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मानक

IS 9561 (1985): Code of practice for felling and conversion of trees into logs [CED 9: Timber and Timber Stores]



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Indian Standard CODE OF PRACTICE FOR REAFFIRMED 1990 FELLING AND CONVERSION OF TREES INTO LOGS (First Revision)

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August 1985

Indian Standard

CODE OF PRACTICE FOR FELLING AND CONVERSION OF TREES INTO LOGS

(First Revision)

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Indian Standard

CODE OF PRACTICE FOR FELLING AND CONVERSION OF TREES INTO LOGS

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 28 February 1985, after the draft finalized by the Timber Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Felling and conversion of trees into logs is a specialized job. Therefore, with a view to get the maximum yield from a tree it is desirable to follow certain well established methods of felling and observe necessary precautions before and during the felling.

0.3 This standard was first published in 1980 to give guidance for felling and conversion of trees into logs for general purposes. With the recent developments in the field of felling trees and their conversion into logs, need was felt to revise the provisions of this standard. As such, this revision has been prepared, wherein, while reviewing the recommendations, in general, major changes have been made in the provisions relating to methods of felling and the sequence of felling procedure.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of specified value in this standard.

1. SCOPE

1.1 This standard gives guidance for felling and conversion of trees into logs for general purposes.

^{*}Rules for rounding off numerical values (revised).

2. TERMINOLOGY

2.0 For the purpose of this standard the definitions given in IS: 707-1976* and the following shall apply.

2.1 Break-Off — The uncut wood fibres left between the felling cut and felling sink.

2.2 Bucking — Cross-cutting of the felled tree perpendicular to the axis of the log.

2.3 Butt-End — The bottom end of the felled tree where the felling cut is given.

2.4 Cable Puller — Device consisting of a system of lever pulley blocks and wire ropes employed to fell a tree in a given direction.

2.5 Delimbing — Cutting off the side branches of a felled tree flush to the stem.

2.6 Felling Cut — The cut given at the base of the tree for felling the tree which is on the side opposite the desired direction of fall of the tree and little above the felling sink.

2.7 Felling Sink — A notch cut at the base of the tree in the direction in which the tree is to be felled. It governs the direction of fall and also avoids splitting at butt-end (syn. under cut).

2.8 Kerf — The gap made by cutting the wood fibres.

2.9 Lopping — Cutting off small branches, twigs and rarely top of a standing tree.

2.10 Snouting — Rounding back of the whole of the front end edges of a log to ease skidding (syn. snipping).

2.11 Stem Tightner — A device consisting of a wire rope and lever mechanism for tensioning the wire rope. It is fixed just above the felling cut to avoid splitting of butt-end particularly in leaning trees and coniferous woods.

3. GENERAL RULES FOR FELLING

3.1 Tree shall be felled as near the ground level as possible leaving tree number and hammer mark intact on the stump portion.

3.2 Tree shall be felled in a manner and in the direction, which will eliminate or minimize the damage to itself and the surrounding vegetation.

^{*}Glossary of terms applicable to timber technology and utilization (second revision).

3.3 Tree shall be felled such that it will fall in a place where operations of bucking, conversion and further movement will be convenient and efficient.

3.4 Trees shall not be felled during a strong wind.

3.5 On slopes, felling of trees shall usually be started from the top and proceeded in the downward direction of the slope.

3.6 Trees shall generally be felled on the uphill direction on steep slopes.

4. METHODS OF FELLING

4.1 Depending upon tools employed in felling, a tree is normally felled by any one of the following three methods:

- a) With the axe alone,
- b) With the saw and axe combined, and
- c) With saw alone.

4.1.1 Felling with axe alone is not only wasteful but also dangerous and is, therefore, not recommended.

4.1.2 In case of felling with saw and axe combined, the lower and horizontal cut of the felling sink shall be made first and by the saw such that the chosen direction of fall of the tree is at right angle to this saw cut. The upper and slanting cut may be made by axe. The felling cut from the back side of the tree bole is given by saw only.

4.1.3 In case of felling with saw alone, the upper and slanting cut is also made by saw. The upper cut is made first such that the length of the saw blade is at right angle to the chosen direction of the fall of the tree. When sufficient depth of slant cut is made, the lower horizontal cut of the sink shall be made also by saw such that the two cuts meet and a notch is made by removal of a wood stub. Then the felling cut shall be given as usual by saw.

4.2 The technique of felling shall depend upon the condition of the tree, such as:

- a) Normal,
- b) Leaning,
- c) Unbalanced crown,
- d) Buttressed,
- e) Rotten or hollow at the base, and
- f) Forked.

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4.2.1 The break-off, that is, a portion of uncut wood fibres, also called the holding wood, shall be so manipulated in shape and size that the chosen direction of fall can be maintained in trees of unbalanced crown and leaning trees.

4.2.2 Wider width of the holding wood on the side opposite to the lean of the tree or heavier crown and branch can help in maintaining the chosen direction of fall determined by the direction right angle to the line of the lower cut of the sink.

5. PREPARATION BEFORE FELLING

5.1 The direction in which a tree is to be felled shall be decided before starting the operation.

5.2 The working site shall be cleared for handling the tools freely.

5.3 The felling tools shall be kept at a place where they are safe and easily approachable.

5.4 The workers shall decide a safe escape route to be followed when the tree is felling.

5.5 The tree shall be looped if its branches are likely to affect its fall or damage the surrounding crop.

5.6 The leaning trees and the trees on slopes shall be felled in the desired direction with the help of cable puller.

5.7 To avoid splitting of the butt-end of leaning tree, a stem tightner shall be fixed just above the felling cut line.

6. SEQUENCE OF FELLING PROCEDURE

6.1 General — After following the steps mentioned under 5, the procedure mentioned under **6.1.1** to **6.1.7** shall be followed for felling a normal tree. However, if the condition of tree is different, namely, leaning, buttressed, rotten and forked, felling techniques shall be modified as given under **6.2** to **6.5**.

6.1.1 The direction in which a tree is to be felled having been decided before starting the operation, the position of lower and upper cuts of the following sink shall be marked in the decided direction, such that the cutting saw blade length is at right angle to the desired direction of fall of the tree.

6.1.2 Felling sink shall then be cut, the depth of the lower horizontal cut shall not be more than one-third of the diameter of the tree at that place. In case of tree up to 50 cm dia the depth of sink shall be one-fourth of the diameter. This depth will, however, depend on the shape of the tree trunk and its lean and crown.

6.1.3 The horizontal cut of the sink shall be given by a saw to the decided depth. The slanting cut, above the horizontal cut, shall be given so that the two cuts meet to form a straight line. The sink cuts may be given by a saw or an axe (see **4.1.1** and **4.1.2**). A wedge shaped wooden piece, thus cut-off, shall be removed forming a sink at the bottom of the tree.

6.1.4 A mark for felling cut shall then be given on the other side of the sink. The felling cut shall be a little higher (2-3 cm) than the horizontal plane of the felling sink, depending upon the size of the tree.

6.1.5 Felling cut shall be given by a saw which shall run parallel to the inner line of the sink, that is, at right angle to the direction of fall and on the horizontal plane. Care shall be taken to ensure that the cutting plane of the felling cut never goes below the horizontal plane of the sink on the stump.

6.1.6 Sufficient and suitable type of break-off shall be left (see 7.3).

6.1.7 Wedges which help in felling the tree, in the direction of sink shall be inserted and hammered in accordance with **8**.

6.2 Leaning Tree — While felling a side lean tree, the width of the break-off should be less towards the leaning side and more towards the other side. More holding wood shall be maintained on the side opposite to the lean. Trees leaning more than 5° from the vertical axis, shall not be tried to be felled on opposite direction than lean without cable puller or other tensioning device. If the tree is to be felled on the direction of lean, the felling sink shall be deeper than normal or double sink shall be made to avoid sudden fall and damage to tree.

6.3 Buttressed Tree — If the tree is buttressed, the buttress should be removed with the help of axe first and the bole should be made cylindrical then only felling sink shall be made and felling cut given.

6.4 Rotten or Hollow Tree — When a tree is rotten or hollow at the base, and the defect is known before making sink, a cable puller shall be fixed to control the direction of fall. But if, while giving felling cut, the defect comes out, then it shall be cut cautiously thinking that the break-off is only at the sides and that there is no holding wood and fibres in the rotton portion.

6.5 Forked Tree — While felling a forked tree which forks at a height of less than 2 m, the tree shall be felled in two steps. Firstly, one fork shall be felled as a tree by giving felling sink and felling cut little above the fork. Then, the remaining part shall be taken from the bottom. For trees which fork at a height of more than 2 m from the ground, separate suitable provision shall be made to fell one fork first depending upon the height and orientation.

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7. PRECAUTIONS DURING FELLING

7.1 Two wood cutters may be allowed to work at the same time on one tree with separate axes provided they are well separated and work with good understanding.

7.2 There shall always be sufficient 'break-off' or uncut fibres left between the felling sink and felling cut so that the tree may not come down suddenly but slowly in chosen direction. These uncut fibres act as hinges.

7.3 The width of the 'break-off' or uncut fibres shall depend also upon the species. The stronger the species the lesser would be the break-off. Width of the break-off also depend on lean, crown and forked situation of the tree.

7.4 Where two or more trees are cut at a time, the distance between the crews shall be more than double the height of trees in question.

7.5 When the tree starts falling crew should take the escape route and a signal shall be given to other wood cutters working nearby.

8. WEDGING

8.1 Wedges help to increase the tendency of the tree to fall towards the direction of the sink and help remove saw jamming on the felling cut. These shall, therefore, be inserted in the kerf of felling cut for smooth running of the saw. Wedges should be put as soon as felling cut is deep enough to allow putting the wedge.

8.2 The number of wedges inserted in the kerf of felling cut should normally be odd in number, that is, 1, 3 and 5, so that one wedge will thrust on opposite sides.

8.3 Wedges shall be of iron preferably with wooden head.

9. CONVERSION OF THE FELLED TREE INTO LOGS

9.1 After felling, the butt-end of the hole shall be dressed properly.

9.2 The branches shall be delimbed or removed flush to the stem of the felled trees. Small branches may be removed by axe or bow-saw, large branches shall be cut by cross-cut saw.

9.3 The stem shall be marked for log lengths in best assortments as per requirements. While marking the lengths, defects like knots, bends, etc, shall be considered along with the transport facilities.

9.4 The stem shall be cut or bucked at the given marks by saw.

9.5 The saw cut shall be perpendicular to the axis of the log to avoid any oblique cut and end wastage of wood.

9.6 Cross-cutting (bucking) on undulating ground may cause damage to saw or splitting in the log end, which should be avoided. Cutting from above and cutting from below shall be adopted when tree trunk may be under tension or compression at the place of cutting.

9.7 Wedges are inserted for cross-cutting to facilitate smooth movement of the saw in the kerf.

9.8 The debarking or removal of the bark, if required, shall be done by scraping the bark with debarking spade or the bark may be removed by hand after beating it with axe head if it is thick such as in sal.

10. SNOUTING OR SNIPPING

10.1 Snouting or rounding off the ends of the logs shall be done by axe to prevent the front end of the log, stubbing into the ground, during its movements on ground.

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