SRI LANKA STANDARD 746 : 1986

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SPECIFICATION FOR

SHOVELS

SRI LANKA STANDARDS INSTITUTION

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Gr. 8

SRI LANKA STANDARDS INSTITUTION
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SPECIFICATION FOR SHOVELS

FOREWORD

This Sri Lanka Standard was authorised for adoption and publication by the Council of the Sri Lanka Standards Institution on 1986-06-06, after the draft finalised by the Drafting Committee on Shovels, had been approved by the Mechanical Engineering Divisional Committee.

All standard values given in this specification are in SI units.

Shovels are generally supplied complete with handles unless otherwise specified. Therefore the requirements of both handles and blades are dealt with herein.

In the preparation of this standard, note has been taken of the specifications of shovels presently being manufactured by leading local manufacturers. (see Table 1)

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observe or calculated, expressing the result of a test or an analysis, shall be rounded off in accordance with **SLS 102**. The number of significant figure to be retained in the rounded off value shall be the same as that of the specified value in this standard.

The assistance derived from the publications of the British Standards Institution and the Bureau of Indian Standards in the preparation of this standard is gratefully acknowledged.

1 SCOPE

This Sri Lanka Standard covers the requirements of general purpose shovels specified in **4**.

2 REFERENCES

SLS 102 Presentation of numerical values

SLS 122 Vickers hardness test

SLS 145 Rockwell hardness test

SLS 146 Brinell hardness test

SLS 263 Building timber
Part 2 - Permissible defects

SLS 428 Random sampling methods

3 NOMENCLATURE

Standard nomenclature as given in Figure 1 shall apply.

4 TYPES OF SHOVELS

Two types of shovels are specified as follows :

a) Square mouth shovel - (Figure 2) ; and

b) Round mouth shovel - (Figure 3).

5 REQUIREMENTS

5.1 Materials

5.1.1 *Blade*

The blade of shovel shall be manufactured from steel which shall conform to the following composition.

Constituent	Percent
Carbon	0.50 - 0.65
Silicon	0.40 max.
Manganese	0.50 - 0.90
Phosphorus	0.060 max.
Sulphur	0.060 max.

NOTE - If the raw materials are obtained from a source where the composition is not specified, the manufacturer should verify that the composition meets the specifications.

5.1.2 *Handle*

The handle shall be manufactured from any hardwood agreed between the manufacturer and the purchaser.

The timber shall be seasoned, tough and free from knots, shakes, or other defects except to the extent permitted for structural timber under 7 of SLS 263 Part 2 : 1974.

5.1.3 *Clasp or Crutch*

The clasp or crutch shall be manufactured from mild steel.

5.1.4 *Rivets or Pins*

The rivets or pins shall be manufactured from low carbon steel (minimum carbon 0.15 per cent).

5.2 Manufacture

5.2.1 *Blade*

The blade including socket shall be made in one piece without welded or riveted joints.

The thickness of the blade shall be greatest at the frog decreasing towards the sides and mouth and shall be not less than 1.75 mm. The socket top shall be shaped as in Figure 1 and a single rivet hole shall be provided to fix the handle on to the blade.

The blade of shovel shall be suitably hardened and tempered to meet the hardness requirements given in 5.5.

5.2.2 *Handle*

The handle shall conform to the dimensions shown in Figure 4 or Figure 5. It is recommended that immediately after manufacture the handles are given suitable treatment such as dipping in linseed oil to retard the changes in moisture content.

5.2.3 *Clasp or Crutch*

The clasp or crutch shall be manufactured as specified in Figure 4 or Figure 5 with rivet holes provided as indicated.

5.3 Finish

The blades shall be well formed and free from cracks, seams, splits and other defects. The rough edges of the socket of shovels, crutches and clasps, particularly at the meeting point with the handle shall be removed to prevent injury to the user's hands.

All exposed metal portions of the shovel shall be coated with suitable anticorrosive paint, except a portion of the blade, 50 mm width from the edge, which shall be clear lacquerd.

5.4 Dimensions

5.4.1 The dimensions and tolerances of shovel blade shall conform to Figure 2 and Table 1 or Figure 3 and Table 2.

5.4.2 The dimensions of the handle, clasp and crutch shall conform to Figures 4 and 5 and the end of the handle shall fit the socket of the shovel and also stem of the crutch or clasp.

5.4.3 In the essembled form the dimensions of the shovel shall conform to Figure 2 and Table 1 or Figure 3 and Table 2 as applicable.

5.5 Mechanical properties

The blade of shovel shall be hardened and tempered to produce a hardness within the range 380 HV to 480 HV or 39 HRC to 47 HRC or 360 HB to 445 HB when measured not less than 50 mm from the shoulder. (see 8.1)

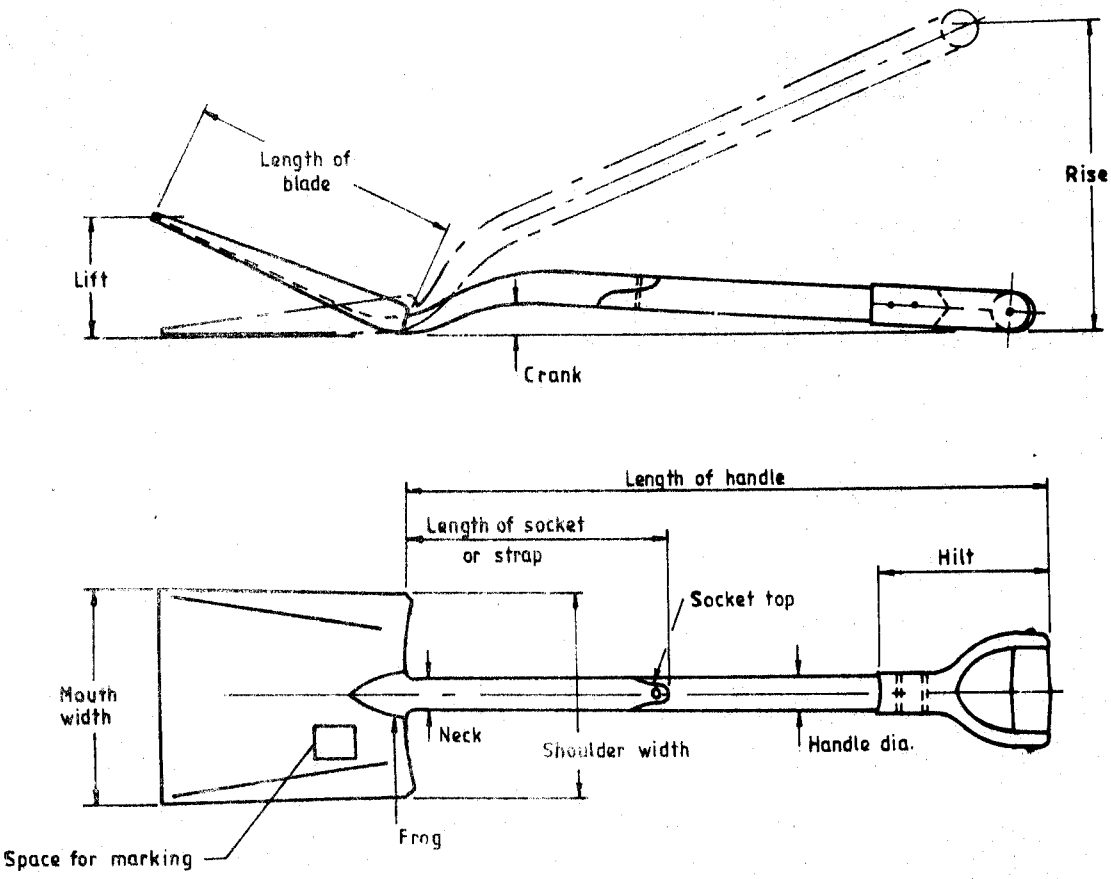


FIGURE 1 - Nomenclature of shovels

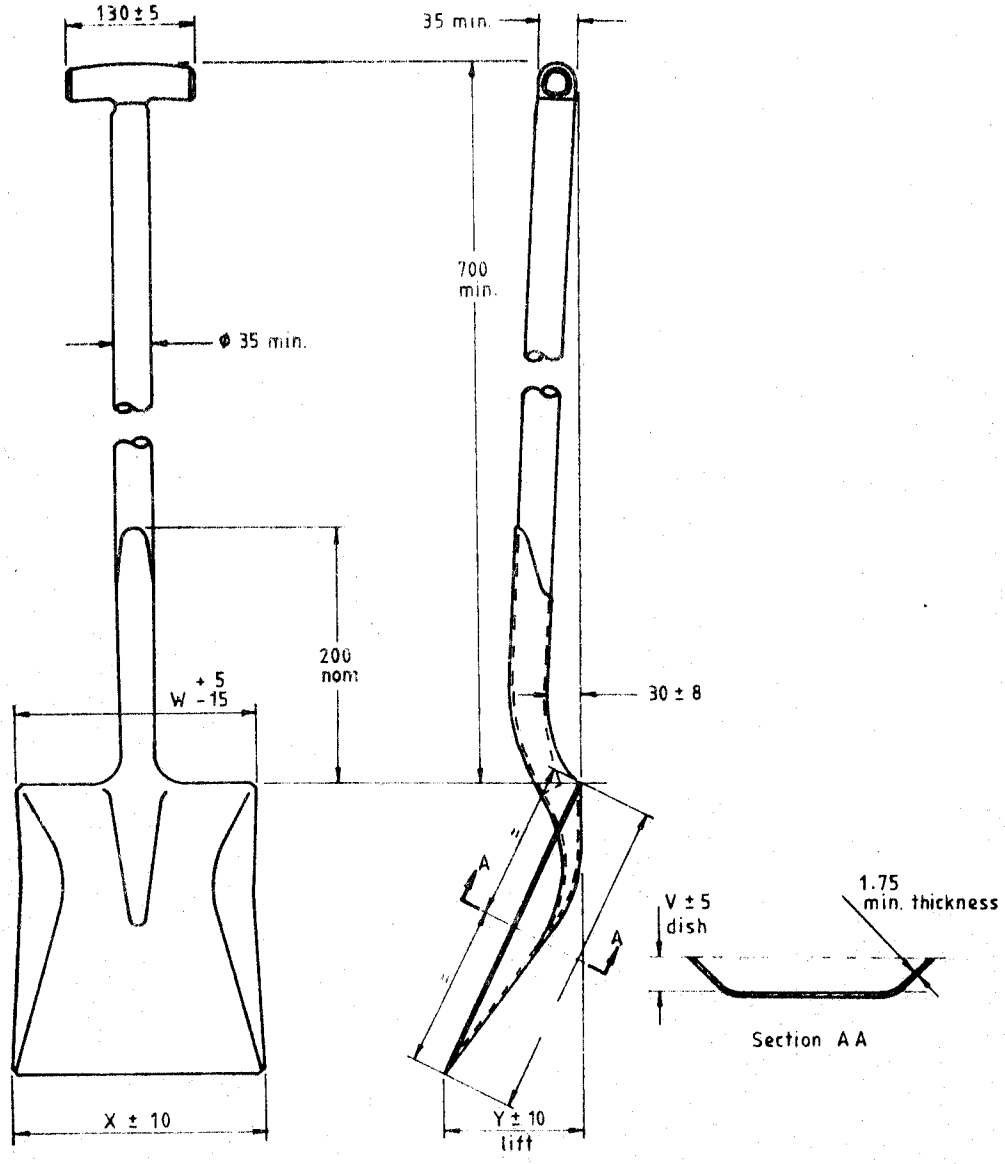


FIGURE 2 - Square mouth shovel

TABLE 1 - Blade dimensions for square mouth shovel

(All dimensions in millimetres)

Size W x Z (1)	Dish V (2)	Shoulder width W (3)	Mouth width X (4)	Lift Y (5)	Length Z (6)
240 x 320	35	240	250	140	320
260 x 350	40	260	280	160	350
300 x 350	40	300	300	180	350
320 x 400	45	320	340	190	400
238 x 311*	40	238	267	120	311

* *See Foreword*

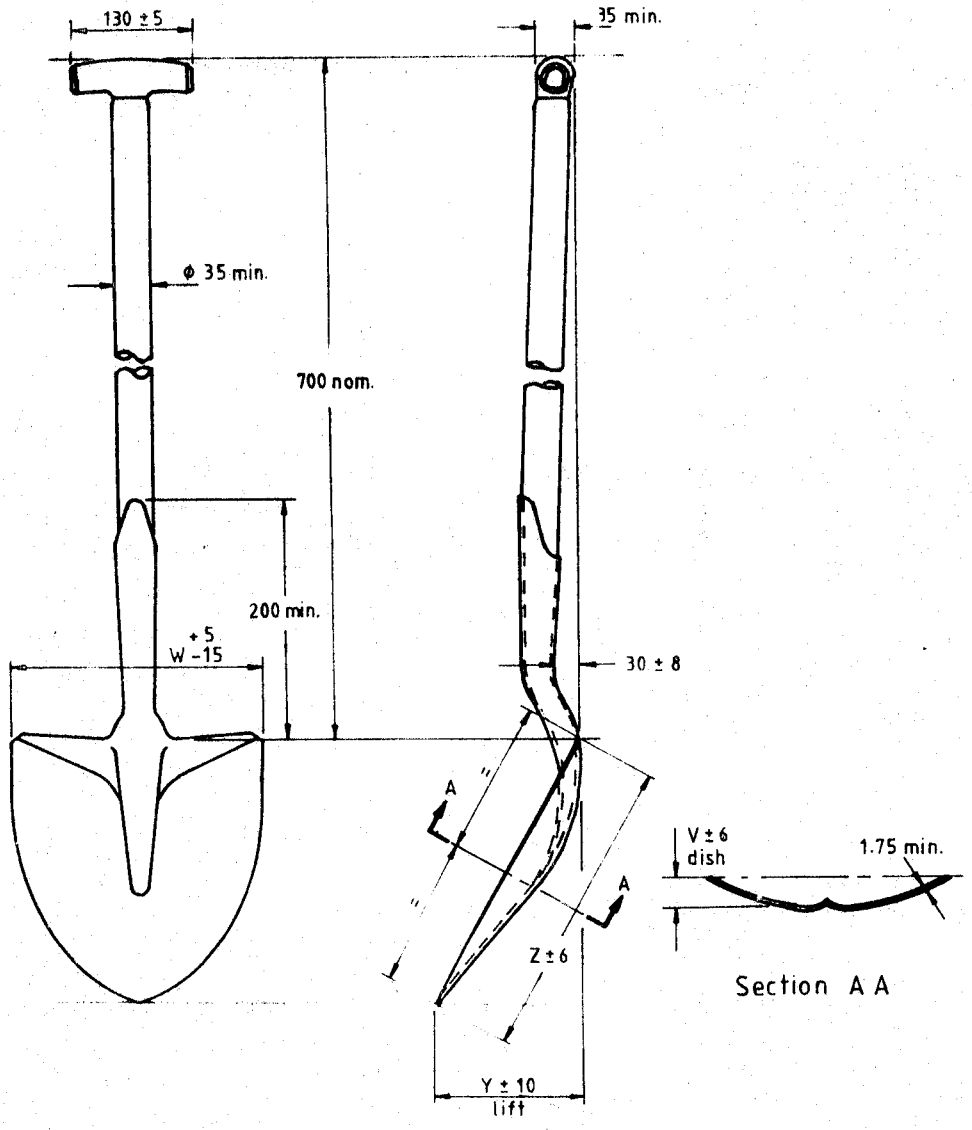
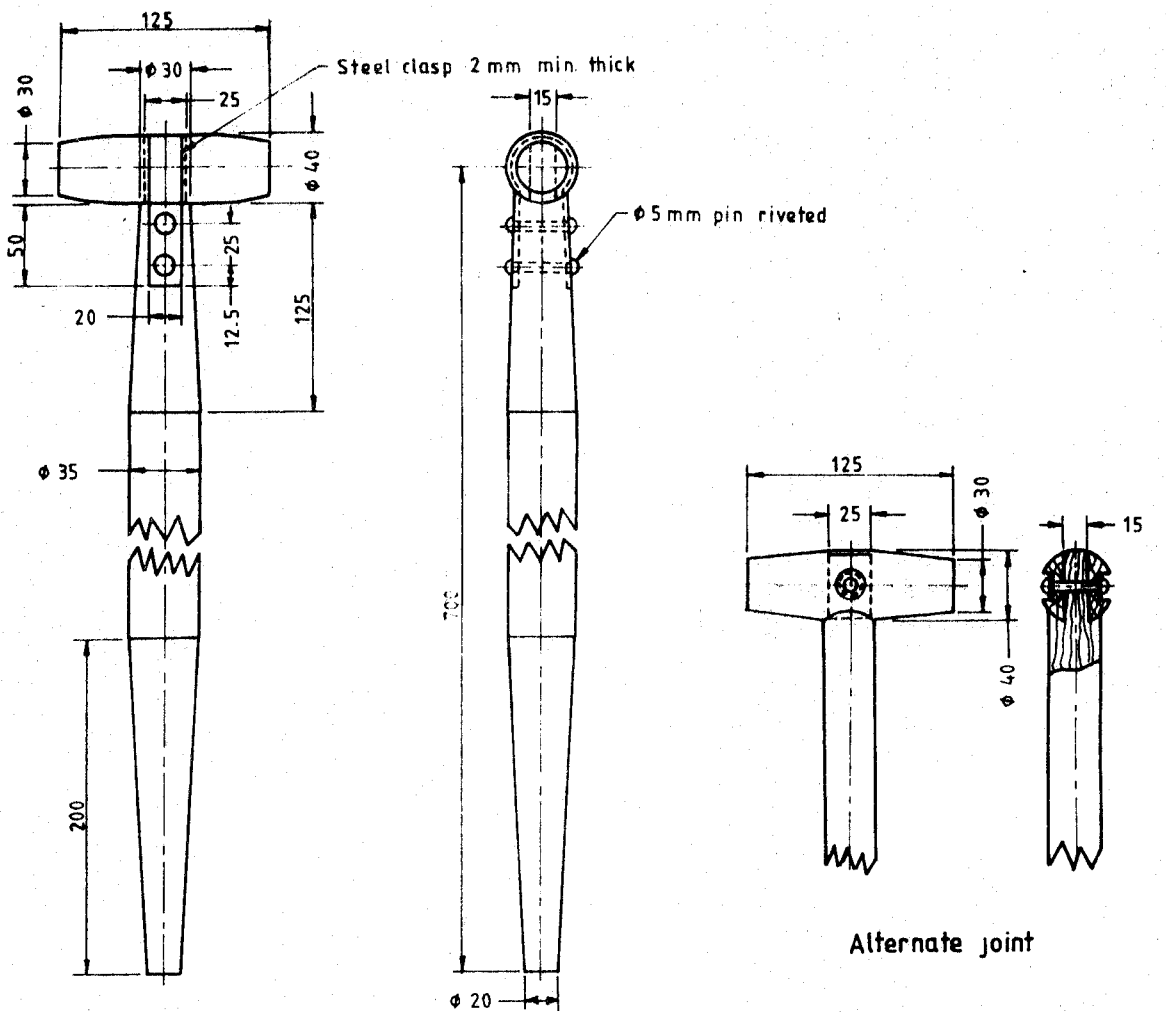


FIGURE 3 - Round mouth shovel

TABLE 2 - Blade dimensions for round mouth shovel

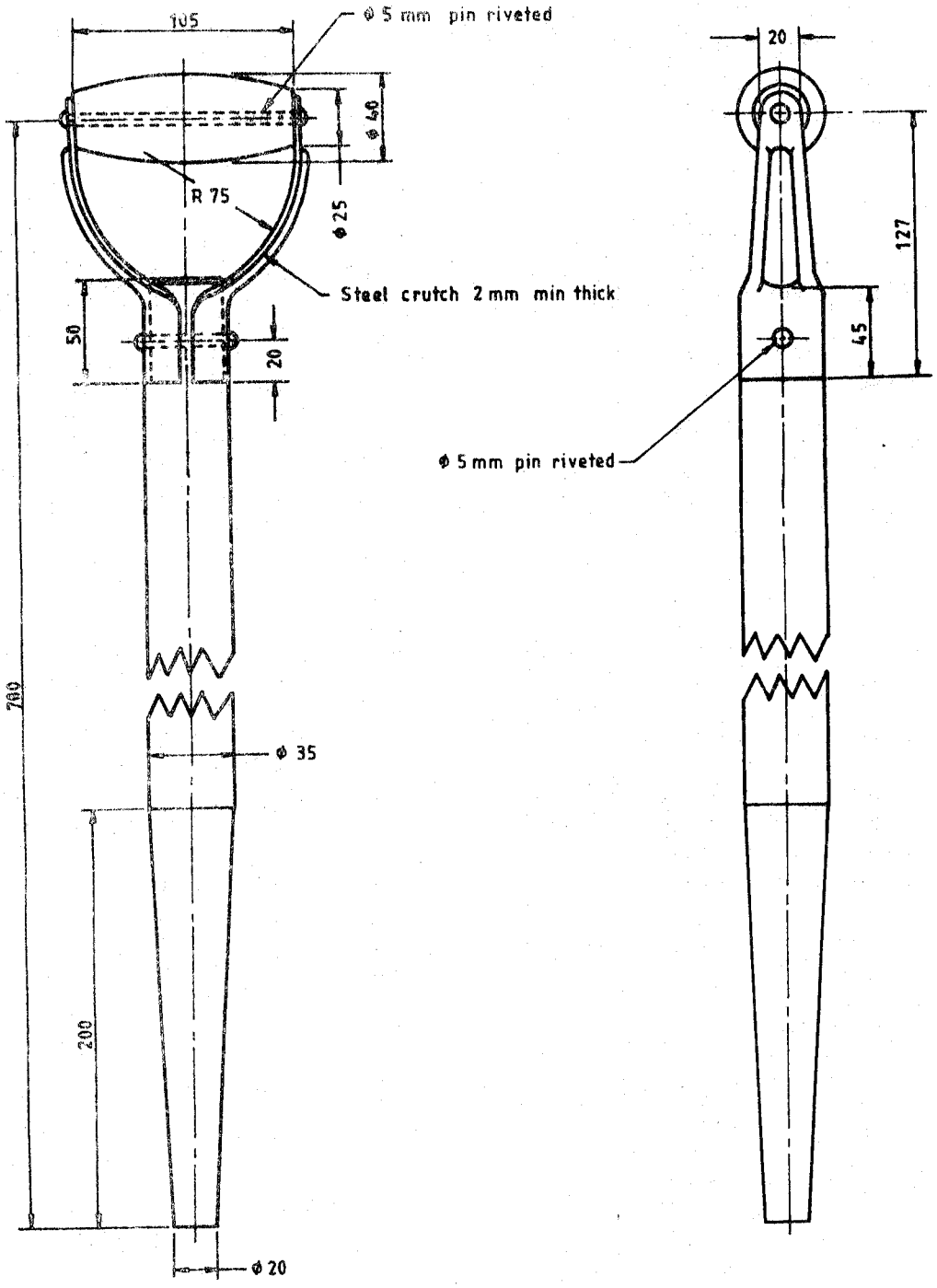
(All dimensions in millimetres)

Size (W x Z)	Dish V	Width W	Lift Y	Length Z
260 x 320	30	260	150	320
280 x 340	35	280	160	340
300 x 340	40	300	170	340



All dimensions in millimetres

FIGURE 4 - T - Type handle



All dimensions in millimetres

FIGURE 5 - Y - Type handle

6 MARKING

6.1 All shovels shall be legibly and indelibly stamped on the blade at the position indicated in Figure 1 with the following.

a) Manufacturer's trade mark ; and

b) Size (blade length x shoulder width)

7 PACKING

The shovels shall be securely packed in suitable packing cases or crates of size convenient for handling in transit. Each type and size of shovel shall be kept separate.

8 TESTING

8.1 Hardness

Hardness testing shall be in accordance with SLS 122 or SLS 145 or SLS 146.

8.2 Bending test

The shovel blade shall be securely clamped up to a position of 50 mm from the edge of the blade as shown in Figure 6. A pre-load of 25 kg shall be gradually applied by suspension from the end of the handle. The load shall be maintained in this manner for 1 minute and them removed.

A test load of 40 kg shall then be applied and maintained for two minutes. On removal of the load the shovel shall show no signs of damage or loosening of any component parts, nor shall there be any permanant set in excess of 25 mm measured vertically at the end of the blade.

9 SAMPLING

9.1 Lot

All shovels of same type and dimensions, manufactured under same conditions shall constitute a lot.

9.2 Scale of sampling

9.2.1 Samples shall be selected from each lot for ascertaining conformity of the lot to the requirements of this specification.

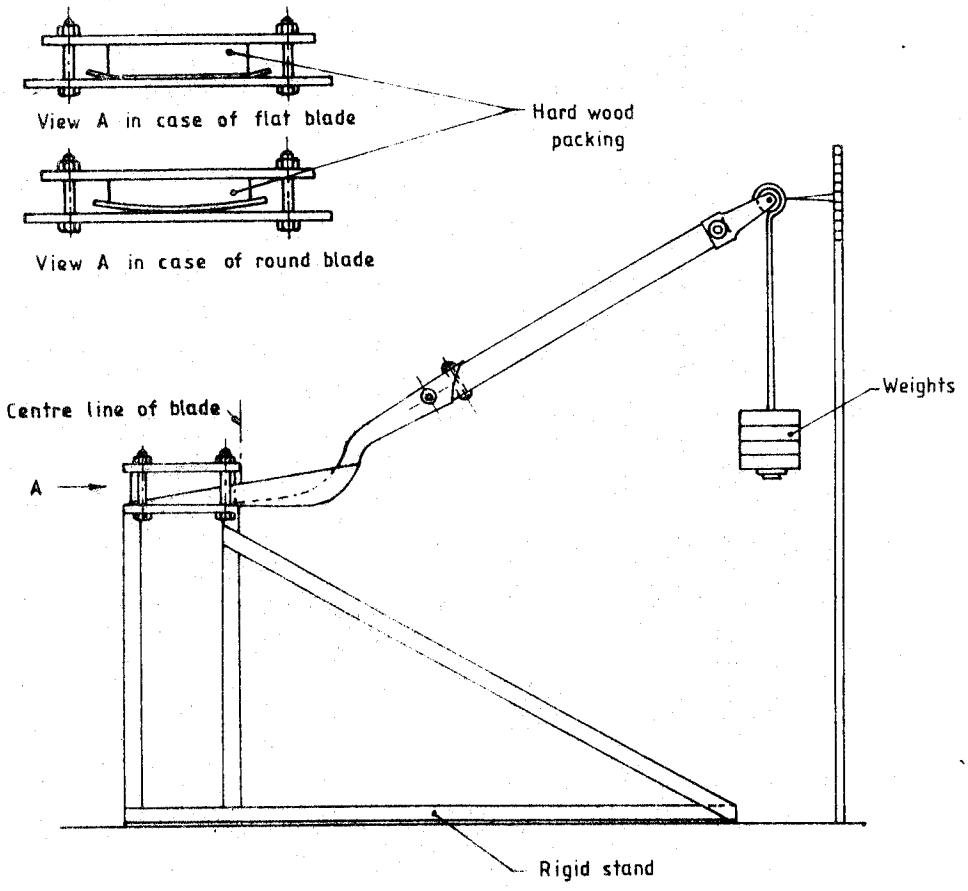


FIGURE 6 - Test set up for bending test

9.2.2 The number of shovels to be selected from the lot shall be in accordance with Column 2 of Table 3.

TABLE 3 - Scale of sampling

Number of shovels in the lot	Number of shovels to be selected	Acceptance number	Sub sample size
Up to 50	5	0	2
51 to 150	8	0	3
151 to 300	13	1	5
301 and above	20	2	8

9.2.3 The shovels shall be selected at random. In order to ensure randomness of selection random number tables as given in SLS 428 shall be used.

9.3 Number of tests

9.3.1 Each shovel selected as in 9.2.2 shall be examined for marking requirement.

9.3.2 Each shovel selected as in 9.2.2 shall be inspected for requirements given in 5.2, 5.3 and 5.4.

9.3.3 If the lot has been found satisfactory in respect of requirements when examined under 9.3.2, a sub sample of size given in Column 4 of Table 3 shall be selected and tested for the following requirements.

a) Hardness (see 8.1) ; and

b) Bending (see 8.2)

10 CRITERIA FOR CONFORMITY

A lot shall be declared as conforming to the requirements of this specification if the following conditions are satisfied,

10.1 Each shovel examined as in 9.3.1 satisfies the marking requirement.

10.2 The number of shovels not conforming to any one or more requirements when inspected as in 9.3.2 is less than or equal to the corresponding acceptance number given in Column 3 of Table 3.

10.3 All shovels of the sub sample when tested as in 9.3.3 satisfy the test requirements.

SLS CERTIFICATION MARK

The Sri Lanka Standards Institution is the owner of the registered certification mark shown below. Beneath the mark, the number of the Sri Lanka Standard relevant to the product is indicated. This mark may be used only by those who have obtained permits under the SLS certification marks scheme. The presence of this mark on or in relation to a product conveys the assurance that they have been produced to comply with the requirements of the relevant Sri Lanka Standard under a well designed system of quality control inspection and testing operated by the manufacturer and supervised by the SLSI *which includes surveillance inspection of the factory, testing of both factory and market samples.*

Further particulars of the terms and conditions of the permit may be obtained from the Sri *Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.*

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SRI LANKA STANDARDS INSTITUTION

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