DTZS 702

DRAFT TANZANIA STANDARD

Specification for Road Humps and Rumble Strips

TANZANIA BUREAU OF STANDARDS

2nd Edition.

0 National foreword

The Tanzania Bureau of Standards is the statutory national standards body for Tanzania, established under the act.No.3 of 1975, amended by act.No.2 of 2009.

This draft Tanzania Standard is being prepared by BCDC 5 Roads Technical Committee under the supervision of the Building and Construction Divisional Standards committee (BCDC).

In the preparation of this Tanzania Standard, reference was made to ***KS 774: 2000, Specification for road bumps, published by Kenya Bureau of Standards and A guide to Traffic Signing, published by Ministry of Infrastructure Development, Safety and Environment Unit of the United Republic of Tanzania, 2009.***

This second edition cancels and replaces the first edition which is technically revised.

1 Scope

This Tanzania Standard specifies the requirements for design and construction of road humps and rumble strips, intended for use in speed control on roadways.

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2 Definitions

For the purposes of this Tanzania Standard, the following definitions shall apply:

2.1 Road hump/ bump

a device for controlling speed of vehicles, consisting of a raised area extending transversely across the roadway.

2.2 Circular road hump

a circular profile with a short run-on fillet at both ends to smoothen the passage of vehicles.

2.3 Flat-topped hump

alternative to the circular road humps but are longer and with a flattened top, used to give pedestrians a level crossing between footways.

2.4 Rumble strips

transverse strips across the road used to alert and warn drivers with a vibratory and audible effect before a hazard ahead such as a sharp bend, an intersection or a big change in the speed limit

2.5 Hazard distance

a stopping distance to the hazard area.

2.6 Pedestrian crossing

a designated point on a road at which some means are employed to assist pedestrians wishing to cross

3 Applications

3.1 Road Humps

These are constructed on roads with the following objectives:

a) To reduce speeds of vehicles on roadways with speed limits of 50 km/h or less, for areas with many pedestrians along the roads.
b) To reduce speeds of motor traffic at junction approaches in order to enhance the priority order of the junction.

3.2 Road bumps

These are constructed on private roadways and parking lots.

3.3 Rumble Strips

These are introduced as raised warning patterns to motorists on potential danger on the road.
Such danger includes;

a). Humps or pedestrian crossings, in both driving directions;
b). At approaches to dangerous junctions;
c). Sharp bends or at railway crossings.

4 Materials

Road humps and rumble strips shall be constructed from suitable materials such as asphalt concrete, cement concrete, and other suitable materials approved by relevant authority.

5 Design considerations

5.1 Road humps

5.1.1 Circular humps

For circular humps the following radius and chord length for different speed levels should be applied. The recommended radii and chord lengths for circular humps are on table 1 whereas figures 1 to 3 show heights and chord lengths for 50km/hr, 40km/hr and 30km/hr speed levels respectively.

Table 1-Recommended radii and chord lengths for circular humps.

Car (truck) speed level (km/hr)	Radius (m)	Chord length (m)
30(15)	20	4.0
35(20)	31	5.0
40(25)	53	6.5
45(30)	80	8.0
50(35)	113	9.5
(40)	180	12.0

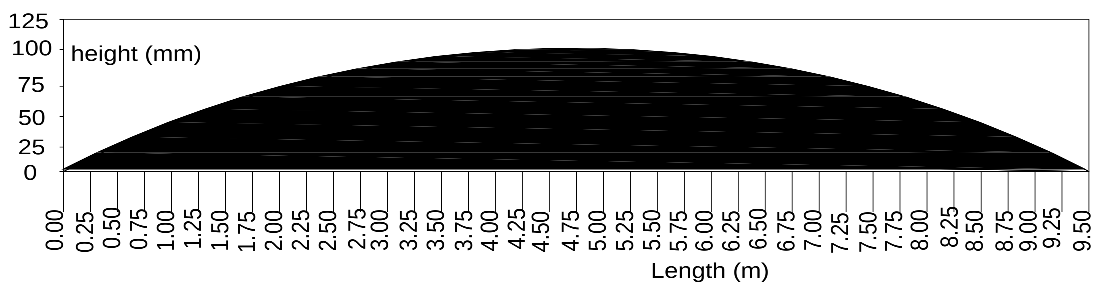


Figure 1-Cross section for circular hump designed for 50 km/h.

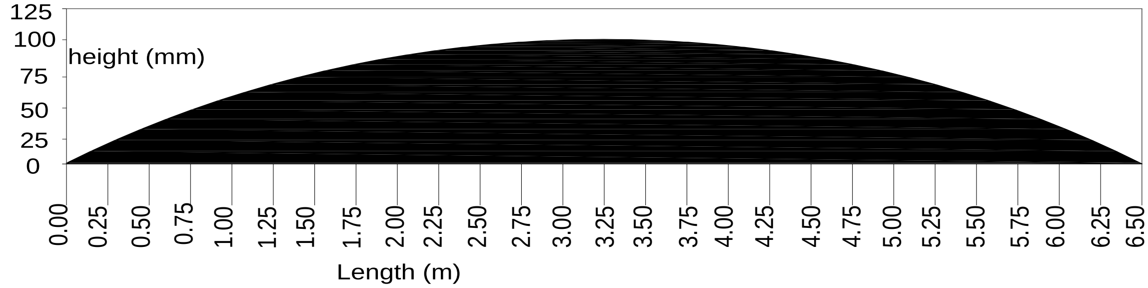


Figure 2-Cross section for circular hump designed for 40 km/h.

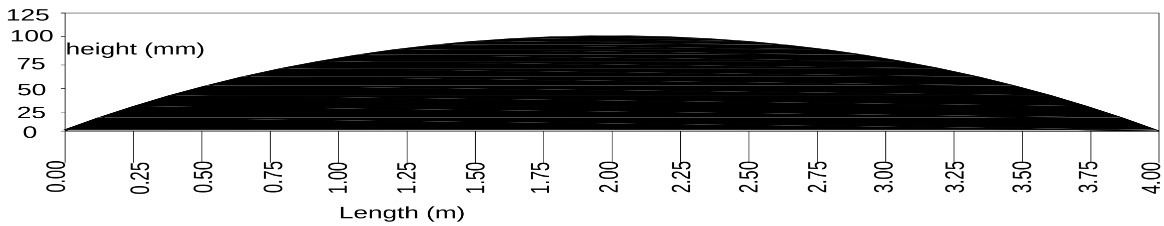


Figure 3-Cross section for circular hump designed for 30 km/h.

5.1.2 Crown Height

The recommended crown height for circular humps is 75 to 100 mm for all humps as shown in figure 4. Heights above 100 mm may cause damage to vehicles.

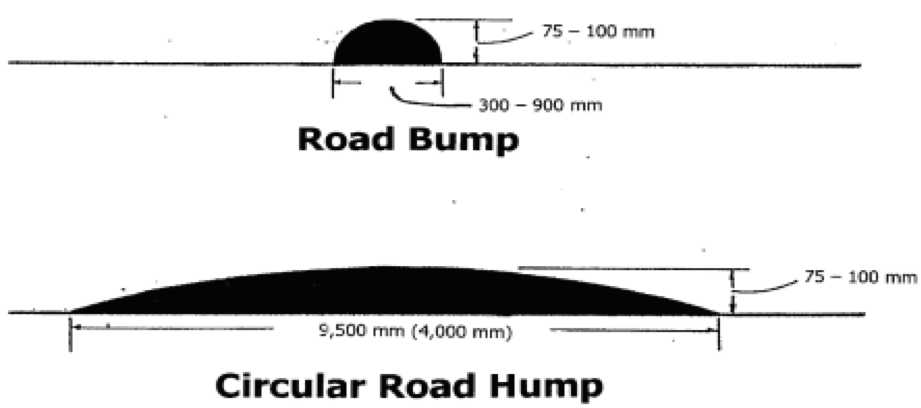


Figure 4- Difference between a Road Bump and a Circular Road Hump

5.1.3 Flat-Topped Road Humps

Flat-topped road humps are an alternative to the circular road humps but are longer and with a flattened top, used to give pedestrians a level crossing between footways. They can be useful where there are a lot of pedestrians.

Normally, pedestrian (zebra) crossings should only be installed at busy crossing points. Where it is necessary to use traffic calming measures to reduce speed, the most suitable arrangement is to install circular road humps a short distance from the pedestrian crossing. If it is necessary to provide a hump at the crossing, a flat-topped hump should be used, which is easier for pedestrians. It should however be noted that flat-topped humps cause more discomfort to bus passengers, so they should not be installed on busy bus routes.

The standard size in Tanzania is normally 8.4 m long and 100 mm high as shown in Figure 5. However, other sizes may be adopted depending on site conditions as indicated on Table 2.

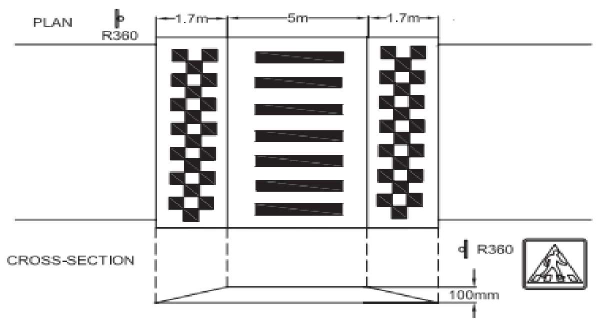
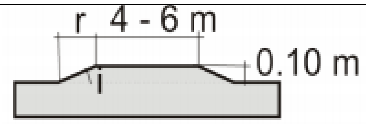


Figure 5- Standard Flat-topped Road Hump

Table 2 – Design of flat-topped roads humps



Car (truck) speed level	Ramp length r (m)	Grade i (%)
30 (10)	1.0	10
35 (15)	1.3	7.5
40(20)	1.7	6
45(30)	2.0	5
50(30)	2.5	4
(35)	3.3	3
(40)	4.0	2.5

5.1.4 Hazard distance

The closest hump to the hazard area shall be placed at a distance depending on the projected speed over the section and this shall be equal to the required spacing of humps as shown in table 3.

Table 3-Recommended relationship between desired speed and spacing of humps

Desired speed (km/h)	Distance between humps (m)
50	250
40	100
30	75

5.2 Rumble strips

5.2.1 Dimensions

The height of an individual strip shall be between 12 mm and 15 mm, the breadth shall be 200 ± 10 mm, the space between individual strips shall be 200 mm (see Figure 6). The length of the strip shall be equal to the width of road.

Figure 6- Rumble strips detail

5.2.2 Strips spacing and arrangement

Rumble strips shall be constructed in sets of 4 strips as shown in figure 6. These strip sets shall be classified into types A, B and C with individual strip spacing of 4, 3 and 2 meters respectively in correspondence with the projected reduction of traffic speed at the relevant road stretch as shown in table 3.

Table 4 – Classification and arrangement of rumble strips

Approach speed of traffic, kph	Type of strips set	Spacing of strips, Centre to Centre, m	Distance to strip set of next (lower) speed bracket, Centre to Centre, m
Over 100	A	4.0	100
50-100	B	3.0	40
Less than 50	C	2.0	N/A

6 Warning signs

6.1. Wherever road humps are constructed, warning signs of the design shown in Figure 7 shall be installed. Signs are designed to be read from a specific distance, so the sign must be sited where it can be clearly seen from the distance requirements as shown in Table 5.

Table 5 – Visibility Distance Requirements

Approach speed (km/hr)	≤ 60	80	≥ 100
Visibility distance to the sign, m	60	80	100-150

6.2. Where rumble strips are included as emphasis to a warning sign before humps or other impending hazard, the first strip set shall be positioned at not more than 50 m from the warning sign in the

6.3. direction of approach to the hazard. In case of multiple sets of rumble strips, the second set shall coincide with the warning sign to the hazard.

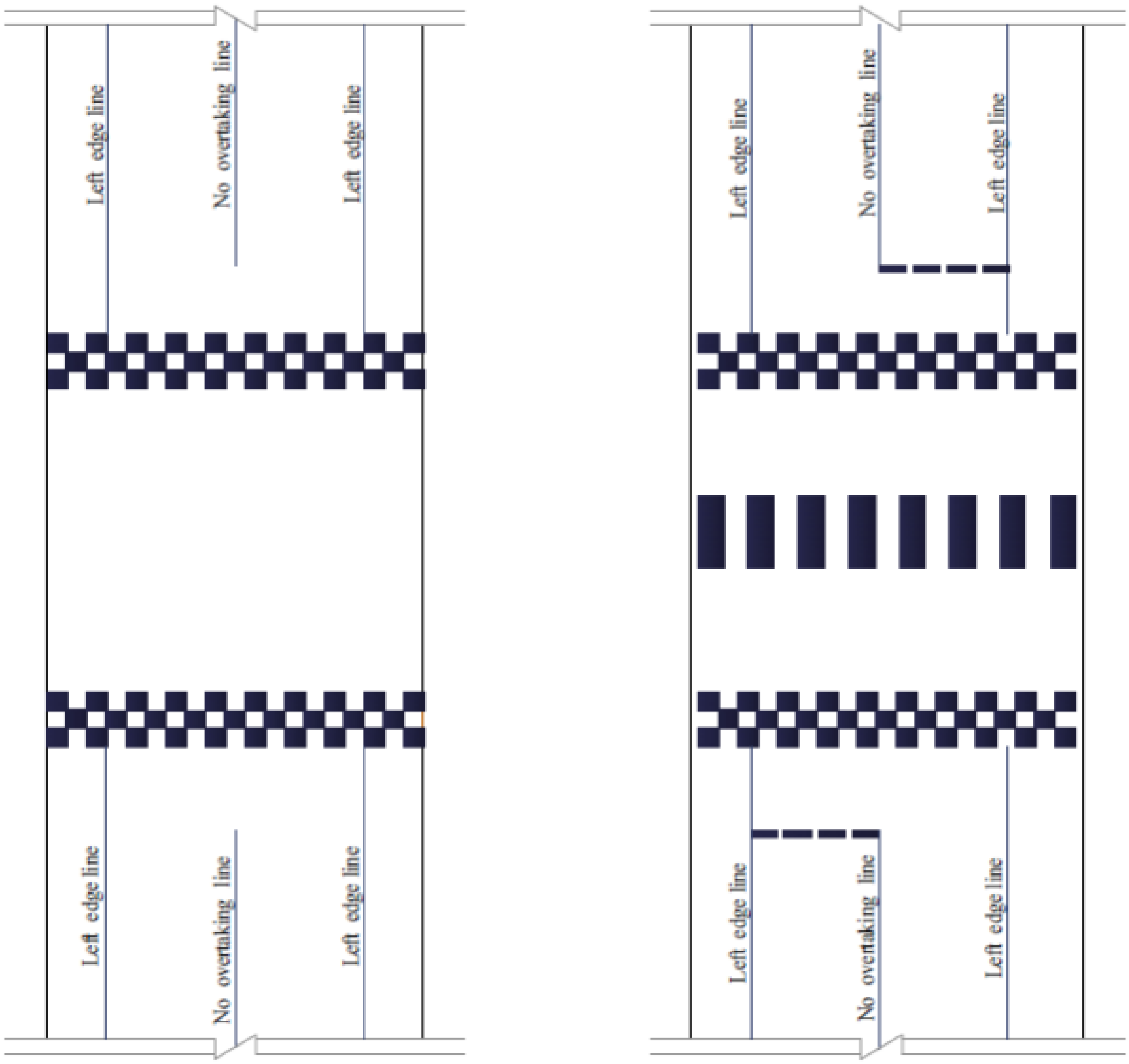
Figure 7- Warning sign.

7 Painting and marking

7.1 Road humps shall be draft-painted with thermoplastic reflective white paint or any suitable materials (see Figure 8) approved by the relevant authority on the ramp of the hump in the direction of traffic.

7.2 In the absence of the paint in clause 8.1, road humps shall be marked by placing retroreflective road delineators along the edges in both directions at a spacing of 750 mm. The delineators may also be placed in addition to the paint.

7.3 At both ends of a hump, a 1500 mm high white pole fitted with white and red reflectors on both directions (see Figure 9) shall be erected to further enhance the positioning of the hump to road users.



(a) (b)

Figure 8- Marking on ramps of road humps with and without pedestrian crossing

(a) Without pedestrian crossings.
(b) With pedestrian crossings.

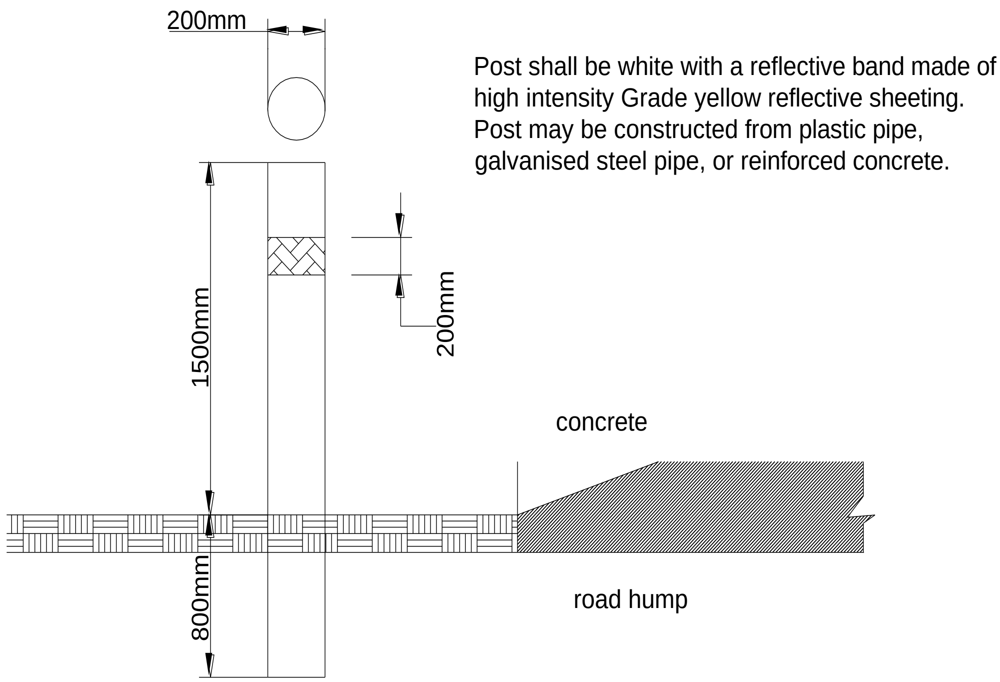


Figure 9- Road Hump Marker Post

8 Maintenance

8.1 Regular inspection shall be conducted to ensure that the road humps and strips do not distort excessively in shape and size in the course of usage. They shall be reconstructed whenever any of the dimensions given in table 1 and clause 5.2.1 are in difference of more than 25 percent.

8.2 Painting and marking of existing road humps shall be restored or cleaned as regularly as necessary in order to maintain their visibility to road users.

9 Caution

9.1 When constructing speed humps and rumble strips, absolute care shall be taken to ensure that other road facilities or furniture such as drainage, walking pavements, street lighting, etc. are not interfered with.

9.2 Road humps constructed in high-risk areas shall not excessively slow down motor traffic to the level of compromising security and safety

Bibliography

1 Road Geometric Design Manual – 2011. The United Republic of Tanzania, Ministry of Works.

2 Traffic calming measures - Design Guideline, Version 1 / July 2007. Ghana highway authority road safety and environment division.

3 A Guide to Traffic Signing (2009). United Republic of Tanzania, Ministry of Infrastructure Development.