contract will not be timely updated, deductions will be applied as indicated in section 3.4.

The update deadline is two weeks after the last day for registration in the event.

4.2. Monitoring and survey of the state of infrastructure

Demanded standards

Regular records should be based primarily on measurable parameters, whenever possible with continuous measurement systems and data loggers. Visual and subjective criteria should be avoided, which can easily be replaced by digital optical media and instrumentation or monitoring if the need arises.

In any case, the Contractor Corporation must have the necessary means to perform the appropriate measurements and maintenance having measuring instruments in perfect condition and calibrated by an approved laboratory. Regular quality controls will be done to those functional subsystems or sets whose quality can be objectively determined.

Quality controls, examination, walking and driver's cab tours must not affect the availability of infrastructure and in no case should they be considered as grounds for exceptions to the obligation of having the railway available.

The Contractor Corporation is required to inform the Contract Supervisor, with at least 4 days in advance, the date and time they will perform the quality checks referred to in this section. The Contract Supervisor, or the person appointed, may accompany the Contractor Corporation staff when performing such activities.

- **Examination.** A series of exams of the facilities subject of this contract must be programmed with the minimum frequency indicated below: The aspects to consider will be:
 - Railway examination: Examination will be carried out to the entire layout of the track in order to detect and control a number of parameters concerning at least: curved track wear, straight track wear, rail status, track geometry, platform fasteners, welding and corrugation.
 - Detours examination: Examination will be carried out to the entire layout of the track in order to detect and control a number of parameters concerning at least: wear of the mechanical elements of the detour, tightening and clearance elements of switches and crossings, detours geometry, detours overall status (grease, cleaning, etc.), safety headroom, proper functioning of detours.

ALGORTA - FRAY BENTOS PPP

- **Civil work examination:** The following aspects of the civil work must be examined: general status of the platform, railway drains, switches and crossings drains, shoulders, pavement, works of art and urbanization elements.

Examination results are recorded in standardized forms where operations are recorded for monitoring and designing purposes, as well as basic data for the design of maintenance activities.

Examination	Frequency
Railway examination	Biannually
Detours examination	Biannually
Civil work examination	Biannually

- **Walking tours.** A series of walking tours by the specialized staff of the Contractor Corporation must be programmed with the minimum frequency indicated below: On these walking tours all aspects that could have an impact on the normal development of the operation, will be checked. In particular, the following railway elements will be monitored and reported:
 - Ballast: state, pollution, presence of herbs, shoulder dimensions
 - Sleepers: state, cracks, damage from railway machinery, squaring
 - Fasteners: state, correct positioning and operation
 - Rail: state, surface defects, cracks, faulty joints

The following will be inspected in detail, with the minimum frequency indicated below: the state of earth moving works, nets, jetties, protection elements, retaining walls, level crossings, drainages and sanitizing actions.

Examination results are recorded in standardized forms for monitoring and designing purposes, as well as basic data for the design of maintenance activities.

Examination	Frequency
Walking tours (railways and platform)	Quarterly
Walking tours (civil work)	Quarterly



- **Driver's cab tours.** A series of driver's cab tours in a commercial train by the specialized staff of the Contractor Corporation must be programmed with the minimum frequency indicated below: For such purposes, a person will be appointed at least one week in advance, who shall inform the person responsible at the State Railways Administration of Uruguay and apply for the proper permit.

Observations of the driver's cab tours are recorded in standardized forms for monitoring and designing purposes, as well as basic data for the design of maintenance activities.

Examination	Frequency
Driver's cab tours	Monthly

4.3. Monitoring reports

Actions before incidents and events, as well as monitoring activities mentioned in this chapter will lead to monitoring reports. Monitoring reports will include standardized forms incorporating all the information requested. Information must be submitted to the Contract Supervisor in editable digital format (text and electronic spreadsheet).

Monitoring reports must be delivered within a week after the day of their completion.

The checks referred to in this chapter are independent of external audits conducted to determine the status of all facilities in accordance with the maintenance control parameters and their life cycle phase, among others.

Spanish version is the only legally binding document

5. ANNEXES

ANNEX A - TECHNICAL SPECIFICATIONS FOR RAILWAY BALLAST

ANNEX B - SPECIFICATIONS FOR THE PROTECTION OF LEVEL CROSSINGS

ANNEX C - TECHNICAL STANDARDS FOR THE DESIGN AND
CALCULATION OF RAILWAY BRIDGES

ANNEX D - TECHNICAL SPECIFICATIONS FOR THE COMMISSIONING OF
THE INFRASTRUCTURE

Spanish version is the only legally binding document