

Lintels with chajja

Objectives : At the end of this lesson you shall be able to,

- define lintel
- explain bearing of lintel
- list out the materials used lintel
- classify the lintel according to material of construction.

Introduction

A lintel can be a load bearing building component placed over an opening. The function of lintel is just the same as that of an arch or a beam. However the lintels are easy and simple in construction. Lintels are made from various materials. The lintels of RCC are widely used to span the openings for doors, windows etc. in a structure.

Definition

A Lintel is a structural horizontal member which is placed across an opening to support the portion of the structure above it.

Bearing of lintel

Bearing of lintel means the distance up to which it is inserted in the supporting wall. Bearing should be the minimum of the following three considerations.

- 1 150 mm or
- 2 The height of lintel or
- 3 $1/10$ th to $1/12$ th span.

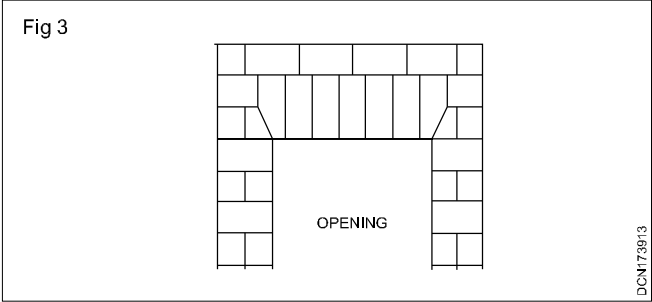
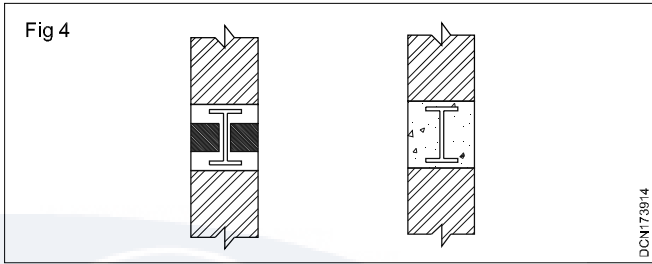
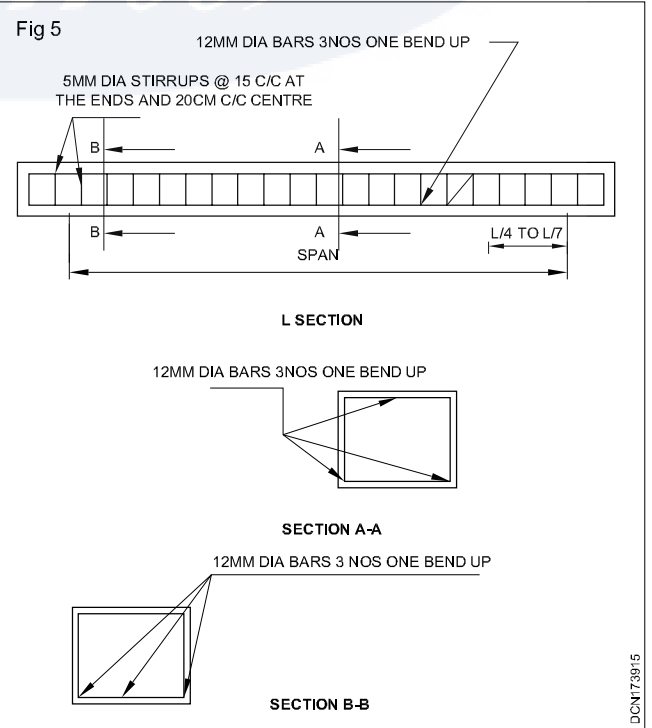
Materials for lintels

The common materials used in the construction of the lintel are as follows.

- 1 Wood or timber
- 2 Stone
- 3 Brick
- 4 Steel
- 5 Reinforced cement concrete

Classification of lintels according to the material used

Name	Features	Figure
1 Wood or timber lintel.	<p>A single piece of timber or built up sections of wood can be used as a lintel.</p> <ul style="list-style-type: none"> • A bearing of about 15 cm to 20 cm should be provided. • The width of lintel should be equal to the opening • The depth of lintel should be about $1/12$ to $1/8$ of the span with a minimum value of 80 mm. 	<p>Fig 1</p> <p>WOODEN LINTEL</p> <p>OPENING</p> <p>SECTION AA</p> <p>DCN173911</p>
2 Stone lintel	<p>These lintels consists of slabs of stones which it placed across the openings.</p> <p>Disadvantages of stone lintels</p> <ul style="list-style-type: none"> • Stone posses low tensile resistance. • It is difficult to obtain a good stone of required depth. 	<p>Fig 2</p> <p>STONE LINTEL</p> <p>OPENING</p> <p>DCN173912</p>

Name	Features	Figure
3 Brick lintels	<p>Brick lintels consist of bricks which are generally placed on edge.</p> <ul style="list-style-type: none"> bricks should be well burnt, copper coloured free from cracks and with sharp and square edges. this lintel have a depth equal to some multiple of brick courses. Suitable up to a span of one metre and for greater spans reinforcement or steel angle may be provided. 	<p>Fig 3</p>  <p>DCN173913</p>
4 Steel lintels	<ul style="list-style-type: none"> steel lintels consist of steel angles or rolled steel joists. Steel angles are used for small spans and light loading. Rolled steel joists are used for large spans and heavy loading. Tube separator-may be provided to keep the joists in position. R.S.J - The joists are embedded in concrete to protect steel from corrosion and fire. 	<p>Fig 4</p>  <p>DCN173914</p>
5 Reinforced cement concrete	<p>These lintels consists of reinforced cement concrete. The usual mix for concrete R.C.C lintel is 1:2:4 lintels Properties of R.C.C lintels.</p> <ul style="list-style-type: none"> fire proof durable strong economical easy to construct no relieving arches are necessary. <p>The reinforcement provided depends on</p> <ol style="list-style-type: none"> span of lintel width of opening total load to be supported <p>a. Precast RCC</p> <ul style="list-style-type: none"> Economical, Increase speed of construction Allow sufficient time for curing before fixing. 	<p>Fig 5</p>  <p>DCN173915</p>

Name	Features	Figure
<p>b. Cast in situ RCC Lintel</p> <p>6 Reinforced Brick lintel</p>	<ul style="list-style-type: none"> Centering is prepared reinforcement is placed and concreting is done. <p>Brick lintel strengthened by the provision of mild steel. In this use first class bricks with high compressive strength.</p> <p>Dense cement mortar is used to embed the reinforcement.</p> <p>It is adopted or used in the following circumstances.</p> <ul style="list-style-type: none"> Brickwork has to bear tensile and shear stress To increase the longitudinal bond Brickwork supported on large settlement soil. Brickwork is supported to act as a beam or lintel over opening When brickwork is to resist lateral loads as in retaining walls To carry heavy compressive load In seismic areas 	<p>Fig 6</p> <p>REINFORCED BRICK LINTEL</p> <p>DCN173916</p>
<p>7 R.C.C. lintel with chajja or canopy</p>	<ul style="list-style-type: none"> The number of main bars depends upon the load to be carried from the wall above and span of opening. The diameter of the bar varies with the span and is adopted as follow 6 mm ϕ bar span upto 1 m 8 mm ϕ bar span 1 to 1.5m 10 mm ϕ bar span 1.5 to 2 m 12 mm ϕ bar span 2 to 3 m The details of chajja projection or canopy is shown in Fig. 7 	<p>Fig 7</p> <p>SECTION</p> <p>R.C.C. LINTEL WITH CHAJJCH (OR) SUNSHADE</p> <p>DCN173917</p>

