
STAIRCASE

CONTENTS

- Introduction
- Technical Terms
- Requirements of good Staircase
- Dimensions of step
- Types of steps
- Classification of Staircase

INTRODUCTION

- Stairs is a set of steps which give access from floor to floor.
- The room or enclosure of the building, in which stair is located is known as staircase.
- Staircase provide access & communication between floors in multi-storey buildings and are a path by which fire can spread from one floor to another.
- Therefore it must be enclosed by fire resisting walls, floors, ceilings and doors.
- It must be designed to carry certain loads, which are similar to those used for design of the floors.
- Stairs may be constructed of Timber, Bricks, Stone, Steel or Reinforced Cement Concrete.

TECHNICAL TERMS

- **STEP:-** It is a portion of stair which permits ascent or descent. A stair is composed of a set of steps.
- **TREAD:-** It is a upper horizontal portion of a step upon which foot is placed while ascending or descending.
- **RISER:-** It is a vertical portion of a step providing support to the tread.
- **LANDING:-** It is level platform at the top or bottom of a flight between the floors.
- **FLIGHT:-** This is an unbroken series of steps between landing.

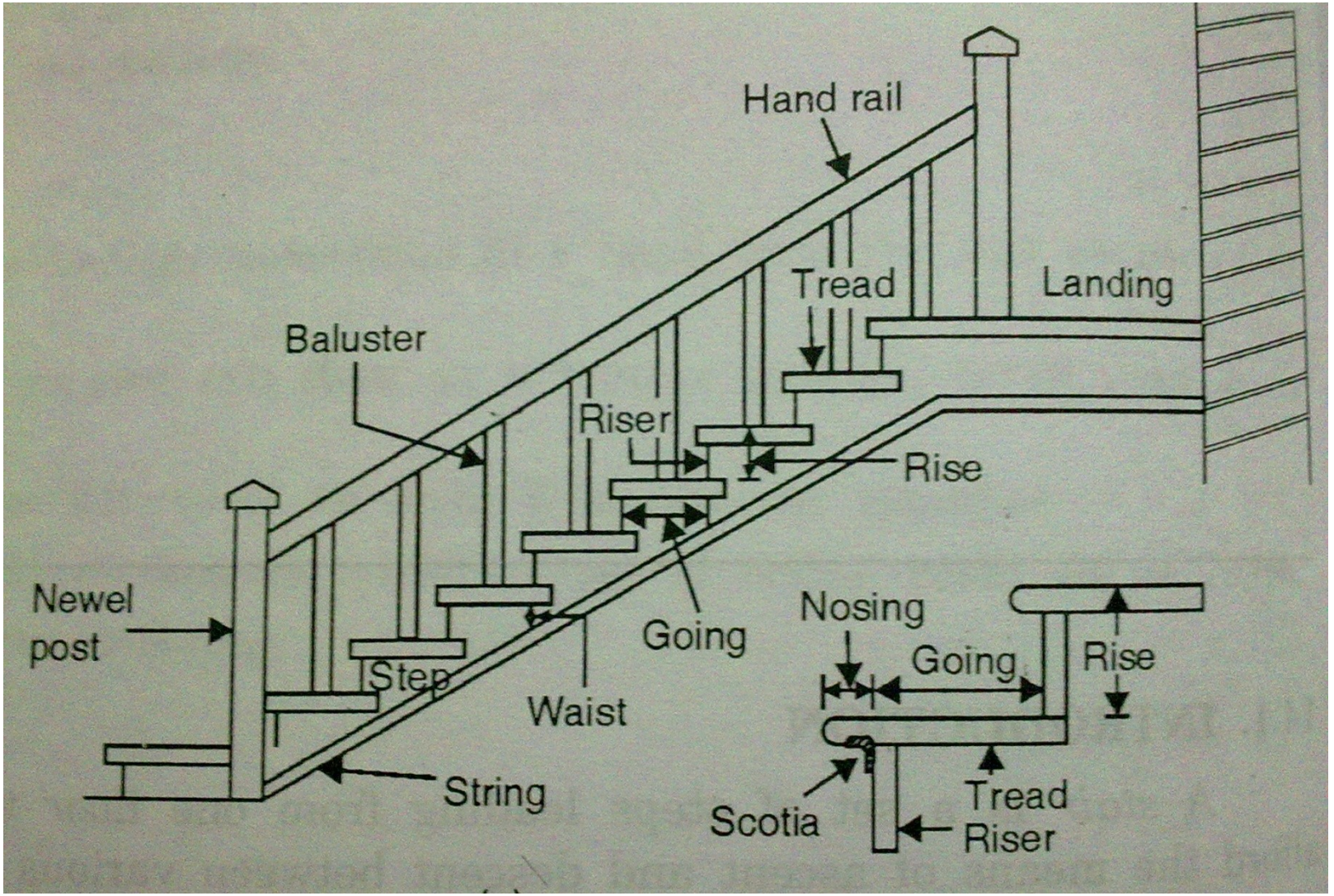
TECHNICAL TERMS

- **RISE:-** It is a vertical distance between two successive tread faces.
- **GOING:-** It is a horizontal distance between two successive riser faces.
- **NOSING:-** It is the projecting part of the tread beyond the face of riser.
- **SCOTIA:-** It is a moulding provided under the nosing to provide strength to nosing.
- **SOFFIT:-** it is the underside of a stair.
- **PITCH OR SLOPE:-** It is the angle which the line of nosing of the stair makes with the horizontal.

TECHNICAL TERMS

- **STRINGS OR STRINGERS:-** These are the slopping members which support the steps in a stair.
- **NEWEL POST:-** Newel post is a vertical member which is placed at the ends of flight to connects the ends of strings and hand rail.
- **BALUSTER:-** It is vertical member of wood or metal, supporting the hand rail.
- **HEAD ROOM:-** It is the clear vertical distance between the tread and overload structure.

TECHNICAL TERMS



REQUIREMENTS OF GOOD STAIRCASE

LOCATION

(a) They should be located near the main entrance to the building.

(b) There should be easy access from all the rooms without disturbing the privacy of the rooms.

(c) There should be spacious approach.

(d) Good light and ventilation should be available.

REQUIREMENTS OF GOOD STAIRCASE

WIDTH OF STAIR

(a) It should be wide enough to carry the user without much crowd on inconvenience.

(b) In Residential building, a 90 cm wide stair is sufficient while in public 1.5 to 1.8 m width may required.

LENGTH OF FLIGHT

(a) The number of steps should not be more than 12 & less than 3 from comfort point of view.

REQUIREMENTS OF GOOD STAIRCASE

PITCH OF STAIR

(a) Pitch should be limited to 30^0 to 45^0.

HEAD ROOM

(a) Height of head room should not be less than 2.1 to 2.3 m.

BALUSTRADE

(a) Stair should always provided with balustrade.

REQUIREMENTS OF GOOD STAIRCASE

STEP DIMENSION

(a) The rise and going should be of such dimensions as to provide comfort to users.

(b) The going should not be less than 25 cm, though 30 cm going is quite comfortable.

(c) The rise should be between 10 to 15 cm.

(d) The width of landing should not be less than width of stair.

MATERIAL OF CONSTRUCTION

(a) The material should have fire resistance and sufficient strong.

THUMB RULES FOR DIMENSIONS OF STEP

(a) (2 X Rise in cm) + (Going in cm) = 60

(b) (Rise in cm) + (Going in cm) = 40 to 45

(c) (Rise in cm) X (Going in cm) = 400 to 450

TYPES OF STEPS

(a) Flier
(b) Bull Nose
(c) Round Ended
(d) Splayed
(e) Commode
(f) Dancing
(g) Winders

CLASSIFICATION OF STAIRCASE

- Straight Staircase
- Turning Staircase

(a) Quarter Turn

(b) Half Turn (Dog-Legged & Open well Staircase)

(c) Three-Quarter Turn Staircase

(d) Bifurcated Staircase

- Continuous Staircase

(a) Circular Staircase

(b) Spiral Staircase

(c) Helical Staircase

STRAIGHT STAIRCASE

- If the space available for stair case is narrow and long, straight stairs may be provided.
- Such stairs are commonly used to give access to porch or as emergency exits to cinema halls.
- In this type all steps are in one direction.
- They may be provided in single flight or in two flights with landing between the two flights

STRAIGHT STAIRCASE

QUARTER TURN STAIRCASE

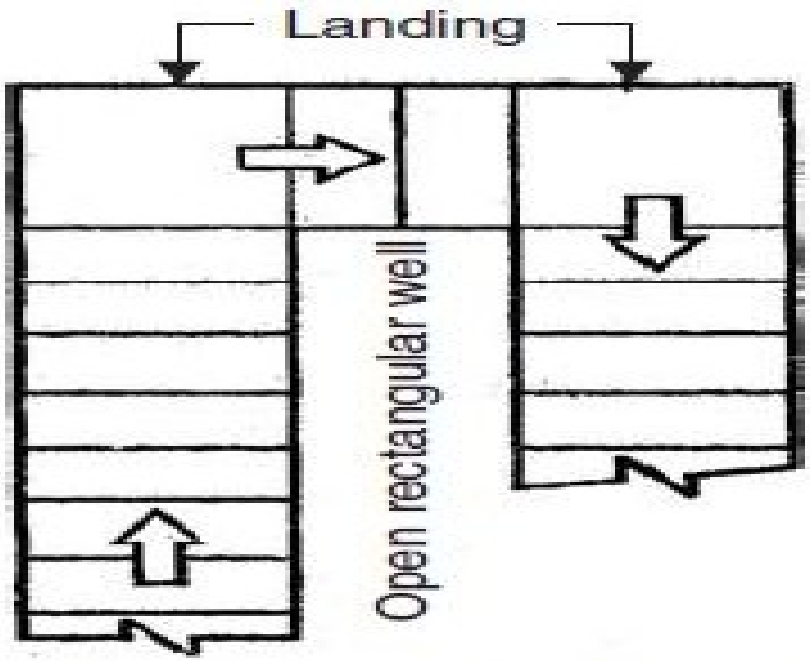
DOG-LEGGED STAIRCASE

- It consists of two straight flights with 180° turn between the two.
- They are very commonly used to give access from floor to floor.
- Photograph shows the arrangement of steps in such stairs.

DOG-LEGGED STAIRCASE

OPEN WELL OR NEWEL STAIRCASE

- It differs from dog legged stairs such that in this case there is 0.15 m to 1.0 m gap between the two adjacent flights.

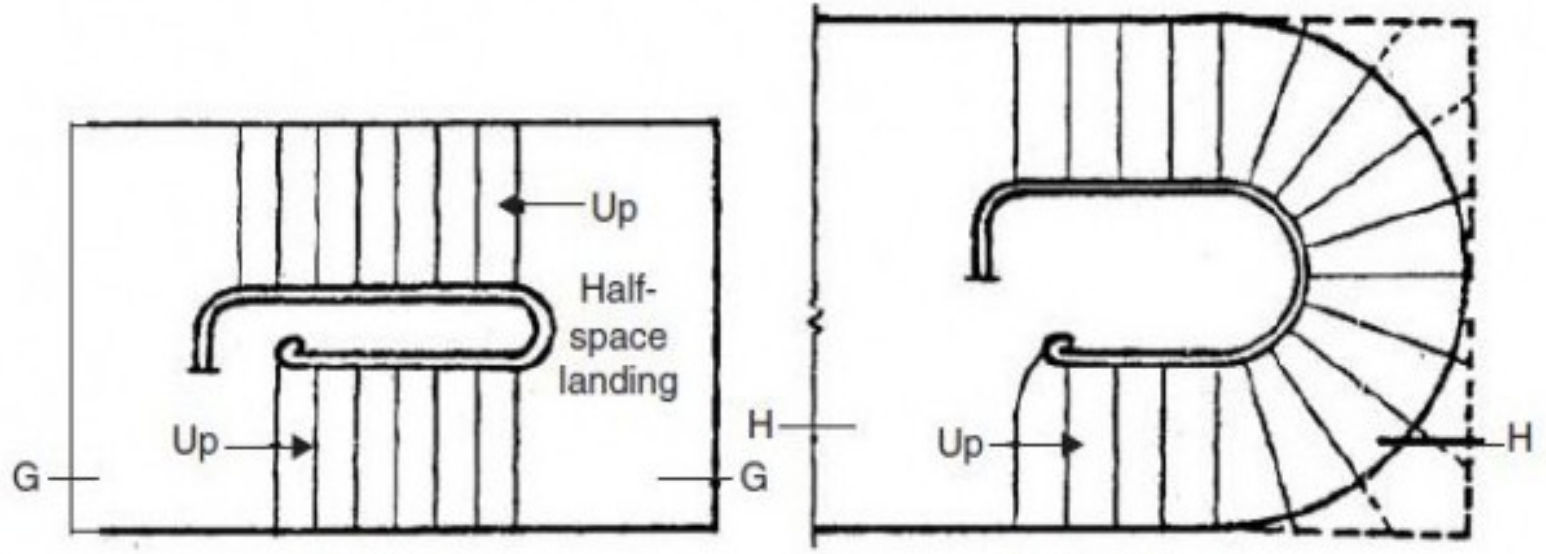


Open well (newel) stair

OPEN WELL OR NEWEL STAIRCASE

GEOMETRICAL STAIRCASE

- This type of stair is similar to the open newel stair except that well formed between the two adjacent flights is curved.
- The hand rail provided is continuous.



Geometric stairs

GEOMETRICAL STAIRCASE

BIFURCATED STAIRCASE

- Apart from dog legged and open newel type turns, stairs may turn in various forms.
- They depend upon the available space for stairs. Quarter turned, half turned with few steps in between and bifurcated stairs are some of such turned stairs.
- Figure shows a bifurcated stair.

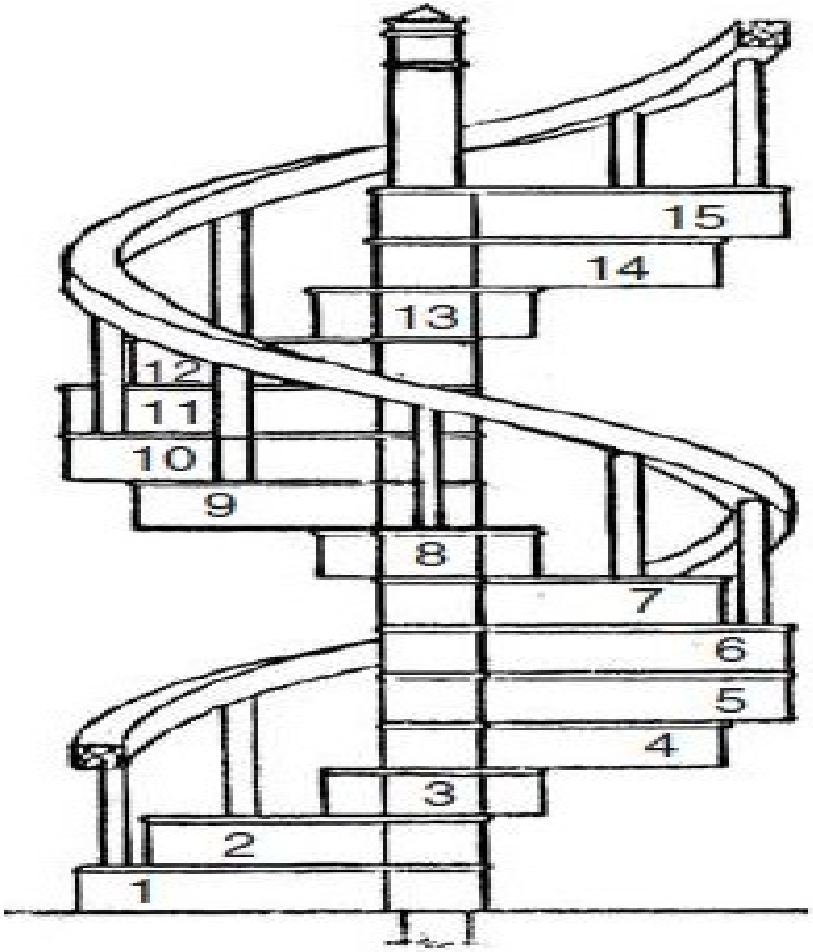
BIFURCATED STAIRCASE

BIFURCATED STAIRCASE

SPIRAL STAIRCASE

- These stairs are commonly used as emergency exits.
- It consists of a central post supporting a series of steps arranged in the form of a spiral.
- At the end of steps continuous hand rail is provided.
- Such stairs are provided where space available for stairs is very much limited.
- Figure shows a typical spiral stair. Cast iron, steel or R.C.C. is used for building these stairs.

SPIRAL STAIRCASE



Spiral stairs

SPIRAL STAIRCASE

MATERIALS USED IN CONSTRUCTION OF STAIRCASE

- Timber
- Metal
- R.C.C.
- Stone
- Glass

TIMBER STAIRCASE

METAL STAIRCASE

R.C.C. STAIRCASE

STONE STAIRCASE

GLASS STAIRCASE

Thank You !!!