CENTRAL RAILWAY

ANNEX Q

Maintenance Standards for Railways of the New Terminal Station and secondary railways

December 2017

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1. Dismantling of existing railway, classification, transfer and storage of materials.

1.1 Dismantling the existing railway

The materials recovered from the disarmament of the railway between Montevideo and Paso de los Toros as well as the existing new rails deposited in the track area will be transferred to the Rio Branco Line to be placed from km 26 (Toledo) to 334 (Treinta y Three), and to other destinations according to what is indicated in Tables 1 and 2.

Table 1

Rails	Destination	Observations
Between km 0.555 and 145 there will be 128km of track with UIC50 rails and 9 km of track with U36 rails produced from the track in the Montevideo - Pintado section The approximately 11 km of the route of the current layout between the start of the By-Pass in Margat and the end of it in the southern head of the Santa Lucia Bridge are not dismantled and will remain in the current conditions connected to the new railway by means of two separate detour devices at both ends Between Montevideo and km 8 there is currently a double track.	Rio Branco 26 to 157 km	They move sections armed with sleepers. Storage in Stations indicated in Table 2 and in accordance with the provisions of the Contract Supervisor. The sections of track with rails U36 will be collected in Cerro Colorado station
14 km railway with R50 rails produced from 142 to 145 km and from 197 to 208 km	Rio Branco 157 to 171 km	They move sections armed with sleepers. Storage in Mansavillagra Station according to what is indicated by the Contract Supervisor.
234 km new rails BS100A of 50 kg / m. (they are loose deposited along the railway from km 145 to km 273) They allow to renew 117 km of track	Rio Branco 173 al 288 km	Rails are moved alone They are deposited distributed along the section on the side of the railway according to the instructions of the Supervisor of the contract.
52 km track with rails of 80 lbs / yd produced from km 145 to km 197 A reserve of 6 km of track for branch lines is envisaged	Rio Branco km 288 al 334	Armored sections are transported with steel sleepers and are assembled in Varela and Treinta y Tres Stations according to what was indicated by the Contract Supervisor.
65 km track with tracks of 80 lbs / yd produced from Durazno (km 208) to Paso de los Toros (km 273).	The railway is dismantled and the materials are classified according to whether they are reusable or not	The recovered sleepers are classified and 60% is stored (estimated recoverable) at the Nico Pérez Station (km 230) and the remaining 40% is stored at Molles Station. These activities will be carried out according to the provisions of the Contract Supervisor. The rails are classified and assembled in Molles Station (km 245) according to the provisions of the Supervisor of the contract. In this section there is 1.15 km of track installed with BS100 rails. The armed sections will be moved and will be stored in the José Pedro Varela Station according to what the Supervisor of the Contract indicates.

Table 2

Station	Progressive	Amount to be stored in km of track
Santa Rosa	29	12
Cazot	37	7
Castellanos	45	40
San Ramón	56	10
Fray Marcos	81	20
Casupá	95	15
Reboledo	107	20
Cerro Colorado	128	10
Mansavillagra	156	11

1.2 Dismantling of track equipment

The existing track equipment can be transported whole, by parts or disassembled depending on the chosen transport system. If they are transported by parts or disassembled they must be correctly numbered and related for their subsequent identification and assembly in the stations of the Rio Branco Line detailed below.

The Track Equipment (ADV) produced must be identified and registered in a database (incorporated into a digital record) that will be delivered to the Contract Supervisor. They must be disarmed by sections (Needle, Intermediate, and Crossing). Detailing hand, angle and accessories if disarmed, identifying on the rail with paint the location of each of the sleepers, numbering and writing the number of each sleeper in the soul of the rail. Cutting of any element of the system is prohibited

Track equipment (ADV) resulting from disarmament in Stations during the Work are detailed in Table 3

Table 3- Track equipment for producing (recovering) the dismantling of the existing track.

Origin Station	Amount of ADV to recover	Type of rail
New terminal of passengers	7	UIC50
Carnelli	10	UIC50
KM 7	5	UIC50
Sayago	4	UIC50
Peñarol	4	UIC50
Colón	4	U36
Abayubá	2	U36
Las Piedras	4	U36
Progreso	2	UIC50

Origin Station	Amount of ADV to recover	Type of rail
Canelones	5	UIC50
25 de Agosto	6	UIC50
25 de Mayo	2	UIC50
Florida	6	UIC50
Durazno	4	UIC50

Track equipment with profile rails UIC 50 and U36 produced from disarmament will be distributed according to the following criteria:

- First classify according to your hand among those that will be used in the renewal of the secondary railways of the stations (see next chapter) and those that do not go to this use will be transferred to the Rio Branco line.
- The equipment to be moved to the Rio Branco Line will be stored at the stations indicated in Table 4, according to the necessary hand in each Station, completing the amounts defined in Table 4

Table 4. Distribution of ADVs in the Rio Branco Line

Station	Km	Amount of ADV
San Ramón	82,229	4
Cerro Colorado	153,511	2
Illescas	204,304	2
Nico Pérez	230,298	7
José Pedro Varela	304,160	5
Treinta y Tres	334,480	5

The rest of the Track equipment coming from the disarmament of the tracks between Montevideo and Paso de los Toros will be disarmed, classified and stored at Nico Pérez and Paso de los Toros stations according to the provisions of the Contract Supervisor.

All other elements coming from the disarming of the road (fixings, rail lubricators, signals, etc.) will be transferred and stored at the Nico Pérez and Paso de los Toros stations, according to what the Contract Supervisor indicates.

1.3 Dismantling of the components of the metallic structure of the existing bridges, transport, storage and distribution of the materials to be recovered.

The metallic structure of the bridges that are not reinforced will be dismantled into transportable parts that will be identified and numbered in such a way that in the future they can be assembled again according to what the Contract Supervisor indicates and will be stored in the nearest one of the following stations: August 25, Nico Pérez and Paso de los Toros

2. Rehabilitation of secondary railways in stations

2.1 Scope

The secondary railways indicated in blue line in the Road Plans of Annex E, must be reconstructed and maintained according to the criteria established in this document. They correspond to the following stations:

Station
Carnelli
KM 7
Peñarol
Canelones
25 de Agosto
Florida
Durazno

The railways of the New Terminal, indicated in green line in the corresponding plan of Annex E, must be maintained during the term of the contract according to the criteria established in this document.

The Bidder may consider the possibility that the railways indicated in green stroke of the New Terminal are improved without performing a total reconstruction, replacing only some of its elements (sleepers, fixings, etc.), adjusting the geometry of existing railways and performing other tasks necessary.

In any case, it is up to the bidder to consider the scope of the proposal for the rehabilitation of the aforementioned railways of the new Terminal, bearing in mind that it will have to face up to its maintenance during the contractual period based on the requirements established later in this document.

It is important to bear in mind that all the railways of the New Terminal should be incorporated into the signalling system and CTC of the project as specified in Annex M.

2.2 Materials for the mounting and assembly of the secondary roads at the Carnelli, Km 7, Peñarol, Canelones, 25 de Agosto, Florida y Durazno stations.

All materials recovered from the dismantling of the existing railway that are used in the secondary railways of the stations will be selected according to what is arranged by the Contract Supervisor

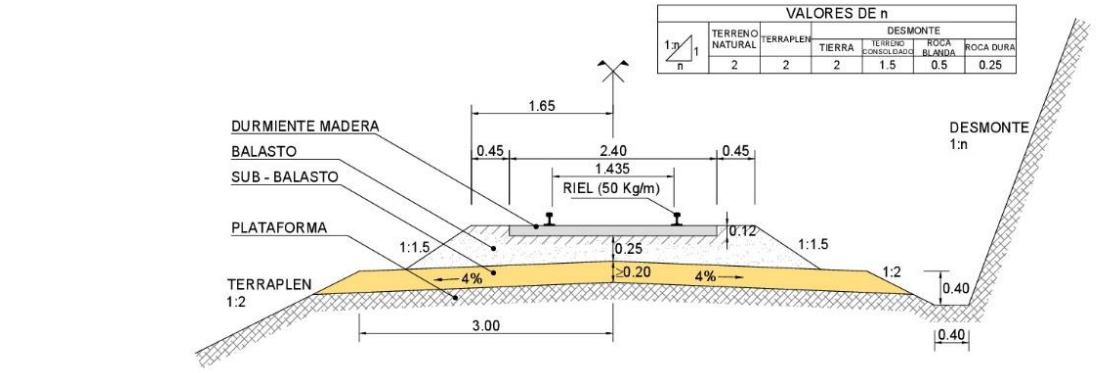
2.3 Structure of secondary railways.

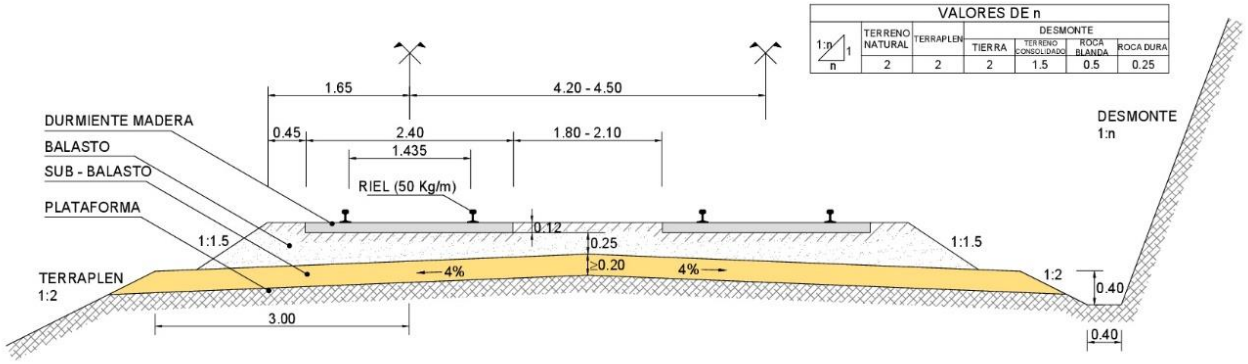
The structure of the secondary railways will be designed for a maximum speed of 40 Km / h and a maximum load of 22.5 Tons per axis

The structure of the secondary railways will be constituted by the following elements:

- UIC 50 rails recovered from dismantling the existing track with joints every 18 or 36 meters

- Hard wood sleepers recovered from the dismantling of the existing track or concrete separated by a maximum of 61 centimetres. The separations between section and joint sleepers will be established in the executive project.
- Rigid fastening by means of lag screws (new or recovered) or elastic ones to be proposed by the Bidder. In the New Terminal the existing elastic fastening will be maintained.
- A ballast layer, with a minimum thickness of 25 centimetres under the sleeper, with the same requirements as for the main railway.
- A layer of Sub ballast, with a minimum thickness of 20 centimetres and with the same requirements as for the main railway.
- Drainage system (ditches, culverts, longitudinal and transversal drains, etc.) to ensure proper evacuation of rainwater according to the contractor's project approved by the Contract Supervisor.
- Type UIC 50 track equipment recovered from dismantling existing stations with manual operation and with hardwood sleepers also recovered from disarmament. In the New Terminal you can reuse existing one.
- The technical specifications of the ballast, sub-ballast and sub-base will be the same as those established for the main railway in Annexes A, B and D.
- The cross section of the secondary railways will be the following:





3. Maintenance needed for secondary railways

This document establishes the minimum standards and technical requirements for secondary roads that do not fall within the scope of the project's maintenance standards. These tracks are shown on the blue colour track maps

This document also establishes the minimum standards and technical requirements for the railways of the New Terminal, which must have a high level of maintenance, because faults in the passenger terminal can affect train schedules throughout the metropolitan area. In this document, the area of the New Terminal is from the station to the level crossing at Francisco Tajes Street, approximately km 1 + 220. The railways are shown in a green plane.

The obligations established in annex C "Maintenance standards" are valid. With the adjustments that are established later in this document.

For the railways of the New Terminal it will be understood that the thresholds of the availability indicators of the Technical Bases correspond to the intervention limits established in this document

4. Infrastructure management

The management of the railways of the New Terminal and the secondary roads of other stations must be included in the management of the infrastructure that is established in Annex C "Maintenance standards

5. Safety, quality and environmental requirements for maintenance

The safety, quality and environmental requirements for the railways of the New Terminal and the secondary railways must be included as established in Annex C "Maintenance standards"

6. Scope of Maintenance

The scope of the maintenance works must be as established in annex C "Maintenance standards".

7. Implementation of track infrastructure maintenance

7.1 Maintenance levels

It will be carried out in accordance with the provisions of ANNEX C "Maintenance standards".

7.2 Response times

The response time for the railways of the New Terminal and the other secondary roads are shown in table 5

Table 5 ï Response time

	Class 1 Missing	Class 2 Missing
New Terminal Area	90 min	240 min
Secondary Roads	180 min	2 days

7.3 Measurements and inspections

7.3.1 Frequency of Measurements and Inspections

Requirements according to what is established in annex C "Maintenance standards".

7.3.2 Measurements of track geometry

Requirements according to what is established in annex C "Maintenance standards".

7.3.3 Switches Measurements and inspections

Requirements according to what is established in annex C "Maintenance standards".

7.3.4 Rail inspection

Requirements according to what is established in annex C "Maintenance standards".

7.3.5 Bridges inspection

Requirements according to what is established in annex C "Maintenance standards".

7.3.6 Signalling System Inspection

Requirements according to what is established in annex C "Maintenance standards".

7.3.7 Walk through Inspections

Requirements according to what is established in annex C "Maintenance standards".

7.4 Maintenance management

Requirements according to what is established in annex C "Maintenance standards".

7.5 Preventive maintenance

Requirements according to what is established in annex C "Maintenance standards"

7.6 Procedures for the most critical deviations.

Requirements according to what is established in annex C "Maintenance standards"

8. Requirements for the quality standards of the track

8.1 Maintenance actions

There are three limits of maintenance actions established in table 6 and explained in annex C "Maintenance standards".

Table 6. Limits of maintenance actions

Alert limit	The alert limit values are not requirements for: • The railways of the New Terminal • The secondary railways
Intervention limit	The intervention limit values are requirements for: • The railways of the New Terminal • The secondary railways
Immediate action limit	No deviation to Annex C "Maintenance standards" for the railways of the New Terminal or secondary roads. These immediate action limits are the minimum level for safe train traffic, according to the technical specifications of interoperability (TSI INF)

8.2 Structure gauge

Requirements according to what is established in annex C "Maintenance standards"

8.3 Railway geometry

8.3.1 General

Rail joints must be properly maintained so that safe traffic can be guaranteed and rail joints do not cause damage to the rolling stock. It will be verified that the light in each one of the joints is the correct one according to the prevailing temperature and that the bolts of the fish plates are with the correct tightness.

8.3.2 Tamping

Requirements according to what is established in annex C "Maintenance standards".

8.3.3 Trail (track width)

The maximum and minimum gauge values are established in Tables 7 and 8

Table 7 ï Nominal Track Width to peak value (in mm)

	Minimum	Maximum
Alert limit	-	-
Intervention limit	-10	+32
Immediate action limit	-11	+35

Table 8 ï Track width Nominal to average track width over 100 m (in mm)

	Minimum	Maximum
Alert limit	-	-
Intervention limit	-7	+30
Immediate action limit	-8	+32

8.3.4 Track horizontal alignment

The maximum values of track alignment are established in Table.

Table 9. Alignment ï Isolated defects - Average to peak value (in mm)

	Average to peak value (in mm)
	Wave length 5 m (D1)
Alert limit	-
Intervention limit	18
Immediate action limit	22

8.3.5 Longitudinal track level

The maximum values of the longitudinal track levels are indicated in Table 10 and the standard deviation in Table 11

Table 10. Longitudinal level ï Isolated defects - Average to peak value (in mm)

	Average to peak value (in mm)
	Wave length 5 m (D1)
Alert limit	-
Intervention limit	22
Immediate action limit	28

Table 11. Longitudinal level ï Standard deviation

	Standard deviation (mm)
	Wave length 5 m (D1)
Alert limit	-
Intervention limit	2,1
Immediate action limit	1,8

8.3.6 Track twist

The maximum track twist values are established in table 12

Table 12. Maximum twist values - Isolated defects - Zero to peak value (ă = 3 m)

	Maximum (mm)
Alert limit	-
Intervention limit	6
Immediate action limit	7

8.3.7 Transverse levelling

The maximum superelevation values are set in Table 13.

Table 13. Maximum values for superelevation

	Maximum (mm)
Alert limit	-
Intervention limit	17
Immediate action limit	20

8.3.8 Equivalent conicity in service

Requirements according to what is established in annex C "Maintenance standards".

8.4 Track and crossing equipment

Requirements according to what is established in annex C "Maintenance standards".

8.4.1 Free wheel passage in switches

The maximum values of the wheel passage in track equipment are established in table 14

Table 14. Free wheel passage in track equipment

	Maximum (mm)
Alert limit	-
Intervention limit	1.377
Immediate action limit	1.380

8.4.2 Fixed nose protection

The minimum values of the fixed nose protection are established in Table 15.

Table 15. Fixed-nose protection

	Maximum (mm)
Alert limit	-
Intervention limit	1.395
Immediate action limit	1.392

8.4.3 Free Wheel passage at crossing nose

The maximum values of the freewheel passage at the crossing nose are set forth in Table 16.

Table 16 Free Wheel passage at crossing nose

	Maximum (mm)
Alert limit	-

	Maximum (mm)
Intervention limit	1.353
Immediate action limit	1.356

8.4.4 Free Wheel passage at check rail/ wing rail entry

The maximum values of the freewheel passage at check rail are set forth in Table 15.

Table1. Free Wheel passage at check rail / wing rail entry

	Maximum (mm)
Alert limit	-
Intervention limit	1.377
Immediate action limit	1.380

8.4.5 Minimum Flangeway Width

The minimum value of the flangeway width should be 38mm (INF TSI).

Table 17. Minimum Flangeway Width

	Maximum (mm)
Alert limit	-
Intervention limit	40
Immediate action limit	38

8.4.6 Minimum flangeway depth

The minimum value of the flangeway depth must be 40 mm (INF TSI)

Table2. Minimum flangeway depth

	Minimum (mm)
Alert limit	-
Intervention limit	41
Immediate action limit	40

8.4.7 Height of check rail

The maximum height of check rail is 70mm (INF TSI)

Table 19. Maximum height of check rails

	Maximum (mm)
Alert limit	-
Intervention limit	63
Immediate action limit	70

8.5 Track superstructure

8.5.1 Rails

Requirements according to what is established in annex C "Maintenance standards".

8.5.2 Fasteners

Requirements according to what is established in annex C "Maintenance standards".

8.5.3 Sleepers

Requirements according to what is established in annex C "Maintenance standards".

8.5.4 Ballast

Requirements according to what is established in annex C "Maintenance standards".

8.6 Bridges and culverts

Requirements according to what is established in annex C "Maintenance standards".

8.7 Level crossings

Requirements according to what is established in annex C "Maintenance standards".

8.8 Signalling system

Requirements according to what is established in annex C "Maintenance standards".

9. Maintenance resources

Requirements according to what is established in annex C "Maintenance standards".