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Indian Standard

CODE OF PRACTICE FOR
LAYING AND FIXING OF SLOPED ROOF
COVERING USING PLAIN AND CORRUGATED
GALVANIZED STEEL SHEETS

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

CODE OF PRACTICE FOR LAYING AND FIXING OF SLOPED ROOF COVERING USING PLAIN AND CORRUGATED GALVANIZED STEEL SHEETS

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Indian Standard

CODE OF PRACTICE FOR LAYING AND FIXING OF SLOPED ROOF COVERING USING PLAIN AND CORRUGATED GALVANIZED STEEL SHEETS

0. FOREWORD

0.1 This Indian Standard was adopted by the Bureau of Indian Standards on 30 June 1987, after the draft finalized by Building Construction Practices Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Sloped roof coverings using plain and corrugated galvanized steel sheets are generally used for storage sheds, godowns and factory buildings besides their extensive use in remote areas. These are easy and quick to erect and are economical. This type of construction is also popular in hilly areas and for temporary construction.

0.3 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 the specified value in this standard.

1. SCOPE

1.1 This standard covers the details of construction of roofs using plain and corrugated galvanized steel sheets.

2. MATERIAL

2.1 Steel Sheet — It shall conform to IS : 277 - 1985†. Grade of coating may be either 600 or 450 conforming to IS : 277 - 1985†.

*Ruels for rounding off numerical values (*revised*).

†Specification for galvanized steel sheets (plain and corrugated) (*fourth revision*).

2.2 Hook Bolts — Hook bolts shall conform to IS : 730-1978*. Steel bolts, nuts and washers shall be galvanised.

2.3 Screws — Screws where used for plain sheet shall conform to IS : 6739-1972†. Screws shall be galvanised.

3. NECESSARY INFORMATION

3.1 For efficient design and construction of sloped roofing with plain and corrugated steel sheet, detailed information with regard to following is necessary:

- a) Surface area to be covered;
- b) Type of supporting elements and restriction, if any, to their arrangements;
- c) Provision for Slope and other requirements for drainage;
- d) Provision for fixing ridge pieces and services; and
- e) Level at which roof is to be laid.

4. DESIGN CONSIDERATIONS

4.1 Spacing of Purlins — In addition to end purlins for each layer of sheets, at least one purlin should be placed (on simple rafter) to support sheets at mid way to avoid sagging. In case of fabricated roof trusses, the spacing of purlins are guided by the maximum distances.

<i>Thickness of Steel Sheet, mm</i>	<i>Maximum Spacing of Purlins C/C, m</i>
1·00	2·0
0·80	1·8
0·63	1·6

4.2 Ridge purlins shall be fixed 75 to 115 mm from the apex of the roof, that is, from the bolt point.

4.3 Laps — Sheet shall be laid with minimum end lap of 150 mm and side lap of two corrugations. The side and end laps may be increased to avoid cutting of sheets.

*Specification for Hook bolts for corrugated sheet roofing.

†Specification for slotted round head wood screws.

5. LAYING AND FIXING OF SHEETS

5.1 Laying — The sheets shall be laid on the purlins of other structural members as indicated, to a true plane, with the lines of corrugations truly parallel or normal to the sides of the areas to be covered, unless otherwise required as in special shaped roof.

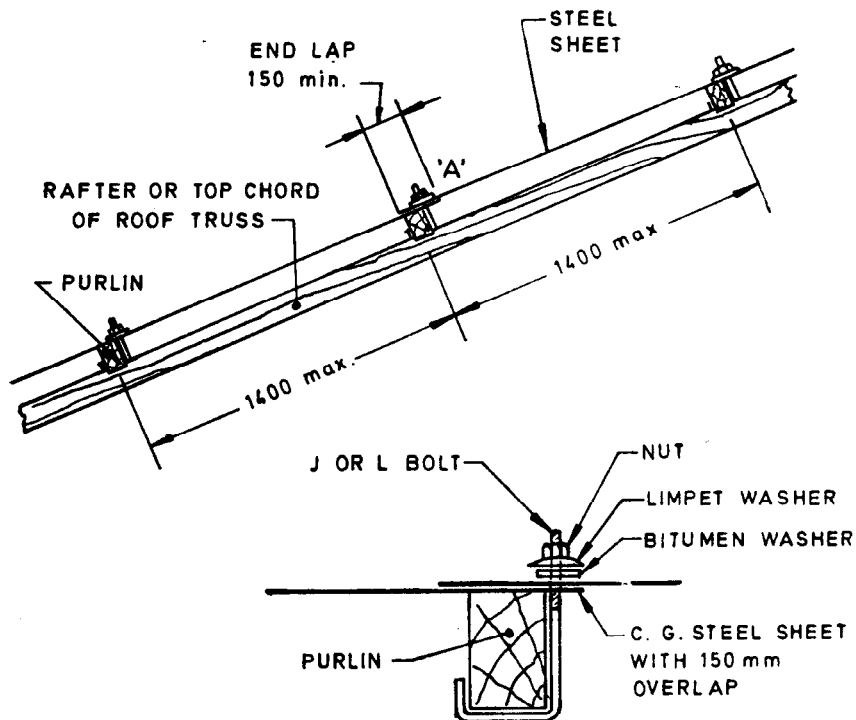
5.2 Fixing of Sheets — Laying of sheets shall be commenced from the lower end (bottom) of the roof. Longer length sheets shall be fixed first and then shorter length sheets fixed towards the ridge. Minimum 300 mm length of sheet should project beyond the edges of the purlins. For alignment of sheets, one piece of timber batten shall be fixed projecting up to the depth of purlin, on the first and last structural member (truss or rafter) and with both these batten pieces a thread shall be tied to check straightness, etc, and then the sheets shall be fixed. First, bottom layer of sheets shall be laid temporarily by means of 50 mm long nails. After laying all the sheets up to the ridge, permanent fixing shall be done by means of J or L hook bolts (see Fig. 1 and 2).

5.2.1 For fixing of sheets the cover shall be not less than 85 mm. The sheets shall be placed 'alternate', one sheet (the lower) being fixed with the edges turning away from the bearer or purlin to which the sheeting is fixed and the cover sheet on each side being fixed with the edges turning in towards the bearer or purlin.

5.3 Sheet shall be fixed to the purlins of other structural members with J or L, M6 or M8 hook bolts. The length of the hook bolt shall be varied to suit the particular requirements. The bolts shall be sufficiently long so that after fixing, it projects above the top of their nuts not less than 12 mm. The grip of J or L hook bolt on the side of the purlin shall be not less than 25 mm. There shall be a minimum of three hook bolts placed at the ridges of corrugations in each sheet on every purlin and their spacing shall not exceed 300 mm.

5.4 The spacing of these bolts shall not exceed 200 mm.

5.5 Sheeting on steel bearers, where indicated, shall be riveted together with 6 mm dia galvanized wrought iron rivets and galvanized plain round washers (two to each rivet), at intervals not exceeding 200 mm for the side lapse, and on every corrugation (staggered) for the end laps. The sheets may be riveted in sets of 9 to 12 on the ground and then hoisted in position. Care shall be taken in riveting that the sheet is well supported underneath and no indentation is made on the upper surface. Rivets shall be tightened and drawn closely and the heads spread evenly and equally.



ENLARGED DETAIL AT 'A'

All dimensions in millimetres.

FIG. 1 FIXING DETAILS OF STEEL SHEETS

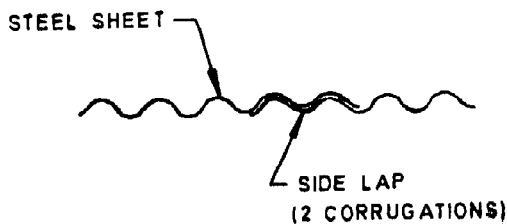


FIG. 2 DETAILS OF LAPPING

5.6 All holes for bolts, rivets, etc, shall be made in the crown of corrugations and shall be drilled (and not punched). The holes in the washers shall be of the exact diameter of the hook bolt. The nuts shall be tightened from above to give a leak-proof roof. Sheets shall not generally be built into gables and parapets. They shall be bent up along the side edges close to the wall and the junction shall be protected by the suitable flashing or bitumen mastic 'gola'.

6. RIDGES AND HIPS

6.1 Ridges and hips shall be covered with ridge and hip sections with a minimum 150 mm lap on either side over the roofing sheets, and shall be properly bent to shape and fixed. The end lapse of the ridges and hips, and between ridges and hips shall also be not less than 150 mm.

6.2 Ridges and hips shall be fixed to the roof members with J or L, M6 or M8 hook bolts. At least one of the fixing bolts shall pass through the end laps of ridges and hips on either side. If this is not possible, extra hook bolts shall be provided. The end laps of ridges and hips shall be joined together by M6 hook bolts. There will be at least two such bolts in each end lap. Laps shall be set in red lead. The edges of the ridges and hips shall be straight when fixed end to end and their surfaces should be plane and parallel to the general plane of the roof. The ridges and hips shall fit in squarely on the sheets.

7. VALLEYS AND FLASHINGS

7.1 Valleys and flashings of plain sheeting shall be of width and thickness as specified and bent to shape and fixed. They shall lap with the corrugated sheets not less than 150 mm width on either side. The end laps of valleys and flashing shall also be not less than 150 mm and painted with red lead.

7.2 Valley sheets shall be fixed to the roof members below with J or L, M8 hook bolts. At least one of the fixing bolts shall pass through the end laps of the valley pieces, on either side. If this is not possible, extra hook bolts shall be provided. The edges of valleys and flashing shall be straight from end to end. The surfaces shall be true and without bulges and depressions. Flashing shall be well and properly tucked into joints of brickwork or masonry, secured with hardwood wedges and the joints finished neatly to match the adjoining work.

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