Creating “forgiving” roadsides
by using passive safe road equipment,
CE marked for EN12767

Explanation on EN12767

Carolien Willems
Member WG10, TC226 of EN12767
Developer of the ZIPpole
Director and co owner Safety Product


Andere
richtingen

Road equipment

- to improve traffic safety and social safety

- close to the road to be “seen”
  - can they be an obstacle in an accident ?
  - how to design safe roadsides?
  - how to handle obstacles close to the road?
    - why taking care of obstacles close to the road?






Creating “forgiving” roadsides by using passive safe road equipment (EN12767)

- Explanation on the standard
- When using passive safe poles?
- What type of safe poles?
- Choosing the right product

In road design, allowances need to be made that can help compensate for human error, and roads and roadsides are built in such a way that their physical characteristics minimize potential harmful consequences to all.

World Health Organization

DECADE OF ACTION FOR ROAD SAFETY 2011-2020

VISION ZERO INITIATIVE
TRAFFIC SAFETY BY SWEDEN

Vision zero: "in every situation, a person might fail, the roadsystem should not"

How to design safe roadsides?

This philosophy of a "forgiving road" is the mere recognition that road users sometimes leave the running carriageway for explainable or unexplainable reasons.

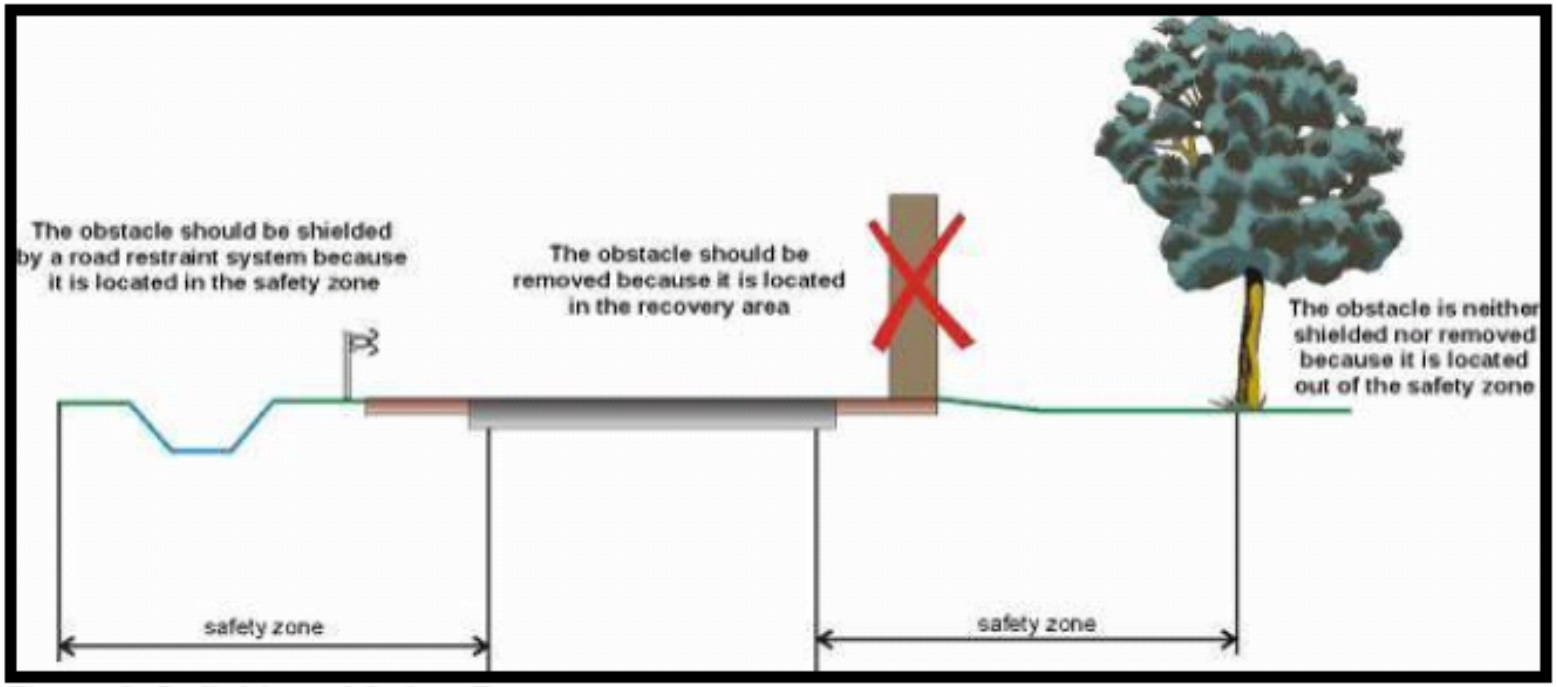

Figure 3. Definition of Safety Zone

EN 12767, passive safety for road infrastructure = product standard to qualify products

The severities of accidents for vehicle occupants are affected by the performance of support structures for items of road equipment under impact. Based on safety considerations, these can be made in such a way that they detach or yield under vehicle impact.

This European Standard provides a common basis for testing of vehicle impacts with items of road equipment support.

This European standard considers three categories of passive safety support structures:

— high energy absorbing (HE);

— low energy absorbing (LE);

— non-energy absorbing (NE).

Energy absorbing support structures slow the vehicle considerably and thus the risk of secondary accidents with structures, trees, pedestrians and other road users can be reduced.

Non-energy absorbing support structures permit the vehicle to continue after the impact with a limited reduction in speed. Non-energy absorbing support structures may provide a lower primary injury risk than energy absorbing support structures.

EN 12767, passive safety of road infrastructure

NE

The pole breaks or comes out of the ground. The speed of the car is not really reduced so no energy is absorbed. There might be the risk of having a second accident.

LE

The pole bends slightly and then breaks or comes out of the ground, there is some energy absorbed so the speed is slightly reduced.

HE

The speed of the car is slowed down, the energy of the impact is highly absorbed.

EN 12767, passive safety for road infrastructure

Table 1 — Impact speeds

Speed class km/h	Impact speeds km/h
50	35 and 50
70	35 and 70
100	35 and 100

Table 2 — Energy absorption categories

Impact speed, v_I km/h	50	70	100
Energy absorption category	Exit speed, v_e km/h		
HE	$v_e = 0$	$0 \leq v_e \leq 5$	$0 \leq v_e \leq 50$
LE	$0 < v_e \leq 5$	$5 < v_e \leq 30$	$50 < v_e \leq 70$
NE	$5 < v_e \leq 50$	$30 < v_e \leq 70$	$70 < v_e \leq 100$

E (J)= m/2 * v² :

$(50^2 - 0^2) < (70^2-5^2) < (100^2-50^2)$

2500 < 4875 < 7500

EN 12767, passive safety for road infrastructure

Table 5 — Occupant safety

Energy absorption categories	Occupant safety level	Speeds			
		Mandatory low speed impact test 35 km/h		Speed class impact tests 50 km/h, 70 km/h and 100 km/h	
		Maximum values		Maximum values	
		ASI	THIV km/h	ASI	THIV km/h
HE	1	1,0	27	1,4	44
HE	2	1,0	27	1,2	33
HE	3	1,0	27	1,0	27
LE	1	1,0	27	1,4	44
LE	2	1,0	27	1,2	33
LE	3	1,0	27	1,0	27
NE	1	1,0	27	1,2	33
NE	2	1,0	27	1,0	27
NE	3	0,6	11	0,6	11
NE	4	No requirement	No requirement	See 5.6	

When using passive safe poles?

Finland: on roads where speed is ≥ 60km/h and 1000 vehicles/day

Belgium: roads where speed is ≥ 50 km/h, within the safety zone, without guardrails

Holland: NE poles if clear zone of 40m by 50m
HE if there is no clear zone of 40m by 50m

…

What type of safe poles?

HE: in case of other obstacles and other roadusers and no guardrails

NE: in case of a clear, flat zone, no other obstacles and no other roadusers

Choosing the right product:

Risk of installation
The installation guidelines of the manufacturer should be followed to guarantuee the right functioning of the product.

Size of the safety zone
If the product has a specific zone to hit in a car crash, the installation should be done accordingly.

Multidirectional
If the product can be hit from different directions, the product should be safe in all directions.

Risk for secondary accidents
If there are other obstacles, it is best to slow down the colliding vehicle.

Future

1 Challenge designers to remove obstacles from the safety zone

2 If not possible to remove them, make them forgiving

Create “forgiving” roadsides by demanding for the highest safety level for road infrastructure:

prescription of products being CE marked according EN12767, 100HE3 and 100NE3

Offices:
Boudewijnlaan 5
2243 Pulle
Belgium

Offices and production:
Industrie E17/ 3, N°3320
9160 Lokeren
Belgium

Crash site:
Hoogbuul
2250 Olen
Belgium

www.zippole.com
www.safety-product.eu

Carolien Willems
Carolien.willems@safety-product.eu
Member TC226, WG10 for EN12767
Tel: +32 473 71 20 24

SAFETY-PRODUCT

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