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DRAFT EAST AFRICAN STANDARD

Speed humps and rumble strips — Specification

EAST AFRICAN COMMUNITY

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Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in the East African Community. It is envisaged that through harmonized standardization, trade barriers that are encountered when goods and services are exchanged within the Community will be removed.

The Community has established an East African Standards Committee (EASC) mandated to develop and issue East African Standards (EAS). The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the public and private sector organizations in the community.

East African Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the Principles and procedures for development of East African Standards. XXXXXX.

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

The committee responsible for this document is Technical Committee EASC/TC 028, *[Construction of roads, rails, air and water transport infrastructure]*.

Attention is drawn to the possibility that some of the elements of this document may be subject of patent rights. EAC shall not be held responsible for identifying any or all such patent rights.

Speed humps and rumble strips — Specification

1 Scope

This Draft East Africa Standard specifies the requirements for designing, choosing sites, constructing, marking, and maintaining speed humps and rumble strips, used to control speed on asphalt or concrete roads.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

WDEAS xxx:2025 Roads marking and traffic signage - Code of practice

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

3.2 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

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

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

3.5 flat-topped hump
alternative to the circular speed humps but are longer and with a flattened top, used to give pedestrians a level crossing between footways.

3.7 hazard distance

distance between the traffic calming device and the hazard

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

4. Application

4.1 Speed humps

Speed humps are constructed on roads and highways with the following aims:

a) To regulate speeds in road sections (e.g. in town centres and trading centres), when speeding through traffic presents an accident risk

b) To reduce speeds of vehicles on roadways with speed limits of 50 km/h or less, for areas with many pedestrians along the roads.

c) To reduce speeds of motor traffic at junction approaches in order to enhance the priority order of the junction.

4.2 Rumble Strips

Rumble strips are introduced as a warning mechanism in dangerous road sections or where special driving attention is required, such as:

a) before speed humps or pedestrian crossings, in both driving directions;

b) at approaches to hazardous junctions;

c) to give emphasis to warning signs, e.g. before sharp bends or at railway crossings. or at areas with documented crash history related to fatigue or inattention.

NOTE Rumble strips are warning devices intended to enhance driver alertness and should not be used as a substitute for speed control measures or geometric design improvements

5. Materials

Speed humps and rumble strips shall be constructed from suitable materials such as asphalt concrete, cement concrete, and other suitable materials complying with the applicable standards and approved by relevant authority.

6. Road speed humps

6.1 Design Considerations

6.1.1 Circular humps

6.1.1.1 Dimension and spacing

6.1.1.1.1 Dimensions — In relation to the desired speeds at designated road sections, the heights and breadths of the humps shall be as given in Table 1. The lengths shall be the width of the road including shoulders, as shown in Figure 1.

6.1.1.1.2 Spacing — Where there is a need to maintain reduced traffic speed over a long section of the road, several humps shall be introduced at spacings relative to the designated speed as shown in Table 1.

6.1.1.1.3 The use of circular humps in urban areas is discouraged. To avoid excessive discomfort, vehicle underbody contact, and damage, the flat-topped humps are recommended to be used where public transport, pedestrians, and low-clearance vehicles are common.

Table 1 – Geometrical details of circular speed humps

Desired speed Km/h	Bus speed during passage Km/h	Radius m	Chord length m
20	5	11	3.0
25	10	15	3.5
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

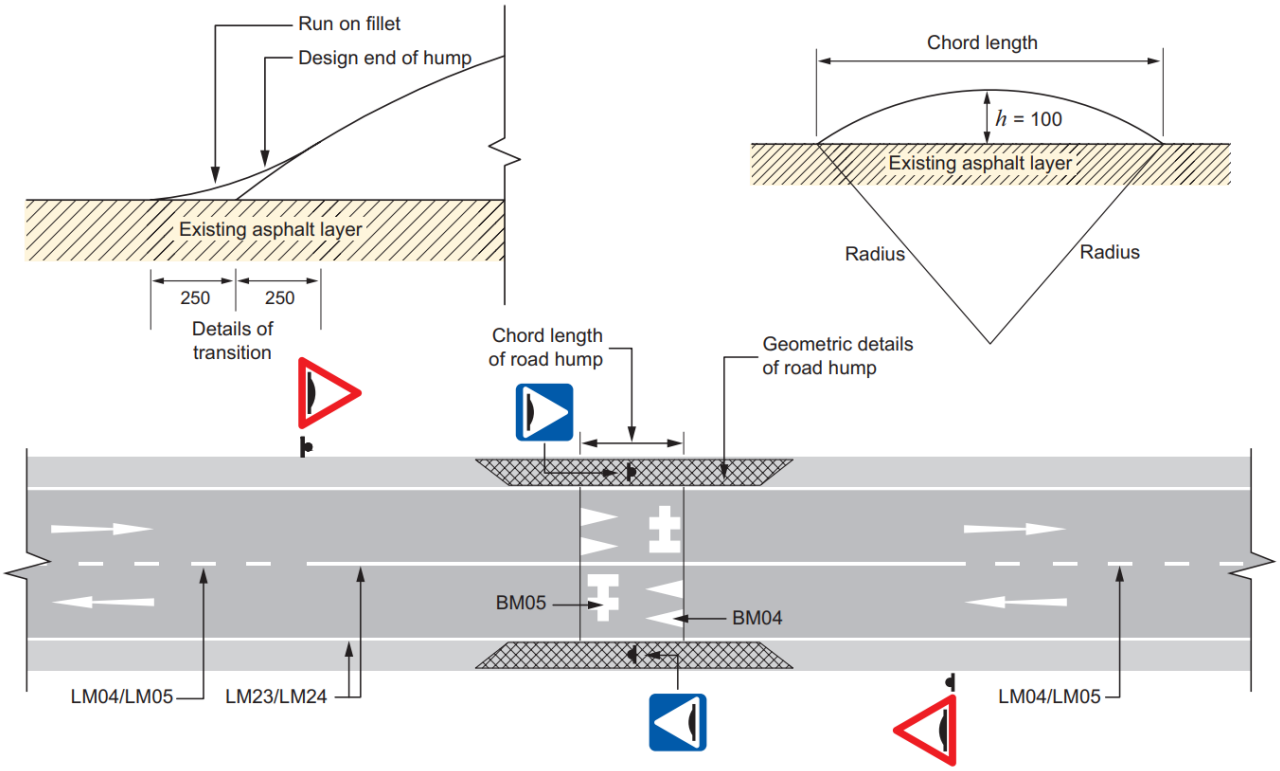

Figure 1 – Speed humps profile

6.1.1.2 Radius and chord length

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.

6.1.2 Flat-Topped speed Humps

Flat-topped speed humps are an alternative to the circular speed 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 speed 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 recommended size is normally 8.4 m long and 100 mm high as shown in Figure 2. However, other sizes may be adopted depending on site conditions as indicated on Table 2.

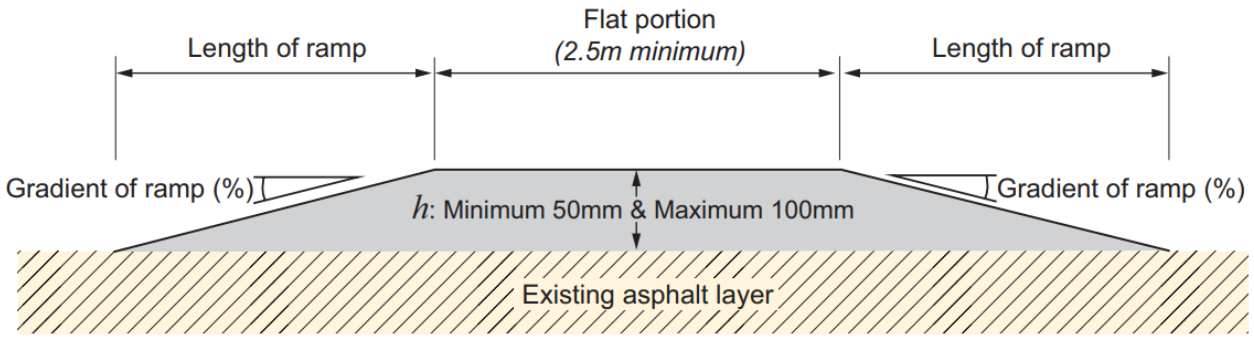

Figure 2 – Recommended Flat-topped speed hump

Table 2 – Design of flat-topped roads humps

Desired speed Km/h	Bus speed during passage Km/h	Length of Ramp m	Gradient m
20	Near zero	0.7	14.0

25	5	0.8	12.5
30	10	1.0	10.0
35	15	1.3	7.5
40	20	1.7	6.0
45	25	2.0	5.0
50	30	2.5	4.0

6.1.4 Siting distance of speed humps

The closest hump to the hazard area should be placed at a distance depending on the projected speed over the section and this should 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

6.2 Construction

6.2.1 The construction of speed humps using asphalt concrete may be effected in the manner as illustrated in the following example (see summary in Figure 3):

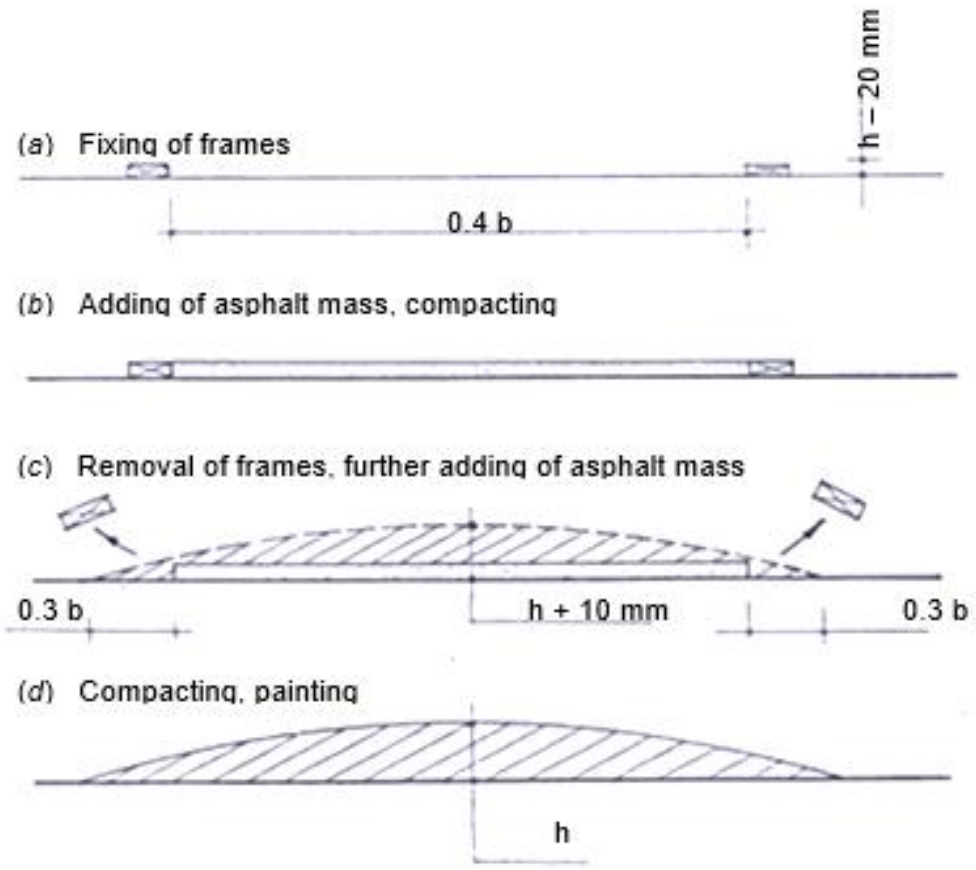

Figure 3 – Sequence of construction of humps

6.2.2 After identifying the positioning of the humps, the core, measuring 0.4 times the required breadth 'b' of the hump, shall be demarcated by use of timber frames. Care shall be taken to ensure that the road surface is reasonably level. The frames' height shall be 2 mm less than the required hump height 'h'.

6.2.3 Asphalt mass, as specified in 5, shall be added between the frames and tamped until level, after which the frames shall be removed.

6.2.4 With the core as a guide, the rest of the hump shall be formed by adding more asphalt to form a surface of even curvature, which with a hand tamper shall give a hump height of approximately h mm + 10 mm.

6.2.5 The asphalt, while still wet, shall then be mechanically compacted to achieve the required height.

6.2.6 After the asphalt has set, the hump shall be painted as described in 9.

6.2.7 On heavy traffic roads sections, the construction of speed humps should consider the materials at approaches that reduce road deformation failures.

6.2.8 Where the pedestrian walkway and speed hump are on different levels, a small ramp shall be provided to allow the universal access.

6.4 Minimum Number of Humps

The number of humps at approaches to hazardous areas shall be not less than two.

7. Rumble strips

7.1 Design Considerations

7.1.1 Dimensions

The height of an individual strip shall be not less than 5 mm and not more than 20 mm, the breadth shall be 150mm to 500mm and the spacing between strips shall be 400mm to 1000 mm, as shown in Figure 4. The length of the strip shall be the width of road including shoulders.

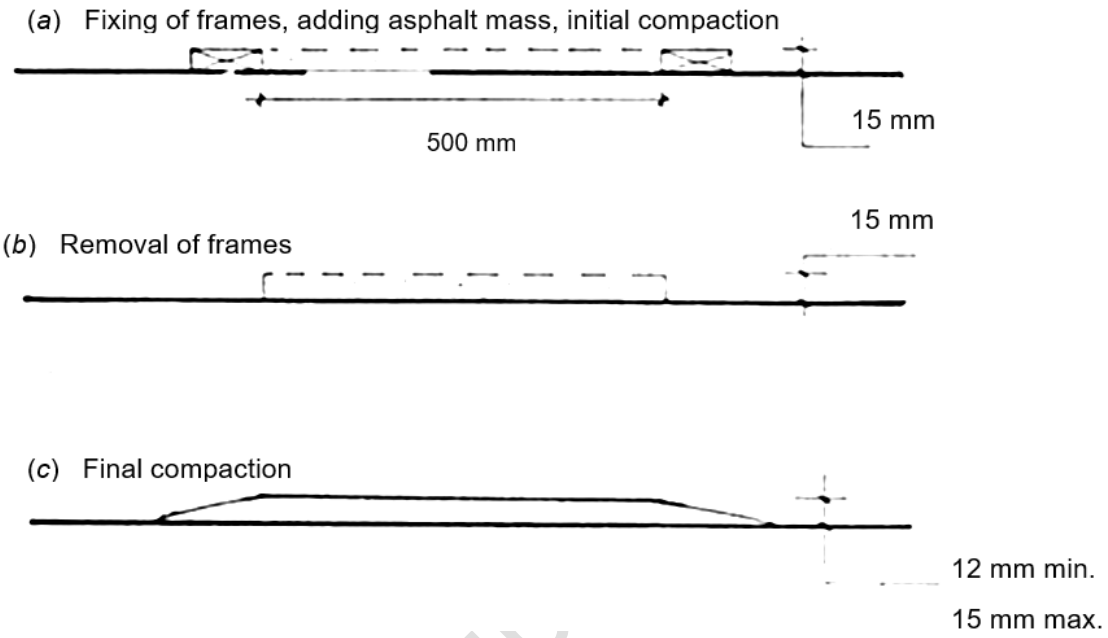

Figure 4 – Construction of strips

7.1.2 Strip Spacing and Arrangement

7.1.2.1 Rumble strips shall be constructed in sets of 4 strips as shown in Table 5. These strip sets shall be classified into types A, B and C with individual strip spacings of 4, 3 and 2 metres respectively in correspondence with the projected reduction of traffic speed at the relevant stretch.

7.1.2.2 As shown in Table 5, strip sets shall be placed at varying distances from each other, depending on the projected speed brackets.

Table 5 – Classification and arrangement of rumble strips

Projected initial speed of traffic, kph	Projected end speed of traffic, kph	Required type of strip set	Spacing of strips, centre to centre, m	Distance to strip set of next (lower) speed bracket, centre to centre, m
Over 100	75-100	A	4.0	100
75-100	50-75	B	3.0	40

50-75	25-50	B	3.0	40
Less than 50	Less than 25	C	2.0	N/A

7.2 Construction

The procedure for erecting the strips shall be as follows (see summary in Figure 5):

7.2.1 The positioning of the rumble strips shall be identified in accordance with 7.1. After ensuring that the road surface is reasonably level, the individual strips shall be demarcated by the use of timber frames of 15 mm height. The inner edges of the frames shall be 500 mm distant from each other.

7.2.2 Asphalt mass as per 4 shall be added between the frames and hand-compacted until level, after which the frames shall be removed.

7.2.3 Using a mechanical compactor, the asphalt will further be compacted to achieve the required height of the strip. The same shall be used to round off the edges of the strip.

8. Warning sign

8.1 Wherever road humps are constructed, warning signs shall be installed as per Figure 5. Such signs shall have high intensity reflective properties in accordance with the requirements of EAS 999 and shall be placed as per the

8.2 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 metres from the warning sign in the 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.

8.3 Rumble strips do not need signs to warn about them. However, they shall be used in conjunction with appropriate sign relating to the actual hazard ahead.

Figure 5- Warning sign.

9. Painting and marking

9.1 Road speed humps shall be stripe-painted with thermoplastic reflective white or yellow paint diagonally to the alignment of the road. Saw-tooth arrangement of the painting at 30° to the direction of the road and with the pointed teeth at the edges of the hump, shall also be acceptable.

9.2 In the absence of the paint in clause 9.1, speed 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.

9.3 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.

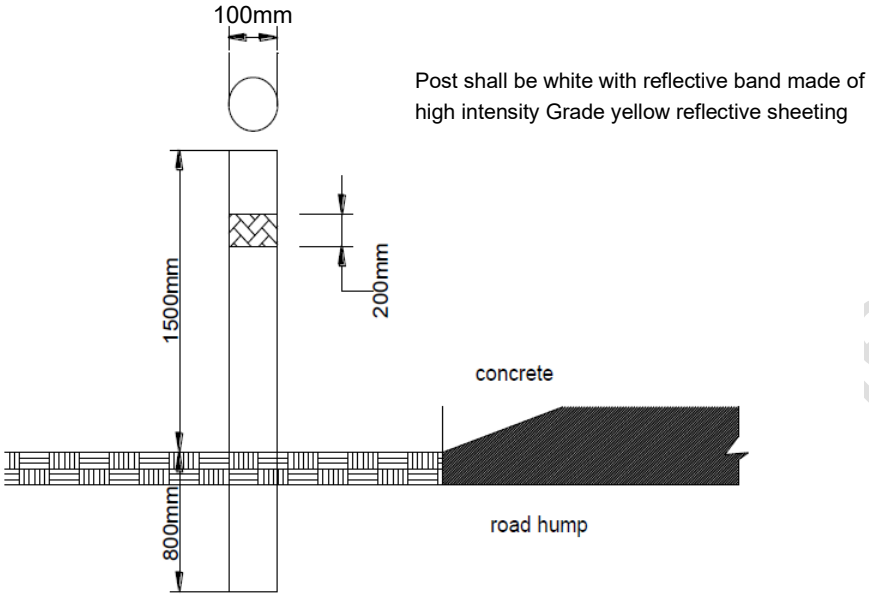

Figure 6 – Road Hump Marker Post

10. Maintenance

10.1 Regular inspection shall be conducted to ensure that the speed 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 Table 2 and clause 6.2.1 are in difference of more than 25 percent.

10.3 Painting and marking of existing speed humps shall be done on regularly in order to maintain their visibility to road users.

10.3 Rumble strips shall be maintained to ensure continued audible, tactile, and visual effectiveness, and reconstructed when wear or deformation has reduced their original dimensions.

11. Caution

11.1 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.

11.2 Speed humps constructed in high-risk areas shall not excessively slow down motorists so as to expose them to unnecessary danger.

Bibliography

[1] TZS 702 Specification for Road Humps and Rumble Strips

[2] KS 774: 2000, Specification for road humps,