

Ordinance to Regulate n° 3/2005  
of May 10

The Law n° 33/2004, of July 28, turns obligatory the protections placement in the existent road restraint systems in "black spots" and in other spots of larger risk of the public roads, integrated or not in the national road net, contemplating the perspective for the users of powered two-wheeled vehicles (PTW - motorcycles, scooters and mopeds).

In the terms of the referred diploma, the protections should be putted in the roads to build, in the whole extension of the respective road restraint systems.

With effect, the road restraint systems, when failed to protect, they can constitute danger for those users, especially for the motorcyclists.

By the present ordinance, the Government proceeds to the necessary regulation for the full applicability of the Law n° 33/2004, of July 28, establishing, namely, the standards of placement of the protections in road restraint systems and the rules for its installation.

Like this:

In the terms of the 7<sup>th</sup> article of the Law n° 33/2004, of July 28, and of the paragraph c) of the 199<sup>th</sup> article of the Constitution, the Government decrees the following:

1<sup>st</sup> Article  
Goal

The present diploma establishes the standards for the protections placement in existent road restraint systems in the public roads, integrated or not in the national road net, contemplating the safety's perspective of the users of vehicles of powered two wheels.

2<sup>nd</sup> Article  
Concepts

For effects of the determination in the Law n° 33/2004, of July 28, and in the present it graduates, he/she understands each other for:

- a) "Protection device" the device intended to contemplate the safety of the users of vehicles of powered two wheels, manufactured with respect of the determination in the articles 3<sup>rd</sup> to 5<sup>th</sup> of the present ordinance, of the continuous panel type or similar device, to install in the road restraint systems of the roads;
- b) "Metallic type protections device" the continuous device intended to the protection of the users of powered two-wheeled;
- c) "Black spot" throws of a road with a maximum of 200 m of extension, in which were recorded, at least, five accidents with victims, the year in analysis, whose sum of gravity indicators is superior to 20. The value of the gravity indicator (IG) for each accident it is obtained through the formula  $IG = 100 \times (\text{number of deaths}) + 10 \times (\text{number of serious wounded}) + 3 \times (\text{number of light wounded})$ ;
- d) "Curves from inferior ray to the normal minimum" the curved alignment in plant, usually constituted by a circular curve and two transition curves, but could have other composition, whose ray of the circular curve is inferior to the normal minimum ray (RN) stipulated in the picture, that is as enclosed I of the present diploma and that of him it is integral part, whose values flow of the picture VII of the standard "Norma de Traçado JAE P3/94", of the extinct Junta Autónoma das Estradas;
- e) "Curves with inferior superelevation to demanded" the curved alignment in plant, usually constituted by a circular curve and two transition curves, but could have other composition, whose superelevation of the circular curve is inferior to the established in the picture, that is as enclosure II of

the present diploma and that of him it is integral part, which flows of the picture XVII of the plan norm JAE P3/94, of the extinct Junta Autónoma das Estradas;

f) "Curves with reduced ray" same as "curve of inferior ray to the normal minimum", as defined in the paragraph c) of the present article;

g) "Area with skidding" danger the road passage whose pavement is in sidewalk of natural stone or whose superficial layer presents coefficient of inferior traverse attrition to 0,35 when measured in a continuous way, with wet floor, preferentially through equipment type SCRIM, according to the standard of constant test of the enclosure III of the present diploma and that of him is integral part. It is admitted other equipment types for measurement of the attrition coefficient in continuous, since the expressed conditions are respected in the referred enclosure.

In alternative, it can be considered the coefficient of punctual attrition, measured through tests with a rocking pendulum, according to standard EN 13036-4:2003 (Characteristics of surface of roads and aerodromes - Test Methods - Part 4: Method for measurement of the resistance to the sliding of a surface - The pendulum test). It will be considered that it is treated of an area with skidding danger if the value medium PTV corrected obtained goes inferior to 35 units;

h) "Enough width for slowing down of vehicles" the marginal extension to the platform of the road free from obstacles, that allows the slowing down of vehicles of two powered-wheels in case of accident, with the following width:

i) 9 m in freeways and highways with base speed superior to 100 km/h;

ii) 6 m in roads with base speed larger or equal to 80 km/h and inferior or equal to 100 km/h;

iii) 5 m in roads in that the base speed is inferior to 80 km/h.

When it is not given the value of the base speed, it should be used in its place the maximum general limit of legal speed of the road in consideration;

i) "Road to be contractually" the road to build whose execution project is approved after the entrance in application of the present diploma;

j) "Flanked road by cliffs or accentuated slopes" the road in which the unevenness between the platform of the road and the land of adjacent level is same or superior to 3 m and the inclination of the slope is superior to two thirds.

### 3<sup>rd</sup> Article

#### Devices of continuous protection

The continuous metallic device type of protection should be constituted by a metallic beam, of profile plane or identical to the profile of the guard's beam, it fastens to the face previous or subsequent of the shock absorber of the superior beam through a device of removal, or for tubes of polyethylene or other material of similar characteristics coupled through appropriate devices to the plumb lines of safety's guards in reference.

### 4<sup>th</sup> Article

#### Devices of similar protection

1 - In case of difficulties verified in the acquisition of the devices referred in the previous article, the protection devices to be used can be of the shock-absorbing type of impact, of individual placement in each post of the road restraint system.

2 - The devices foreseen in the previous number can be manufactured in expanded polystyrene, reticulated polyethylene, polypropylene, polyurethane or other similar material, since respecting the established in the 5<sup>th</sup> article of the present diploma.

### 5<sup>th</sup> Article

#### Conception and construction of the protection devices

1 - The acceptance of the protection devices to be putted in roads, in the terms of the present diploma, depends on the presentation on the following relative documents to the device type:

- a) Certification that the system formed by the road restraint system and the protection device accomplishes the standard requirements of EN 1317 for its class, as attested by notified body (believed entity), in the European Union, for the effect;
  - b) Certification that the protection device accomplishes the constant requirements of the enclosure IV, published enclosed to the present diploma and that of him is integral part, as attested by the National Laboratory of Civil Engineering (LNEC) or laboratory believed for the effect;
  - c) Declaration of the manufacturer's conformity, certifying of the production control of the components of the protection device, and with indication of the durability of the device, that is, of the period in that the same maintains their performance and physical characteristics;
  - d) Technical recommendations of assembly and maintenance of the protection device in the road.
- 2 - The protections to apply in road restraint systems can be become designed, built and installed in several way of the suitable in the articles 3<sup>rd</sup> and 4<sup>th</sup> of the present diploma, since they respect the determination in the previous number.

#### 6<sup>th</sup> Article

##### Identification of the black spots

- 1 - The Vial General-Direction (DGV) will provide to the legal collective people or contractually responsible for the operation maintenance of the public roads permanent access to the data-base of road accidents that it generates, allowing collects and treatment of all the information considered necessary for the referred entities for the identification of the black spots in the roads under the respective jurisdiction, with exclusion of the access the relative personal data to the victims of accidents, in the terms of the law.
- 2 - The data-base of road accidents is upgraded by DGV in the 31<sup>st</sup> January every year with the information of the previous calendar year, being the respective information made available, until that same date, to the legal collective people or contractually responsible for the operation maintenance of the public roads.
- 3 - The legal collective people or contractually responsible for the construction or operation maintenance of the public roads send, every year, up to 31<sup>st</sup> of March, to DGV and to the Portuguese Road Prevention, the list of the identified black spots relative to the previous calendar year.
- 4 - DGV and the Portuguese Road Prevention emit the agreement on the black spots referred in the previous number and they publish the respective list until 30<sup>th</sup> April every year.

#### 7<sup>th</sup> Article

##### Remaining situations

- 1 - Besides the black spots, identified in the terms of the previous number, the protection devices must be installed in the road restraint systems of the roads in the cases that the existence of fixed and rigid obstacles less than 2 m of the limit of the wheelwork strip is revealed of provoking superior damages to the caused by the collision in the same ones, namely encounters of bridges, pillars, walls, posts and trees of great load.
- 2 - Protection devices are located, also, in freeways and highways, main itineraries, complementary circular and variant itineraries, whenever it is considered necessary, and, especially, in the spots referred in the lines i) to viii) of the paragraph a) of n° 2 of the 3<sup>th</sup> article of the Law n° 33/2004.
- 3 - In national, regional and municipal roads, the protection devices are located in the spots referred in the lines i) to viii) of the paragraph a) of n° 2 of the 3<sup>th</sup> article of the Law n° 33/2004 and also when the road is flanked of cliffs and accentuated slopes.
- 4 - In curved alignment, the protection devices can just be putted in the existent guards in the outside.
- 5 - In the terms of the previous number, the protection devices must begin in the middle of the transition curve that precedes the circular curve or 50 m before the beginning of the circular curve, in case it doesn't exist her referred transition curve, and growing until, at least, 50 m after the medium point of the transition curve that is followed by the circular curve or, in case that doesn't exist curves

of transition, until at least 50 m after the end of the circular curve, if in those extensions adjacent to the curved alignment there still exists road restraint systems.

8<sup>th</sup> Article  
Entrance in application

The present diploma goes into effect 30 days after the date of its publication.

Seen and approved in Council of Ministers of January 20, 2005. - Pedro Miguel de Santana Lopes - António José de Castro Bagão Félix - Daniel Viegas Sanches - António Luís Guerra Nunes Moxia.

Promulgated in 24 of Março of 2005.

Be published.

The President, JORGE SAMPAIO.

Countersigned in 31 of Março of 2005.

The Prime minister, José Sócrates Carvalho Pinto of Sousa.

ENCLOSURE I

[table that is referred in the paragraph d) of the 2<sup>nd</sup> article]

Minimum normal ray (in plant)

Base speed (km/h)	Minimum normal ray (m)
40	110
50	180
60	250
70	350
80	450
90	550
100	700
110	850
120	1000
130	1200
140	1400

ENCLOSURE II

[Table that is referred in the paragraph e) of the 2<sup>nd</sup> article]

Superelevation in curve

Two way roads		Two by two ways roads	
Ray (m)	Over elevation (%)	Ray (m)	Over elevation (%)
≤ 450	7	≤ 900	7
525	6,5	1100	6,5
600	6	1300	6
700	5,5	1500	5,5
850	5	1750	5
1000	4,5	2000	4,5
1200	4	2250	4
1400	3,5	2600	3,5
1600	3	3000	3
1900≤R<2500	2,5	3500≤R<5000	2,5
≥ 2500	-	≥5000	-

### ENCLOSURE III

#### Measurement of the coefficient of traverse attrition through equipment type SCRIM

For effects of the present diploma, the measurement of the traverse attrition of the surface of a pavement is made with an equipment of the type SCRIM (sideway forces coefficient routine investigation machine).

The measurement is made on the wet pavement with a cast of water controlled, which provides a film of water of 0,50 mm of thickness in the contact area with the measure wheel, in continuous, along the external wheel of each one of the roads of traffic built and to the speed of 50 km/h. The measure wheel makes an angle of 20° with the direction of the displacement and it is equipped with a normalized tire (dimensions: 76 mm x 508 mm; pressure: 350 KPa; resiliency: 46% (more or less) 3% at 20°).

The acquisition system and treatment of data determines, for each interval of 20 m, during eight intervals of same time, the values of the coefficient of traverse attrition, the real speed and the average of these values. These data is recorded in magnetic support and treated later.

The resource is admitted the other equipment types, if they made the measurement of the coefficient of traverse attrition through oblique(s) wheel(s), be equipped with an automatic watering system that it guarantees a film of uniform water on the measurement surface and present proven correlations among the results obtained with the used equipment and the ones that would be obtained with SCRIM. Although the reference conditions are the supra-presented, namely at a speed of 50 km/h, a film of water with 0,50 mm of thickness and a step of 20 m, different conditions can be used, according to the used equipment and the conditions in that the measurement is made, should be respected the manufacturer's indications.

### ENCLOSURE IV

Test of a protection device for motorcyclists applied into a guard of a road restraint system.

For effects of the paragraph b) of n. 1 of the 5<sup>th</sup> article of the present diploma, a device for motorcyclists' protection can only be authorized if it goes subject to the test with the characteristics to proceed described and the respective results satisfy the respective acceptance criterion.

A test of a protection device for motorcyclists applied into a guard of a road restraint system:

1 – A dummy of 80,5 kg (more or less) 0,5 kg is launched to the protection device for motorcyclists installed in the inferior part of the road restraint system to the speed of 60 km/h (more or less) 6%, with a theoretical angle of incidence of 30° (more or less) 2° and in two different positions:

- a) Lying back with the head in front and the longitudinal axis of the coincident body with the established direction for the trajectory (in other words, in the impact the dummy's axis will make an angle of 30° (more or less) 2° with the guard of safety of the device);
- b) Lying back with the parallel body to the system (in other words, in the impact the dummy's longitudinal axis will make a 0° angle (more or less) 2° with the device).

The system should have, in the minimum, 16 m of extension and moved away with posts of 2 m in 2 m.

2 - A protection device for motorcyclists tested in the conditions presented in the previous number is accepted if the value of the index HIC (head injury criteria) goes smaller or equal to 1000 ( $HIC \leq 1000$ ). This index is obtained from the measured accelerations in the centre of gravity of the dummy's head.

By the test upper described it will be made a document, containing the indication of the entity that requested it, the date of accomplishment, the designation and the description of the tested system and of the elements and materials that constitute it, the technical specifications and of assembly of that system, its operation way, the indication and the description of the test and the respective acceptance criterion, as well as the reached results. They will be still presented all the written pieces and draws necessary to the good understanding of the aspects previously mentioned, as well as pictures and other elements that are considered convenient for such end.