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IS 1081 (1960): Code of practice for fixing and glazing of metal (steel and aluminium) doors, windows and ventilators [CED 11: Doors, Windows and Shutter]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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IS : 1081 -1960
(Reaffirmed 2006)
REAFFIRMED

Indian Standard

CODE OF PRACTICE FOR
FIXING AND GLAZING OF METAL
(STEEL AND ALUMINIUM) DOORS,
WINDOWS AND VENTILATORS

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(Including Amendment No.1)

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

Indian Standard

**CODE OF PRACTICE FOR
FIXING AND GLAZING OF METAL
(STEEL AND ALUMINIUM) DOORS,
WINDOWS AND VENTILATORS**

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AMENDMENT NO. 1 OCTOBER 1980

TO

IS:1081-1960 CODE OF PRACTICE FOR FIXING
AND GLAZING OF METAL (STEEL AND ALUMINIUM)
DOORS, WINDOWS AND VENTILATORS

Alterations

[Page 4 (page 5 of Reprints), clause 3.1] -
Substitute the following for the existing clause

'3.1 Putty - Putty used for glazing metal door,
window and ventilator shall conform to IS:419-
1967.'

(Page 5 of Reprints, foot-note) - Delete.

[Page 8 (page 9 of Reprints), clause 6.12,
second and third sentences] - Substitute the
following for the existing sentences:

'It is recommended to fix by wood screws into
wooden plugs or filler plugs or rawl plugs
positioned in the concrete. These plugs shall
be set in the concrete when pouring or casting
and shall be set very accurately for fixing
holes in the unit.'

[Page 12 (page 13 of Reprints), clause 10.5]
Substitute the following for the existing clause:

'10.5 Glass shall be secured by special spring
glazing clips (see IS:1038-1975 regarding number
of clips) which shall be inserted in holes already
provided in steel door, window or ventilators
before applying the front putty.'

[Page 12 (page 13 of Reprints), clause 10.6] -
Delete and renumber the subsequent clauses
accordingly.

(EDC 11)

Indian Standard

CODE OF PRACTICE FOR FIXING AND GLAZING OF METAL (STEEL AND ALUMINIUM) DOORS, WINDOWS AND VENTILATORS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 25 June 1960, after the draft finalized by the doors, Windows and Building Furniture Sectional Committee had been approved by the Building Division Council.

0.2 Indian Standard Specification for Steel Doors, Windows and ventilators (*IS : 1038-1957) covers the requirements for steel doors, windows and ventilators for general buildings and Indian Standard Specification for Steel Windows for Industrial Buildings (IS : 1361-1959) covers the requirements for industrial windows. Specifications for the same units using extruded aluminium alloy sections are under preparation. The utility of metal doors, windows and ventilators depends very largely on the manner in which fixing and glazing are carried out. Fixing and glazing here refer to securing metal doors, windows or ventilators in structural or masonry surrounds, fixing fittings and accessories and securing glass to the metal frame. The work needs to be carried out by skilled and qualified craftsmen. The methods of fixing and glazing adopted should be such that movement of the structure to which the securing is done does not transmit strain to windows, doors or ventilators. This code has been prepared with a view to providing essential guidance in this regard.

0.3 Every installation presents its own problems and different surround details may require different techniques. Further, doors, large composite windows and bay windows are rather complicated to install and wherever special windows are being fixed, a careful study of the drawings and specialized training and skill are called for. A trained fitter in metal window fixing knows how to make adjustments to bring a window out of wind and to take out any twist or bend in the section. Close adherence to the practices detailed in this code will greatly assist in getting the job correctly done.

*Since revised.

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0.4 Generally the responsibilities of the fixer and glazer and various other parties concerned are not clearly stated or understood and that has led to some confusion in the work being carried out. The generally accepted conditions governing fixing and glazing, except where otherwise agreed to between the parties are given in Appendix A for general information.

0.5 This standard requires reference to the following Indian Standards:

***IS : 401-1954 CODE OF PRACTICE FOR PRESERVATION OF TIMBER
(Tentative)**

IS : 420-1953 SPECIFICATION FOR PUTTY, FOR USE ON METAL FRAMES

0.5.1 Wherever a reference to any Indian Standard mentioned under **0.5** or otherwise appears in this code, it shall be taken as a reference to the latest version of the standard.

0.6 Metric system has been adopted in India and all quantities and dimensions in this standard have been given in this system. Non-metric values to which the industry has been accustomed are also given in brackets, wherever necessary, for the sake of smooth changeover by December 1966.

0.7 This code is intended chiefly to lay down recommended methods of fixing and glazing of metal doors, windows and ventilators, and does not include all the necessary provisions of a contract.

1. SCOPE

1.1 This code covers the recommended methods for fixing and glazing of steel and aluminum doors, windows and ventilators.

2. TERMINOLOGY

2.0 For the purpose of this code, the following definitions shall apply.

2.1 Coupling — Joining door, window or ventilator units, side by side or one on the top of another or any combination of these units with mullions or transomes.

2.2 Fixing — Securing metal door, window or ventilator to prepared structural or masonry surrounds and fixing of fittings and accessories.

*Second revision in 1967.

†Since withdrawn. [See IS : 419-1967 Specification for putty, for use on window frames (first revision) .]

2.3 Flange — The flange of the metal section on the inside is called 'inner flange' and the flange exposed to the outside is called the 'outer flange'.

2.4 Glazing — Securing of glass in the metal door, window or ventilator.

2.4.1 Glazing Bead — Strips of metal or timber used for glazing in addition to putty.

2.5 Holdfast — A metal lug used for fixing door, window or ventilator.

2.6 Jamb — The vertical sides of the door, window or ventilator opening.

2.7 Mastic — A weather proofing compound usually with a putty base which remains pliable and plastic.

2.8 Putty Bedding — Putty which is placed in the glazing rebate of the door, window or ventilator into which glass is bedded.

2.9 Putty Back — Portion of the bedding putty remaining between the glass and rebate after the glass has been pressed into position in the glazing rebate of the section.

2.10 Putty Front — Putty forming a mitred filling between the surface of the glass and the front edge of the section.

2.11 Rendering — Plastering of the outside face of the wall and the outer reveal.

2.12 Reveal — The depth of the wall revealed beyond the frame in the sides of the opening. The reveal on the inner side is called the 'inner reveal' and the reveal exposed to outside is called the 'outer reveal'.

2.12.1 Flush Reveal — A reveal which is not rebated.

2.12.2 Rebated Reveal — A reveal which forms an angle or sometimes a groove into which the outer flange of the steel window section fits.

2.13 Still (Cill) — The lower boundary of a door, window or ventilator openings.

2.14 Threshold — The portion of the door frame which is fixed to floor.

2.15 Unit — Refers to the door, window or ventilator.

3. MATERIALS

3.1 Putty — Putty used for glazing metal door, window or ventilator shall conform to *IS : 420-1953.

*Since withdrawn. [See IS : 419-1967 Specification for putty, for use on window frames (first revision) .]

3.2 Mastic — The requirements of mastic used in fixing metal door, window and ventilator shall be as agreed to between the purchaser and the supplier.

4. TYPE AND SIZE OF OPENINGS

4.1 Types of Openings — Metal doors, windows or ventilators may be required to be fixed to either masonry openings (including brick, concrete, stone and marble) or timber openings or steelwork openings.

4.1.1 Masonry Openings — Masonry openings may be either rebated or flush, and in either case they may either have external rendering applied or be 'fair-faced' (that is, without external rendering). It is usual for stone and marble masonry to be fair-faced.

4.1.2 Timber Openings — Timber openings are invariably rebated.

4.1.3 Steelwork Openings — Steelwork openings vary in detailed design, but shall be so designed that the outer flange of the door, window or ventilator frame sections overlaps a steel surface either externally or internally.

4.2 Size of Openings — The overall size of both flush or rebated openings to which the units are to be fixed shall allow a clearance between frame and opening, and the amount of clearance depends on whether the opening is externally rendered or fair-faced.

4.2.1 Flush Openings — Rendered flush openings shall allow a clearance between frame and opening equal to the thickness of the rendering (*see* Fig. 1A and 1B). Fair-faced flush openings shall allow a clearance of 3 mm (or $\frac{1}{8}$ in) between frame and opening (*see* Fig. 2).

4.2.2 Rebated Openings

- a) Fair-faced masonry openings and timber openings shall allow a clearance of 3 mm (or $\frac{1}{8}$ in) between the opening and the inner flange of the frame as well as between the opening and the outer flange of the frames. The depth of rebate shall therefore be equal to the distance between the inner and outer flanges of the door, window or ventilator frame. The rebate shall be 12.5 mm (or $\frac{1}{2}$ in) in the case of general building and industrial windows (*see* Fig. 3A, 3B and 4).
- b) Rendered masonry openings shall allow a clearance of 3 mm (or $\frac{1}{8}$ in) between the opening and the inner flange of the frame and a clearance equal to the thickness of the rendering between the opening and the outer flange of the frame. The depth of rebate shall therefore be adjusted accordingly (*see* Fig. 5).

4.2.3 Steelwork openings shall be designed to allow the outer flange of the window frame section to overlap the steel surface by 10 mm (or $\frac{1}{2}$ in) (see Fig. 6A).

NOTE -- The sizes of Indian Standard doors, windows and ventilators, both for general building and industrial purposes, are designed for modular openings 12.5 mm (or $\frac{1}{2}$ in) which are larger all round than the doors, windows, etc. This gap of 12.5 mm (or $\frac{1}{2}$ in) is for the purpose of fixing of the units in the openings. In the case of masonry openings the gap is filled up with mastic cement and plaster after the unit is in position. In the case of steel or timber modular openings, extra steel or timber fillets will be necessary to cover this gap of 12.5 mm (or $\frac{1}{2}$ in) (see Fig. 6B).

5. HANDLING OF DOORS, WINDOWS AND VENTILATORS

5.1 Care shall be taken in unloading and stacking windows and ventilators at site. They shall be examined for any damage that may have occurred in transit and shall then be stacked upright (on their sills) on level ground, preferably on wooden battens and shall not come into contact with dirt or ashes. Doors shall be stacked upside down, with the kick plates at the top. Doors shall not be allowed to stand for long the right way up before being fixed so as to avoid the doors getting out of true and the hinges being strained and the shutters dropping.

5.2 Care shall be taken in ensuring that aluminium frames are not allowed to get into direct contact with wet cement and mortar. During the period of storage, aluminium should be protected from loose cement and mortar by means of suitable covering such as tarpaulin.

The tarpaulin should be hung loosely on temporary framing to permit circulation of air to prevent condensation.

6. PROCEDURE FOR FIXING SINGLE UNITS

6.1 Doors, windows or ventilators shall be fixed into prepared openings. They shall not be 'built-in' as the walls go up as this practice often results in brickwork being brought right up to the frame with no clearance allowed and usually distorts the units and increases the likelihood of damage being done to the unit during subsequent building work. Placing of scaffolding on the frames or glazing bars shall on no account be done.

6.2 The size of the opening shall first be checked and cleaned of all obstructions. The position of the unit in the reveal shall be taken off the drawings and a vertical chalk line shall be marked on the reveal at the jams, using a plumb-line, at the correct distance from the face of the wall (see Fig. 7). This chalk line shall also be run along head sill of the opening.

6.3 The fixing hole positions shall be taken from the unit and marked on this chalk line at the corresponding points. In case of masonry, holes

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for fixing the lugs or holdfasts shall be cut 5 cm (or 2 in) square and 5 cm to 10 cm (or 2 in to 4 in) deep, unless it is possible to put slotted lugs into joints in brickwork. In the case of concrete or stone, fixing plugs are recommended to be embedded in the masonry during construction at the appropriate places.

6.4 To ensure that all units are set at the appropriate heights in their openings, the datum line for the sill of the door, window or ventilator shall be taken from a fixed point on the wall or from finished floor or ceiling with the help of a level. The datum level for the sill of the door, window or ventilator unit shall be given by the builder to the fixer.

6.5 Door, Window and Ventilator units shall be checked to ensure that they are square and working satisfactorily. The unit shall then be set in its opening by using wooden wedges at jambs, head and sill, and shall be plumbed to the line chalked round the reveal. A spirit level shall be used to ensure that the frame is square and true and free from any warp and twist. When adjusting to the correct line, the wedges shall be struck with the hammer, care being taken so as not to strike the frame. The wedges shall not be inserted so firmly as to distort the frames, and wherever possible, they shall be placed near the points where a glazing bar meets the frame.

6.6 The unit shall be put in position and the lugs screwed on tight. Every hole in the frame need not be fixed with a lug; some holes are incidental to manufacture (being guide holes for the welding jig) and are not necessarily fixing holes. Lugs shall be placed in the specified positions.

6.7 The lugs shall then be grouted into their holes with cement mortar, and the wedges round the frame shall be left in position until this cement has hardened and the lugs firmly set (*see* Fig. 1). The gap between unit and surround shall then be filled with cement mortar while fixing to flush openings.

6.8 When fixing to flush surrounds without rendering, the 3 mm (or $\frac{1}{8}$ in) clearance round the frame shall be pointed with mastic on the outside. This mastic shall be applied after the unit has been fixed into position and before the internal plaster is applied. The mastic shall be applied from inside, squeezed into the channel of the frame until it oozes out through the narrower outside joint. The internal gap shall be filled about one-third with mastic and rest of the space be filled with cement mortar. The mastic shall then be cut off square outside and smoothed down (*see* Fig. 2).

6.9 When fixing to flush surrounds with internal plaster and rendering, the plaster and rendering shall be applied to surrounds after the lugs have firmly set taking care to keep it clear of hinges and not to bring it too close to the opening frame of casement. Hinges shall be wrapped in gunny to prevent plaster from adhering to them or being splashed on

them. Before applying the rendering, the joint of unit and the mortar shall be pointed with mastic from the outside.

6.10 When fixing to rebated surrounds without rendering, the frame shall be bedded in mastic. This shall be applied freely to the channel of the outside frame before offering it up to the rebated opening. In the case of the sill the mastic shall be applied to the sill of the opening and the unit placed on it with the other three sides 'battered' with mastic. After the unit is firmly fixed in position, surplus mastic shall be cut away and smoothed down (*see* Fig. 3A and 3B).

6.11 When fixing to rebated surrounds with rendering, after fixing as in 6.10, plaster shall be applied on the outside. The hinges shall be wrapped with gunny before plastering to prevent plaster from adhering to them or being splashed on to them.

6.12 When fixing to concrete, lug may be used, but the reinforcing rods in the concrete usually prevent the holes for the lugs being cut to the required depth. It is recommended to fix by wood screws into plugs positioned in the concrete. These plugs may be wooden blocks set in the concrete when pouring or casting; but these have to be set very accurately for the fixing holes in the unit.

6.12.1 In case the plugs could not be set in accurately, the fixer shall drill and plug the surrounds. White metal plugs are recommended for this purpose from the point of view of efficiency in fixing (*see* Fig. 3B).

6.13 Dressed stone and marble surrounds shall be drilled and plugged for wood screws in the same manner as recommended in 6.12.

6.14 Wood surrounds shall normally be rebated and when fixing to these mastic shall be applied to the sill of the opening and the unit placed on it with the jambs and head battered with mastic. This shall be applied freely to the channel of the outside frame before offering it up to the rebated opening. The unit shall be screwed with wood screws (*see* Fig. 4).

6.15 When fixing to steelwork, mastic shall be applied as described in 6.14 and the unit shall be fixed with special fixing clips supplied with the unit (*see* Fig. 6A) or with nuts and bolts (*see* Fig. 6B).

6.16 The external doors normally have a threshold (*see* Fig. 8). When doors are required for internal use, the threshold shall be substituted with a flat tie bar. In this case, the door shutters shall be of usual size, but as 4 cm (or 1.5 in) finish has to be allowed for over the structural floor level, a special base tie bar shall be fixed to the jamb member of the frame which projects below the finished floor (*see* Fig. 9).

NOTE --- Doors which are required for internal use are not required to have a threshold. This shall be specified at the time of placing the order as substitution of a flat tie bar for threshold is not possible after the door has been fixed.

6.17 In case of aluminium frames, the surfaces that will be anchored in direct contact with masonry, metal or wood surrounds, shall be protected with 2 coats of alkali-resistant bituminous paint, to avoid direct chemical attack from alkaline or acid solutions formed by moisture and the surrounding materials.

6.18 All splatter and drips from wet cement and plaster during fixing of aluminium frames should be removed immediately.

7. FIXING MATERIALS

7.1 The materials for fixing of doors, windows or ventilators to the surrounding shall be as given in Table I.

TABLE I MATERIALS FOR FIXING OF DOORS, WINDOWS AND VENTILATORS

SL No.	SURROUND AND METHOD OF FIXING	FIXING MATERIAL
i)	When fixed to wooden frame rebated on the outside	38 mm (or 1½ in) × No. 10 galvanized wood-screws.
ii)	When fixed to plugs in concrete, stone or brick work rebated on the outside	do
iii)	When fixed to plugs in concrete, stone or brick work not rebated on the outside (that is, plain or square jambs)	63 mm (or 2½ in) × No. 10 galvanized wood-screws
iv)	When fixed direct to brick work or masonry (that is, plain or square (jambs)	Slotted steel adjustable lugs of sizes shown in Fig. 10.
v)	When fixed to steelwork	Standard clips and 8 mm (or ⅝ in) galvanized bolts with hexagonal nuts.

8. PROCEDURE FOR FIXING COMPOSITE UNITS

8.0 General — The fixing procedure for composite doors, windows and ventilators shall generally be the same as described in 6 and in addition shall conform to provisions laid down in 8.1 to 8.6.

8.1 Where larger units are formed by coupling individual units altogether, the mullions and transomes shall be bedded in mastic to ensure weather tightness. Mastic shall be applied liberally to the channels of the outside frame sections before assembly, and the two units being coupled shall be drawn together tight with clamps, the mastic being squeezed

out and cut off neatly when the units shall be screwed together tight (see Fig. 11A to 11H).

8.2 Coupling screws vary in length for different types of coupling but manufacturers shall supply correct sizes and quantities, if coupling requirements are detailed when ordering. A common fault is to use coupling screws too long for the particular coupling and to leave a length of screw projecting through the frame of the unit to interfere with the closing of the casement or with the glass of fixed light. The offending length of screw shall be cut off, if this occurs.

8.3 If a composite unit is coupled in such a way that there is a cross joint of mullion with transome, the shorter coupling unit shall run through unbroken. Mullions normally project 2.5 cm (or 1 in) at head and sill into the brick, stone or concrete surround. Fabricated steel mullions shall be cut short when fixing to wood or steel surrounds or when meeting a continuous transome, so as to form a butt joint and aluminium mullions shall be supplied with ends cut to profile of window frame.

8.4 Transomes shall be made to project 2.5 cm (or 1 in) into brick, stone or concrete jambs, where the transome is the member which runs through unbroken in a cross coupling. Transomes may be cut to match the outer or inner flange of the frame section, as appropriate, or cut to profile of the frame section in the case of aluminium.

8.5 Pockets shall be cut in the surround to appropriate depth to take the projection of the coupling member, when cutting holes for lugs.

8.6 Doors, Windows and Ventilators may have tubes as vertical coupling members to allow coupling at any desired angle so as to form a bay composite unit. Standard galvanized iron pipes of nominal 25 or 32 mm (or 1 in or 1¼ in) inside diameter are suitable for this purpose. After carefully setting out the unit to determine the exact angle required, the tube mullions shall be drilled and tapped with holes to match the fixing holes in the door, window or ventilator frame. Tube mullions are normally supplied by the manufacturer ready drilled and tapped and therefore full details of the setting out of the bay shall be provided when ordering.

Caps and bases of steel plate of suitable thickness and area shall be welded to the top and bottom of tube mullions where these are required to bear a load. Otherwise tube mullions are non-load bearing and shall project 2.5 cm (or 1 in) at head and sill as in 8.3 (see Fig. 12A to 12E).

Mastic shall be applied to tube mullions as described in 8.1, and the outside joints subsequently pointed.

9. FITTINGS AND HARDWARE

9.1 Any hardware, if fixed in position, shall be removed before fixing the unit in the surround and the moving part shall be secured with wire or string during erection and while the building work is being completed to prevent damage to the part.

9.2 Hardware shall be fixed as late as possible preferably just before the final coat of paint is applied. It shall be fitted in a workmanlike manner, so that it may not work loose, and in such a way that screws and pins are not marked and mutilated by hammers and screw drivers. It shall be tested for correct operation.

9.3 When side hung casement are fitted with friction hinges, the hinges shall be adjusted to the required tension by adjusting the nuts on top and bottom hinges equally. If one hinge is tighter than the other the casement may get twisted when opening or closing, and there is a consequent danger of breakage of the glass panes.

9.3.1 The friction required depends on the location. In an exposed site where high winds are expected, more friction is needed than in a sheltered location. For average conditions the normal setting of a friction hinge requires a pressure of 10 kg/cm² (or 14 lb/in²) to overcome it. Friction shall be measured with gauges or judged. From time to time the nuts may require slight adjustment, but oil shall not be used on friction hinges.

9.4 Whereas the friction hinges are of the projecting type, the side hung casements may have ordinary projecting type or non-projecting type hinges. The projecting type hinges project approximately 6.5 cm (or 2.5/8 in) and enable the outside surface of the glass panes to be cleaned from the inside. In case of double shutter casements the outside surface of the glass can be cleaned even though the hinges are not of the projecting type. But in the case of all other side hung casements projecting hinges are necessary from the point of view of cleaning. The projecting hinges also enable the opening shutter of door or window to fold back against the wall which is not possible with the non-projecting type. In order to enable the door or window shutters to fold back, the doors or windows shall be set in the reveal as shown in Fig. 13A and 13B.

10. GLAZING

10.1 Before glazing, all opening parts shall be checked to see that they are closing correctly and are well bedded and not twisted in any way.

10.2 The weight of glass in a side hung casement causes it to drop slightly on its hinges. Before glazing, therefore, the casement shall be

set in a slightly high position in its frame. The glass shall also be set slightly out of square in the frame, that is, high and towards the outside (handle) jamb. This can be effected by using little springs of wood to wedge the glass at certain points (see Fig. 14).

10.3 In case of newly galvanized doors, windows or ventilators not exposed to the weather for at least three months, difficulty may be experienced when glazing as the putty may fail to stick to the frames. To overcome this, a thin film of raw linseed oil shall be applied to the glazing rebate with cloth soaked in linseed oil.

10.4 The frame shall be completely cleaned and bedding putty shall be placed in the rebate before glazing. Glass shall then be cushioned into this bedding putty properly and shall be fronted with front putty which shall stop 2 to 3 mm (or $\frac{1}{8}$ to $\frac{1}{4}$ in) from the sight line of the back rebate to enable the painting to be done up to the sight line, to seal the edge of the putty to the glass. The back putty which has oozed out over the glazing rebate shall then be cut off square and smoothed down. This back putty is necessary as apart from preventing contact of the glass with the steel at any point; it will also prevent glass rattle and the ingress of moisture which may corrode the steel frame.

10.5 For doors and windows where pane size exceeds 60 × 30 cm (or 24 × 12 in) glass shall be secured by special spring glazing clips which shall be inserted in holes already provided in the steel doors or windows, before applying the front putty.

10.6 For outside glazed windows where pane sizes do not exceed 60 × 30 cm (or 24 × 12 in) spring glazing clips are not considered necessary.

10.7 When glazing very large panes of glass, or when heavy wind pressure may be experienced or in any case where specially desired by the user, glazing bead may be used instead of front putty.

10.8 When glazing with bead instead of front putty, putty shall be applied to the face of the bead which is in contact with glass, and back putty would also be necessary.

10.8.1 Beads shall be of durable timbers of Class I and Class II specified in IS : 401-1954* or of rustproof steel or of aluminium. The bead shall have mitred corners.

10.8.2 The position and size of the bead may depend on the thickness of glass used. The bead shall be fixed with screws spaced not more than 10 cm (or 4 in) from each corner and not more than 20 cm (or 8 in) apart and the doors or windows shall be drilled during manufacture with holes accordingly.

*Second revision in 1967.

10.9 The standard sections for domestic and industrial windows are not suitable for double-glazing units, which require deeper rebates and glazing nibs. Special frames, or special inserts for standard frames as agreed between the purchaser and the vendor shall be used in such cases.

11. FINISHING

11.1 The site finishing of doors, windows and ventilators shall assure two purposes:

- a) protection of the metal (in the case of ungalvanized material), and
- b) decoration of the assembly (for both galvanized and ungalvanized material).

11.2 Site finishing shall consist of the application of an undercoat and a finishing coat of paint, after any necessary touching up. In the case of aluminium frames site painting is not necessary.

11.2.1 In the case of ungalvanized surfaces, the undercoat need not necessarily contain rust inhibitive ingredients as it is not in direct contact with the steel. It shall however be highly resistant to moisture and to physical and chemical disintegration by the weather, and compatible with the priming coat used by the manufacturer. Lead-based paints are generally suitable, but in case of doubt the manufacturer shall be consulted.

The final finishing coat, chosen to suit the decorative scheme shall also conform to the above composition to a lesser degree. It shall be a tough, hard, smooth paint designed for external use, and compatible with the undercoat.

11.2.2 In the case of galvanized surfaces, the primary consideration for the undercoat is to obtain good adhesion. Adhesion to newly-galvanized work is difficult to obtain, and consequently natural and chemical etching or the application of a suitable primer shall be carried out before applying finishing coats. Natural etching is achieved by weathering for several months before painting. The main disadvantage here is being able to judge when the frames have been sufficiently weathered. Chemical etching is achieved by treating with a copper-free mordant solution; these mordants are usually based on phosphoric acid. The main disadvantage of this method is entrapment of mordant solution in crevices where it can destroy the coating and even promote corrosion. The safest method is by application of a primer based on calcium plumbate, where all that is necessary is to clean down (normal practice) before applying the paint. The calcium plumbate content of the pigment in such a primer shall be not less than 70 percent. The final finishing coat on galvanized work shall be similar to that specified for ungalvanized surfaces in 11.2.1.

11.2.3 Care shall be taken to see that the putty receives adequate coats of paint and shall be dry and hard before painting. It is advisable to carry the paint slightly beyond the edge of the putty-glass junction line to be certain of sealing the junction line (*see 10.4*).

11.2.4 On no account shall non-ferrous parts, that is, handles, stays, catches, etc, be painted.

11.2.5 Paint shall not be applied to working parts, such as handle pins, hinge pins, etc, where it can impede free action.

APPENDIX A

(*Clause 0.4*)

NORMAL CONDITIONS GOVERNING FIXING AND GLAZING

A-0. The normal conditions governing fixing and glazing except where otherwise agreed between the parties concerned usually include the following and are given as general guidance.

A-1. The fixing and glazing contractor shall cut holes to brick or hollow concrete block; where fixing is to steelwork or reinforced concrete, hole shall be left ready in correct position by the general contractor in accordance with the drawing to be provided by the manufacturer of doors and windows.

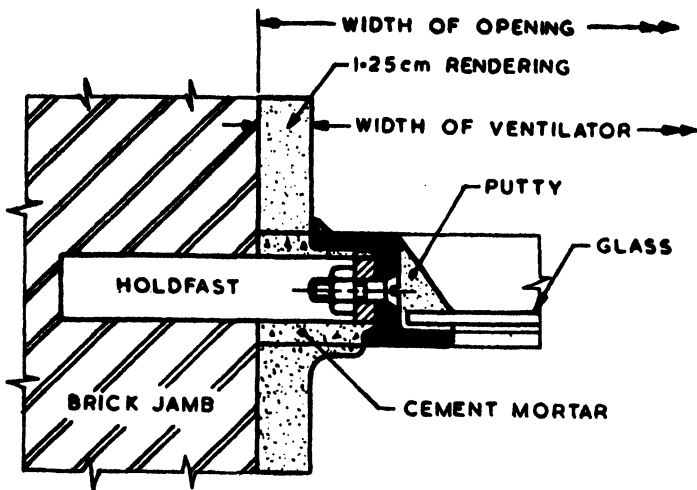
A-2. The fixing and glazing contractor shall fix the units to prepared openings with sills ready in position. If openings are not made to size, are not plumb, etc, it shall be the responsibility of the general contractor to correct these openings.

A-3. The fixing and glazing contractor shall be responsible for grouting and making good of doors, windows or ventilators, into openings; all rendering and plastering work in the reveals shall, however, be carried out by the general contractor.

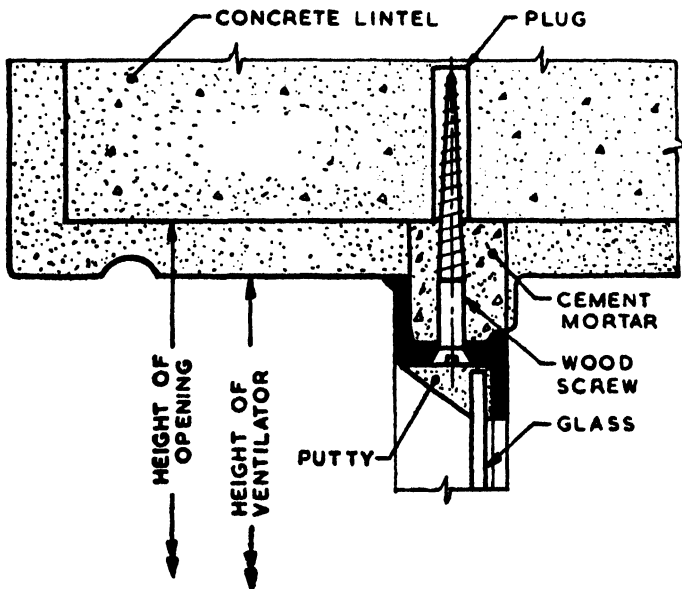
A-4. It is usual for all necessary scaffolding to be provided, erected and dismantled free of charge for the fixing contractor by the general contractor.

A-5. The fixing and glazing contractor shall not be responsible for washing down or cleaning of glass panes. He shall, however, when finishing the work leave doors, windows, ventilators and the glass panes clean and free from any dirt, putty or other adhering material.

A-6. The fixing and glazing contractor shall not be responsible for painting the doors, windows and ventilators.



IA



IB

FIG. 1 MASONRY OPENINGS FLUSH WITH RENDERING

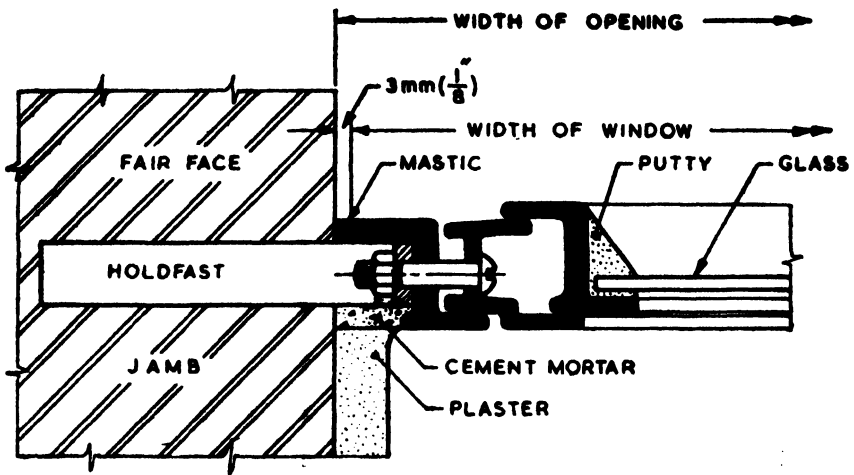
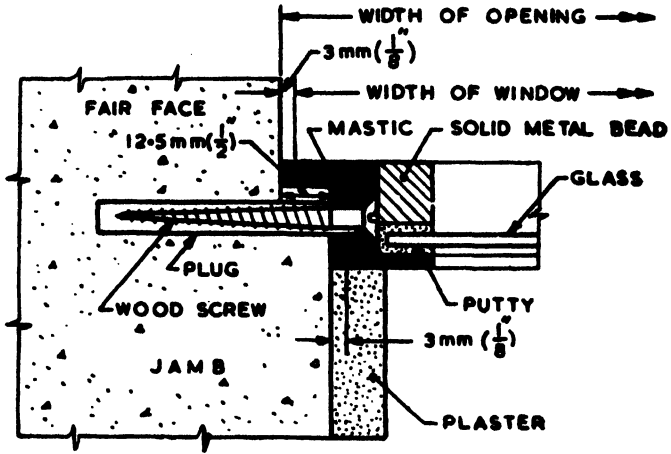
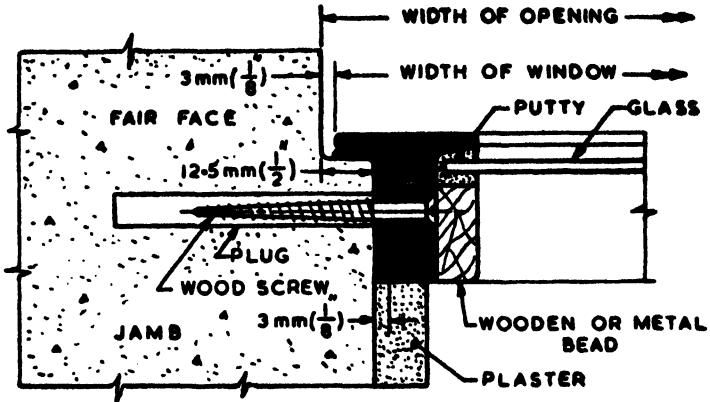


FIG. 2 MASONRY OPENINGS FLUSH WITHOUT RENDERING



3A



3B

FIG. 3 MASONRY OPENINGS REBATED WITHOUT RENDERING

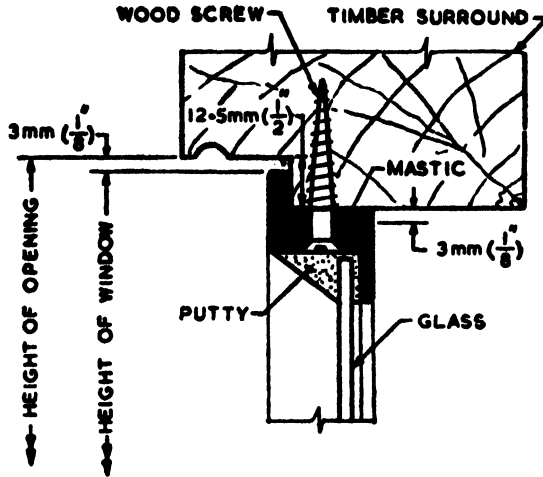


FIG. 4 FIXING TO WOOD SURROUND

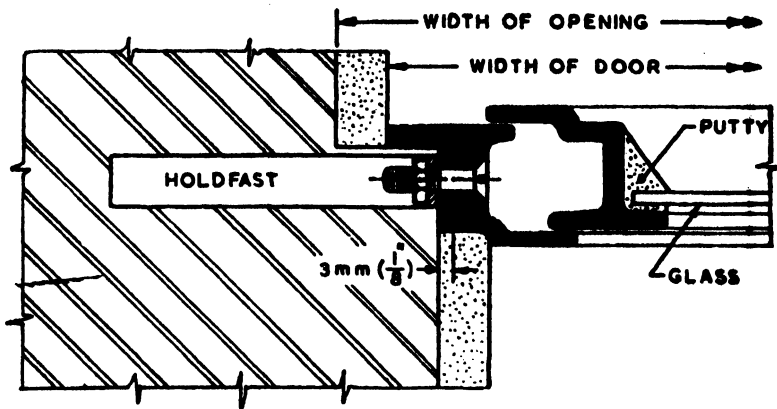
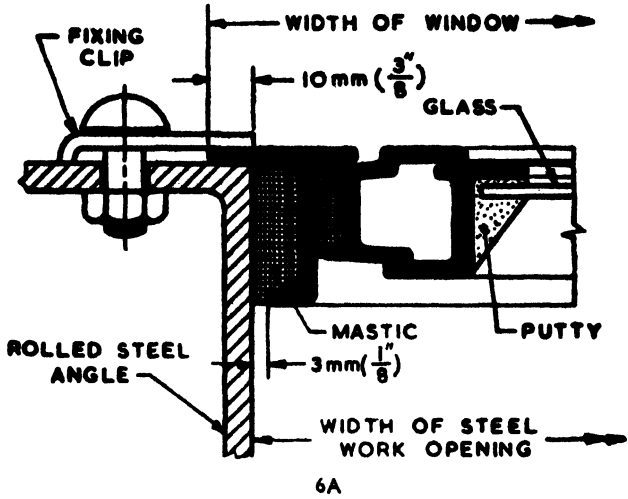
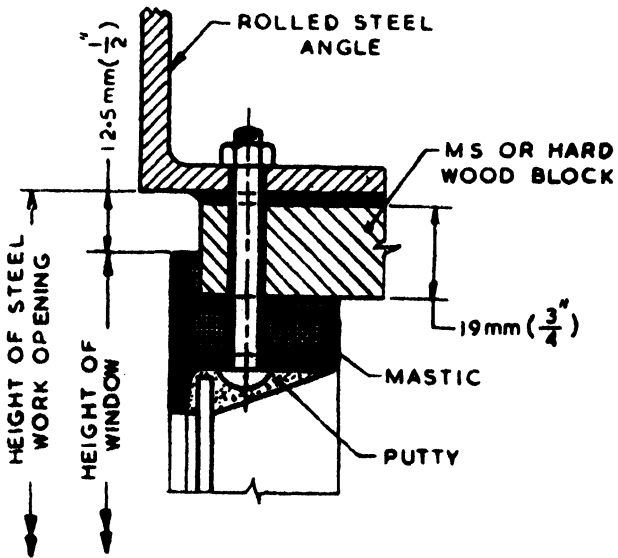


FIG. 5 MASONRY OPENINGS REBATED WITH RENDERING



6A



6B

FIG. 6 DETAILS OF FIXING WINDOW TO STEELWORK

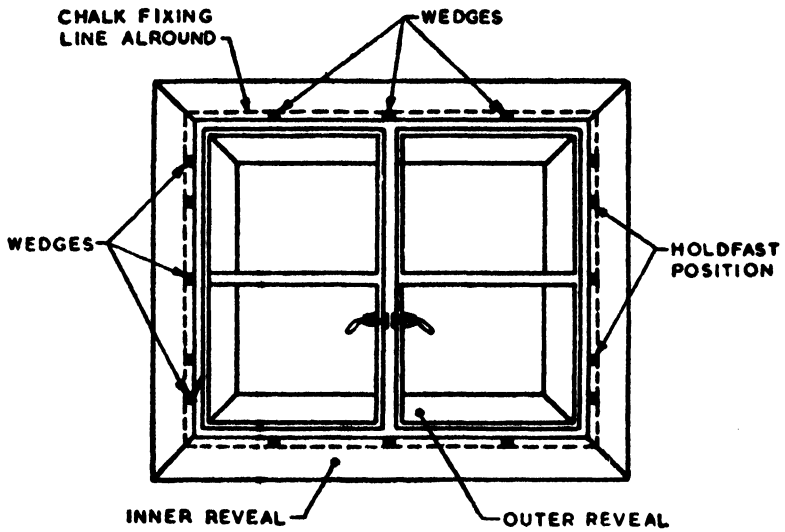


FIG. 7 FIXING WINDOW IN POSITION

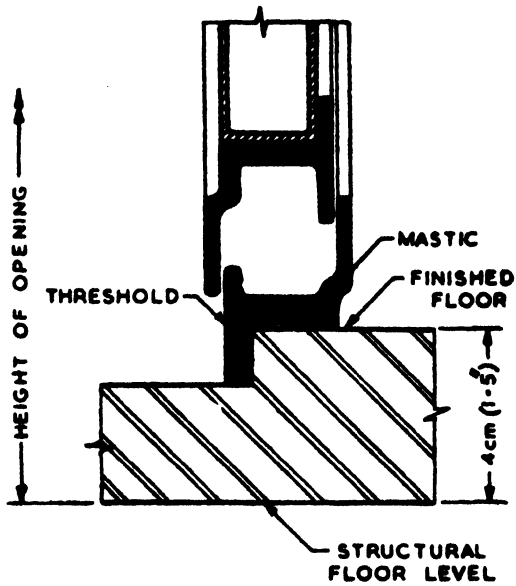


FIG. 8 THRESHOLD DETAIL FOR EXTERNAL DOOR

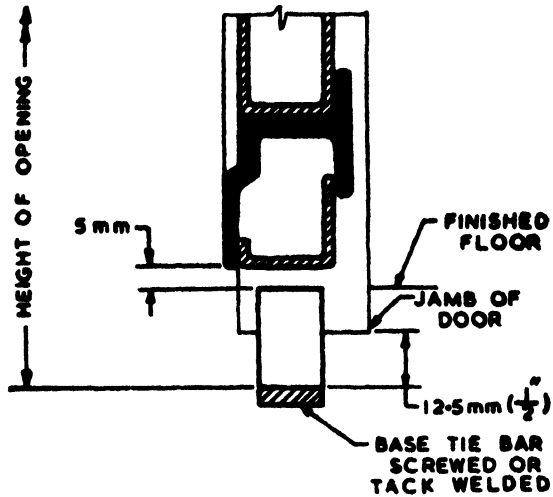
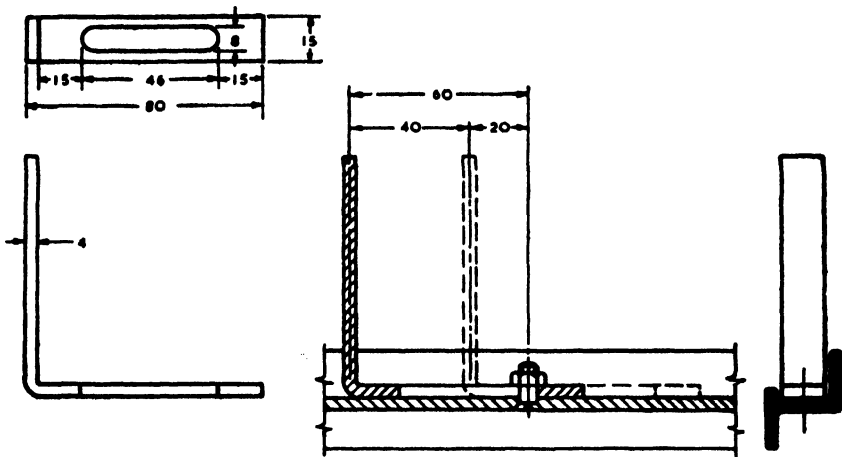


FIG. 9 THRESHOLD DETAIL FOR INTERNAL DOOR



All dimensions in millimetres.

FIG. 10A SLOTTED REVER-
SIBLE FIXING LUG

FIG. 10B FIXING LUG IN POSITION

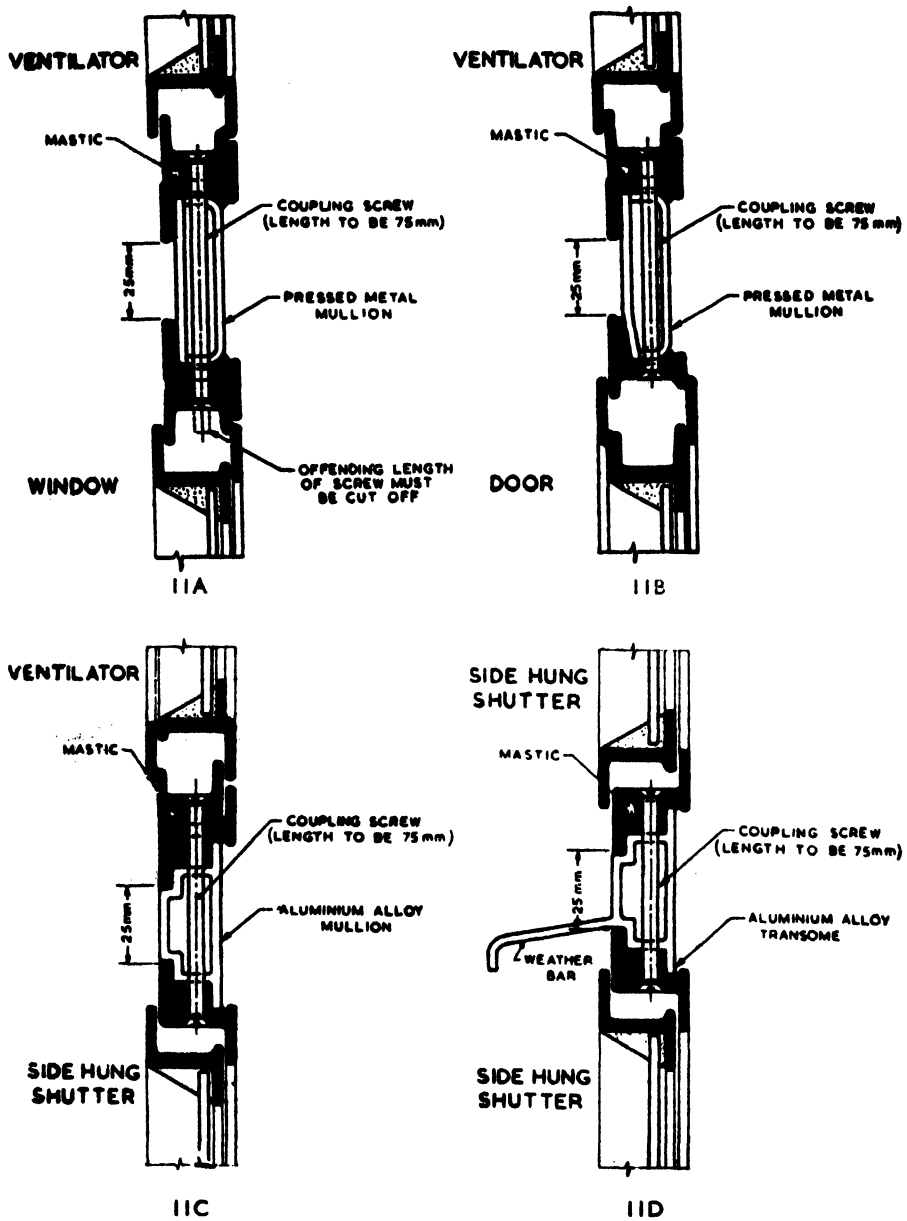


FIG. 11 FORMING OF COMPOSITE DOORS, WINDOWS AND VENTILATORS

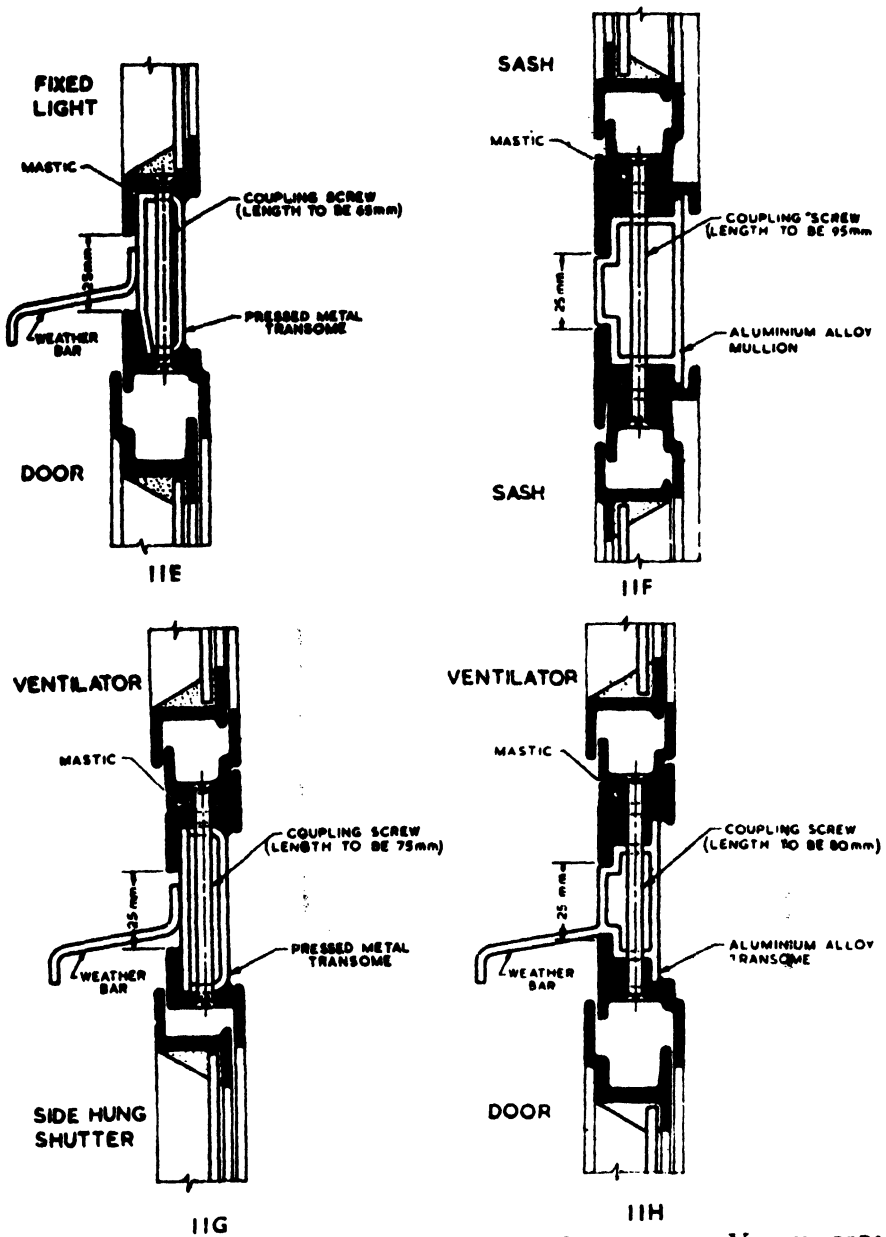
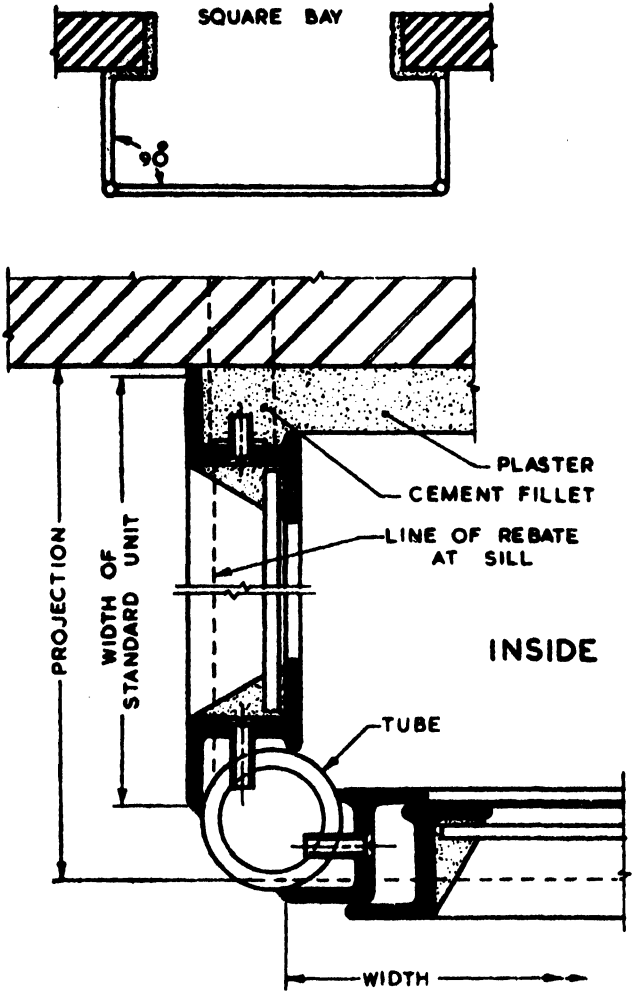


FIG. 11 FORMING OF COMPOSITE DOORS, WINDOWS AND VENTILATORS



12A SQUARE BAY

FIG. 12 METHOD OF FIXING STEEL WINDOWS IN DIFFERENT TYPES OF BAYS

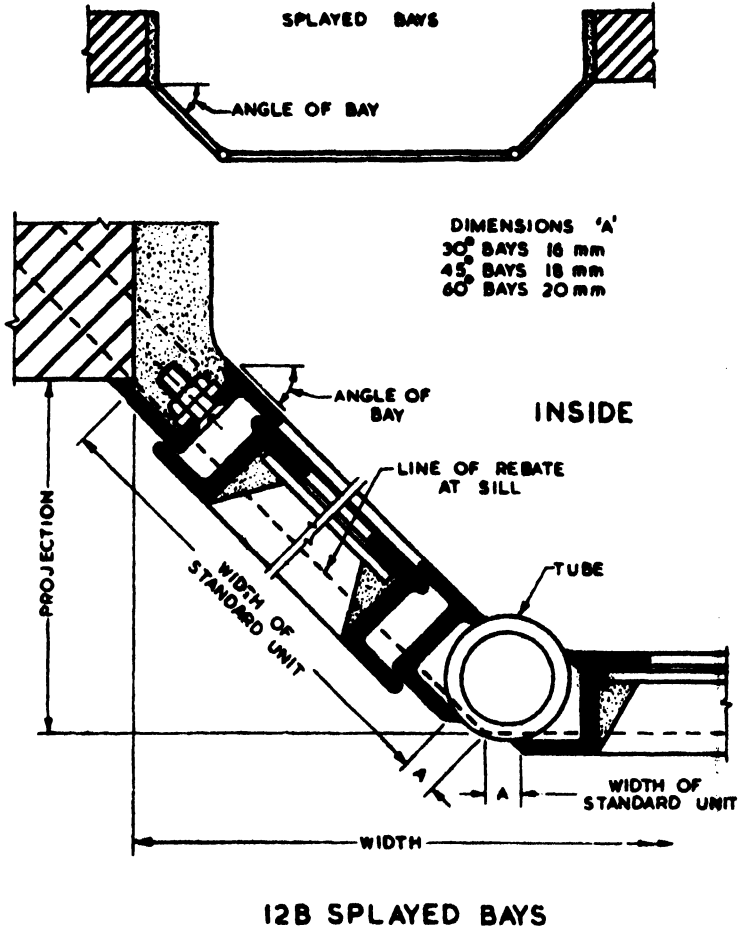
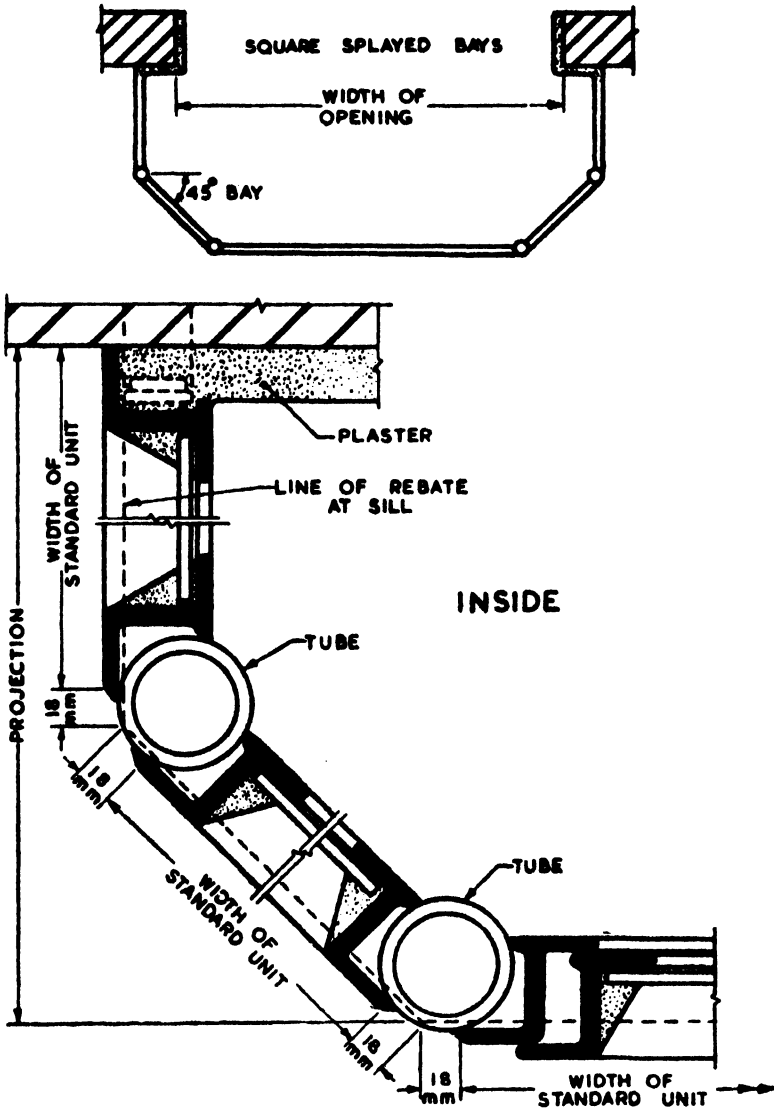
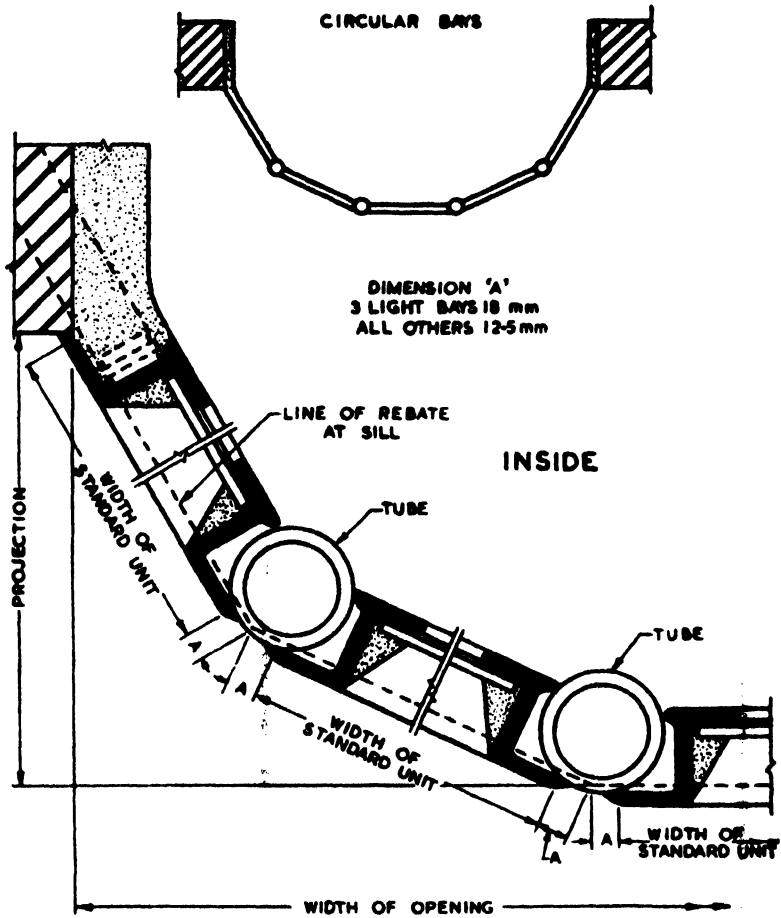


FIG. 12 METHOD OF FIXING STEEL WINDOWS IN DIFFERENT TYPES OF BAYS



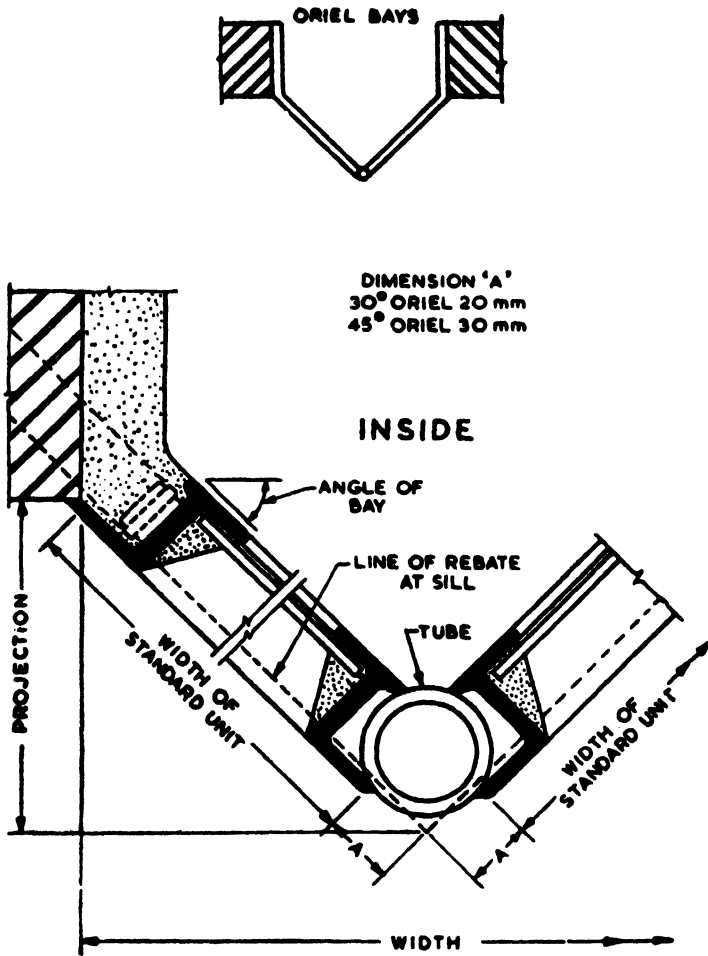
12C SQUARE SPLAYED BAYS (45° ONLY)

FIG. 12 METHOD OF FIXING STEEL WINDOWS IN DIFFERENT TYPES OF BAYS



12D CIRCULAR BAYS

FIG. 12 METHOD OF FIXING STEEL WINDOWS IN DIFFERENT TYPES OF BAYS



12E ORIEL BAYS

FIG. 12 METHOD OF FIXING STEEL WINDOWS IN DIFFERENT TYPES OF BAYS

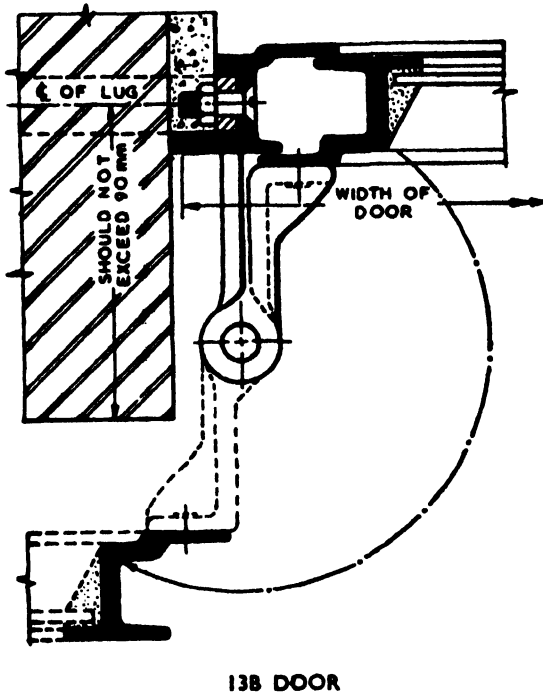
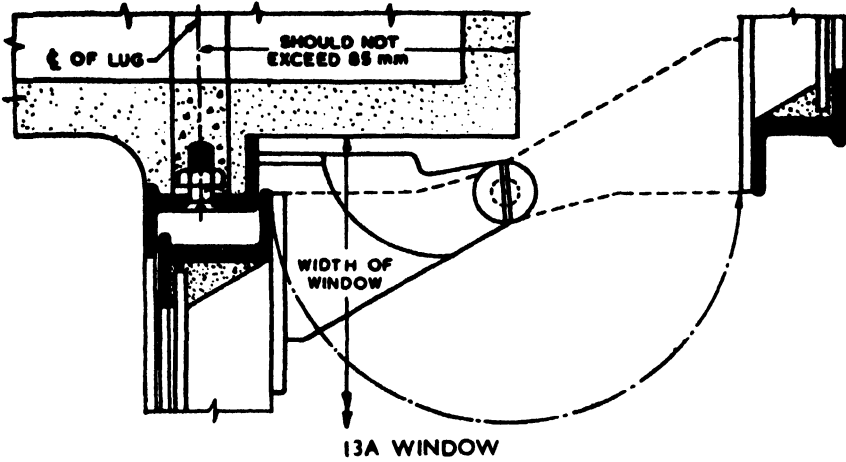


FIG. 13 REVEAL FOR EXTENDED HINGE

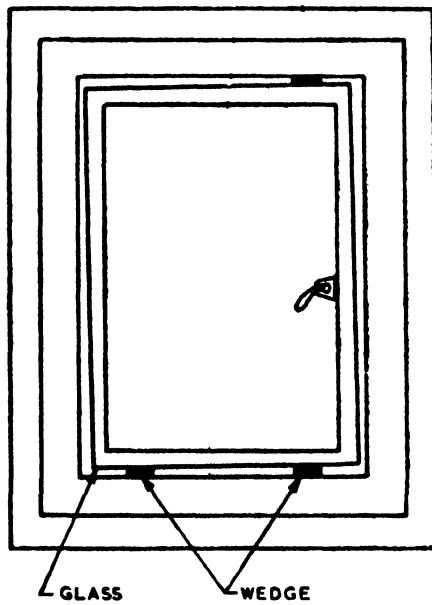


FIG. 14 POSITION OF GLASS IN SIDE HUNG CASEMENT

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