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சென்னை

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தமிழ்நாடு பொதுப்பணித்துறை பொறியாளர்கள் சங்கம்

TAMIL NADU PUBLIC WORKS DEPARTMENT ENGINEERS ASSOCIATION



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சென்னை, தண்டையார்பேட்டை, காமராஜர் நகரில் ரூ.39.30 கோடியில் நவீன வசதிகளுடன் கூடிய 96 குடியிருப்புகளுடன் கட்டப்பட்டுள்ள தமிழ்நாடு அரசு அச்சகப் பணியாளர் குடியிருப்பினை திறந்து வைத்து, பணியாளர்களுக்கு குடியிருப்பினை மாண்புமிகு தமிழ்நாடு முதலமைச்சர் திரு. மு.க. ஸ்டாலின் அவர்களால் திறந்து வைக்கப்பட்டது.

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TAMIL NADU PUBLIC WORKS DEPARTMENT ENGINEERS ASSOCIATION

(Registered under the Societies Registration Act, 1975)

(Regn. No.: SRG / Chennai Central/ 305/ 2024)

▼ PWD Campus, Chepauk, Chennai-600005



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TAMIL NADU PUBLIC WORKS DEPARTMENT ENGINEERS ASSOCIATION

Dear Members of the Tamil Nadu Public Works Department Engineers Association,

Tamil Nadu Public Works Department Engineers' Association extends a warm and cordial welcome to all the newly appointed engineers and members who have joined our esteemed Department and the Association.

You are joining a Department with a distinguished legacy of engineering excellence and dedicated public service. The Public Works Department has played a vital role in shaping the infrastructure of our State, and your contributions as engineers will be instrumental in carrying forward this proud tradition.

We encourage all new members to actively participate in the Association's activities, meetings, technical programmes, and welfare initiatives. Your active involvement will not only strengthen the Association but also contribute significantly to your personal and professional development.

We look forward to your enthusiastic participation and valuable contributions. Together, let us work with dedication, integrity, and unity to uphold the dignity of the Public Works Department and to serve the people of Tamil Nadu with commitment and excellence.

Once again, we welcome you and wish you a successful, rewarding, and fulfilling career.

**Best Regards,
Er. E.Emmanuel Jaikar B.E., M.B.A., F.I.E.,
Secretary**

Tamil Nadu Public Works Department Engineers Association

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புதுடெல்லி சாணக்யபுரி தமிழ்நாடு இல்ல வளாகத்தில், புதியதாக கட்டப்பட்ட வரும் வைகை இல்ல கட்டுமானப் பணிகள் மற்றும் செங்கல்பட்டு மாவட்டம் முட்டுக்காடு பகுதியில் உருவாகி வரும் "கலைஞர் சர்வதேச பன்னோக்கு அரங்கம்" முன்னேற்றம் குறித்து மாண்புமிகு தமிழ்நாடு பொதுப்பணிகள், நெடுஞ்சாலைகள் மற்றும் சிறு துறைமுகங்கள் துறை அமைச்சர் திரு.எ.வ.வேலு அவர்கள் ஆய்வு செய்தார்.



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செங்கல்பட்டு மாவட்டம் முட்டுக்காடு பகுதியில் உருவாகி வரும் கலைஞர் சர்வதேச பன்னோக்கு அரங்கம் கட்டுமானப் பணிகள்

Office of the Engineer -In- Chief (Buildings), PWD , Chepauk, Chennai -5
Circular Memo. No. : AEE / T10/ 24475 /2018, Dated : 13.06.2018

The Circular includes :

- 1. Templates for Passenger Lifts (8, 10, 13, 16 and 20 persons capacity)**
- 2. Recommended dimensions of Passenger Lifts, Goods Lifts and Hospital Lifts as per IS 14665 (Part-I): 2000**
- 3. High Tension Sub-Room Design Details – I & II**
- 4. Generator Bed Details**



**PUBLIC WORKS DEPARTMENT
BUILDINGS**

**OFFICE OF THE ENGINEER-IN-CHIEF (BUILDINGS) AND
CHIEF ENGINEER (BUILDINGS) CHENNAI REGION, PWD.,
CHEPAUK, CHENNAI-5**

Circular Memo No. AEE / T10 / 24475 / 2018, dated 13.06.2018

Sub: Buildings – Standardisation of dimension of Lift (Shaft, Door, Pit Depth), Generator Room and High Tension Room, etc. – Guidelines – Issued – Regarding.

In order to standardise the dimensions of the Lift (Shaft, Door, Pit Depth), Generator Room and High Tension Room, etc., the template drawings are enclosed herewith.

1. Templates for Passenger Lifts (8, 10, 13, 16 and 20 Persons Capacity).
2. Recommended dimensions of Passenger Lift, Goods Lifts, Hospital Lifts as per IS-14465 (Part-I): 2000).
3. High Tension Supply Room Design Details-I and II.
4. Generator Bed Details.

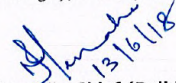
All the Engineers are instructed to strictly adhere to the above dimensions; in future without fail and also necessary provisions should be included in all the Civil estimates.

Sd/- (S. MANOHAR)
**Engineer-In-Chief (Buildings) and
Chief Engineer (Buildings) C.R., PWD.,**

To

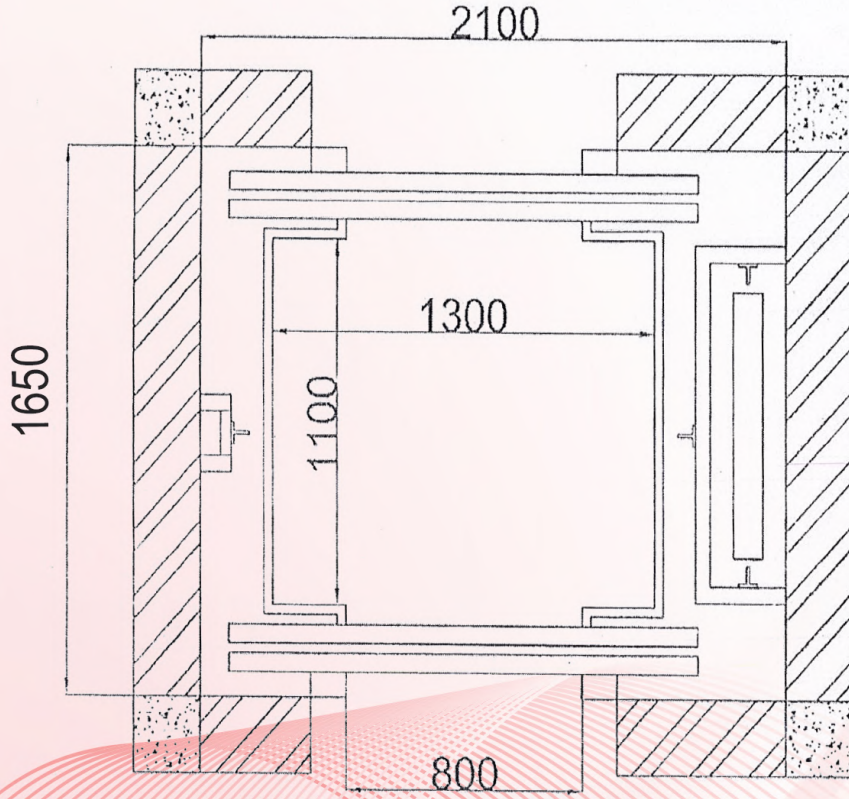
1. The Chief Engineer (Buildings), PWD., Trichy Region, Trichy
2. The Chief Engineer (Buildings), PWD., Madurai Region, Madurai.
3. The Chief Architect, PWD., Chepauk, Chennai-5.
4. The Joint Chief Engineer (Buildings), O/o. Engineer-in-Chief (Buildings), PWD., Chepauk, Chennai-5.
5. The Joint Chief Engineer (Electrical), O/o. Engineer-in-Chief (Buildings), PWD., Chepauk, Chennai-5.
6. All the Superintending Engineers of Building Organisation, PWD
7. All the Executive Engineers of Building Organisation, PWD
8. All the AEEs & HDO, O/o Engineer-in-Chief (Buildings), PWD., Chennai.

// Forwarded by order //


**For Engineer-In-Chief (Buildings) and
Chief Engineer (Buildings) C.R., PWD.,
Chepauk, Chennai-5**


Office of the Engineer -In- Chief (Buildings), PWD , Chepauk, Chennai -5
Circular Memo. No. : AEE / T10/ 24475 /2018, Dated : 13.06.2018

8 Passenger Lift



Lift Shaft Size

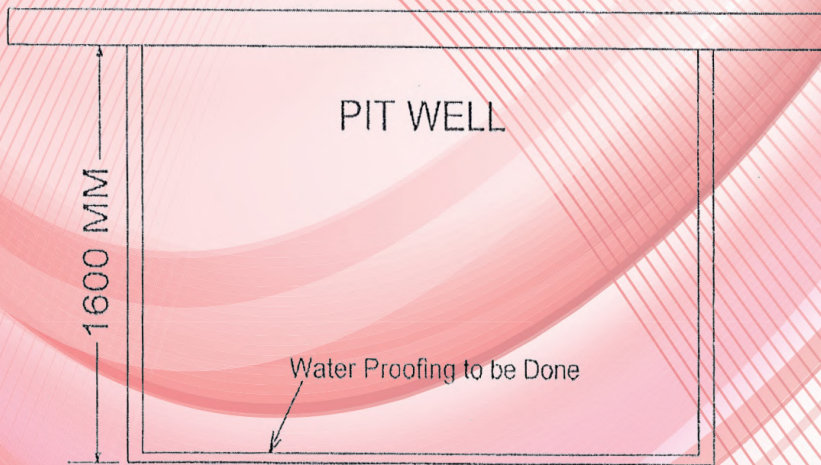
2100 x 1650

Car Size

1300 x 1100

Door Size

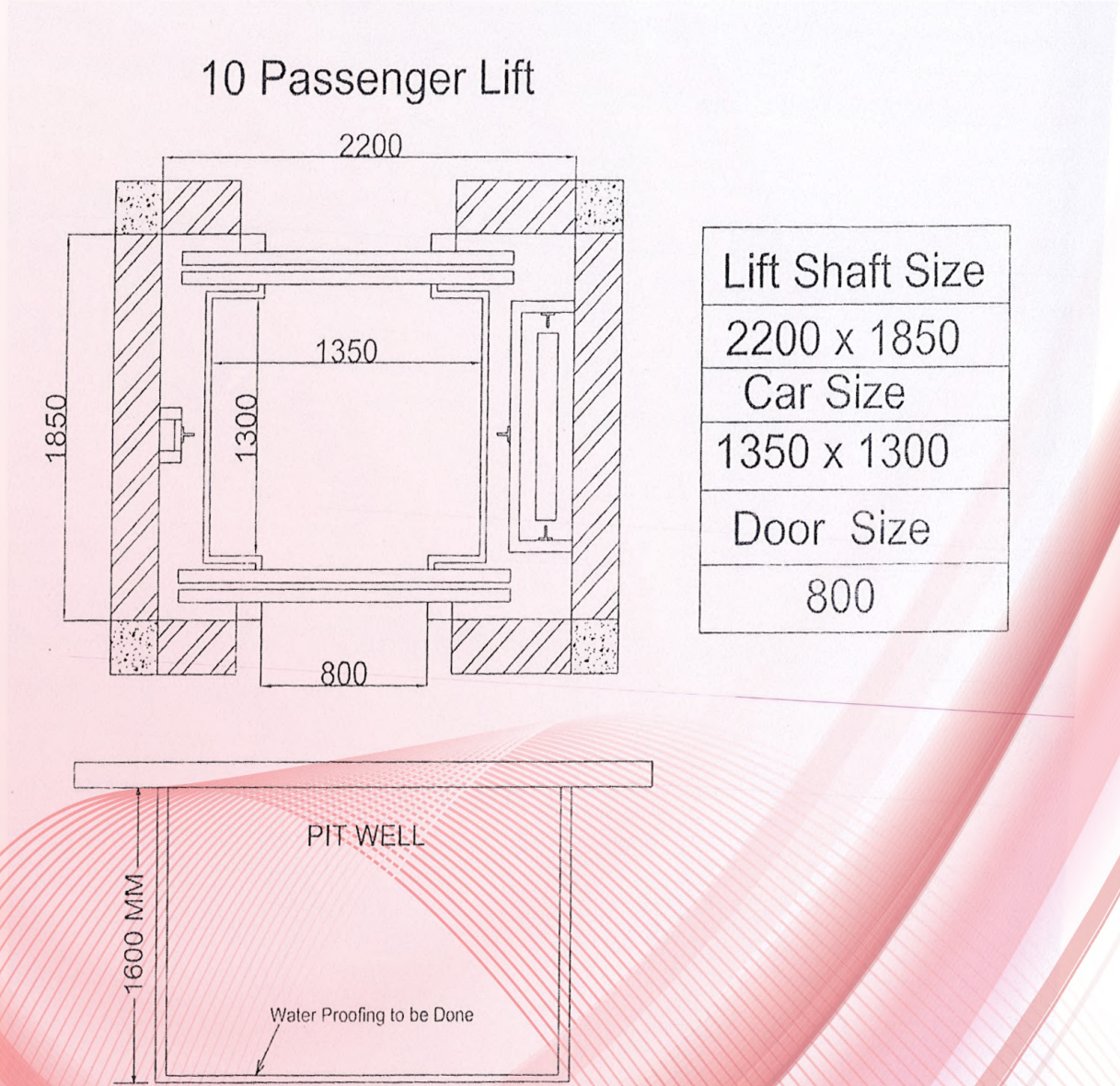
800



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Chief Engineer (Buildings) Chennai Region,
Public Works Department,
Chepauk, Chennai-600 005.

13/6/18

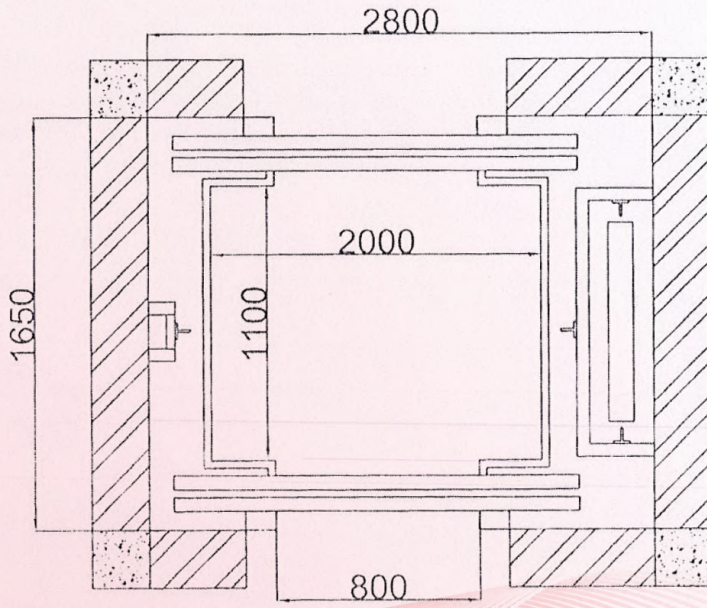
Office of the Engineer -In- Chief (Buildings), PWD , Chepauk, Chennai -5
Circular Memo. No. : AEE / T10/ 24475 /2018, Dated : 13.06.2018



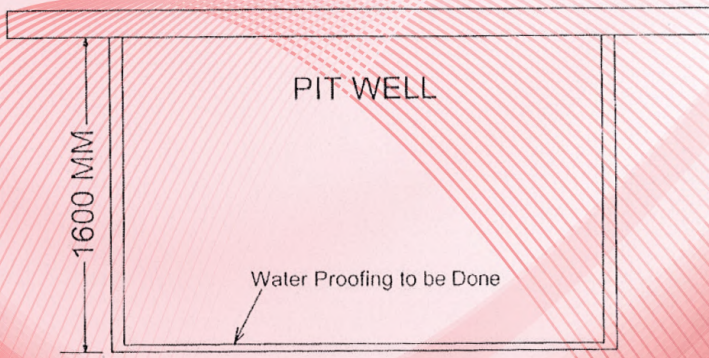
For
13/6/18
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Circular Memo. No. : AEE / T10/ 24475 /2018, Dated : 13.06.2018

13 Passenger Lift



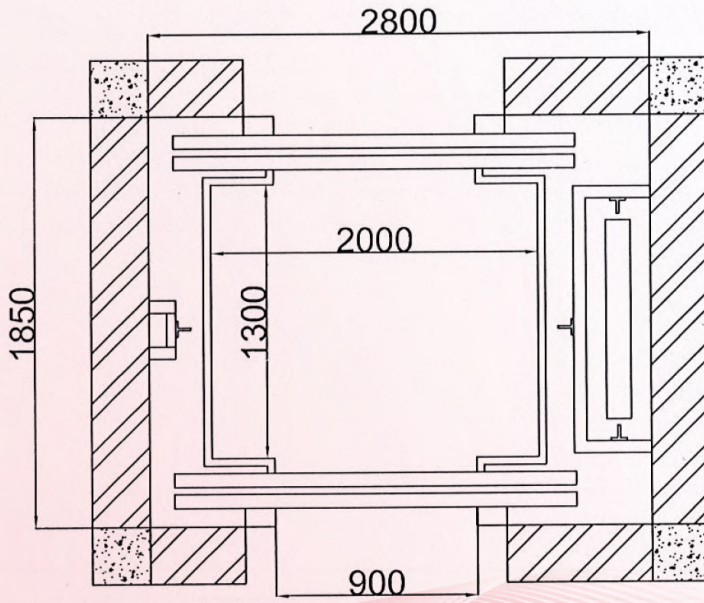
Lift Shaft Size
2800 x 1650
Car Size
2000 x 1100
Door Size
800



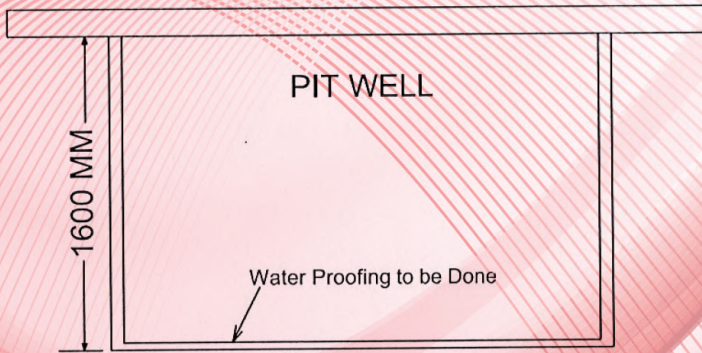
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16 Passenger Lift



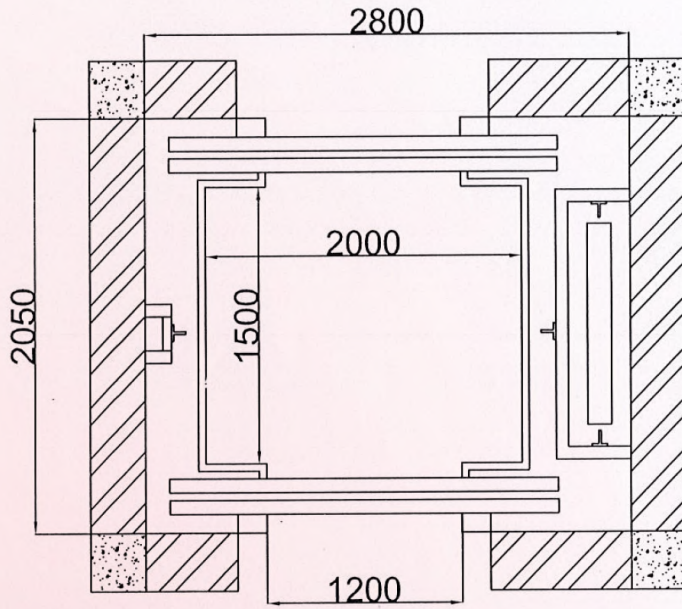
Lift Shaft Size
2800 x 1850
Car Size
2000 x 1300
Door Size
900



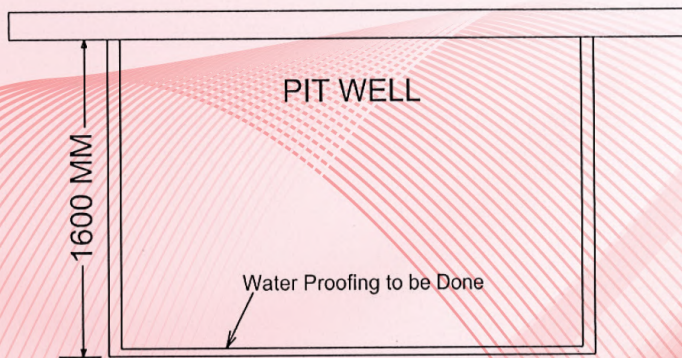
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20 Passenger Lift



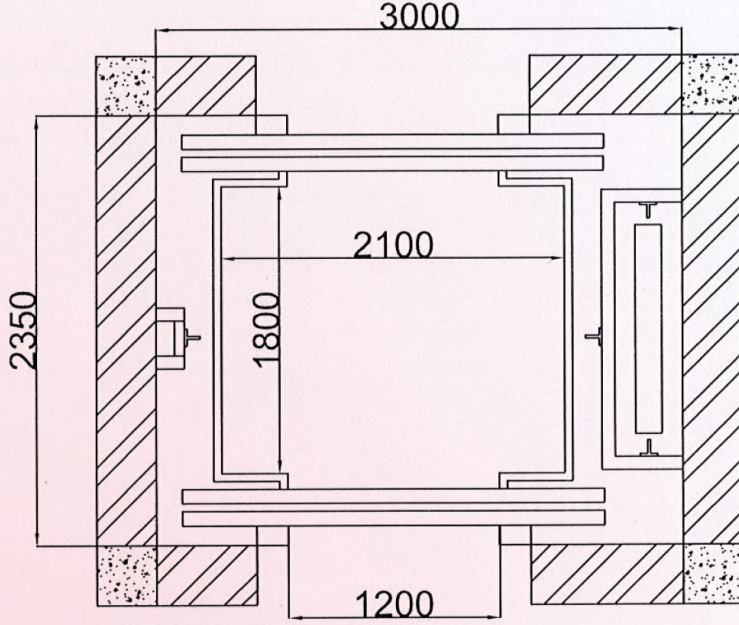
Lift Shaft Size
2800 x 2050
Car Size
2000 x 1500
Door Size
1200



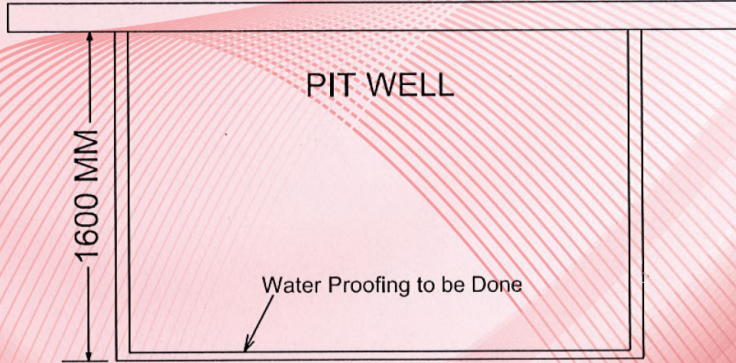
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26 Passenger Lift



Lift Shaft Size
3000 x 2350
Car Size
2100 x 1800
Door Size
1200



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13/6/18

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Circular Memo. No. : AEE / T10/ 24475 /2018, Dated : 13.06.2018

Lift Overall measurement Details

No.	Load Details		Lift Shaft Size in MM		Car Inner Size in MM		Opening Size in MM {Door}
	Persons	KGS	Length	Breadth	Length	Breadth	
1	8	544	2100	1650	1300	1100	800
2	10	680	2200	1850	1350	1300	800
3	13	884	2800	1650	2000	1000	800
4	16	1088	2800	1850	2000	1300	900
5	20	1360	2800	2050	2000	1500	1200
6	26	1768	3000	2350	2100	1800	1200

For Engineer-in-Chief (Buildings) &
Chief Engineer (Buildings) Chennai Region,
Public Works Department,
Chepauk, Chennai-600 005.
13/6/18

In the next edition of magazine, the circular will continue with
High Tension Sub-Room Design Details - Parts I & II and
Generator Bed Design Details.

STAIRCASE

Stair case, Components of stair case, Types of stair case - Limit state design of dog legged and open newel staircase.

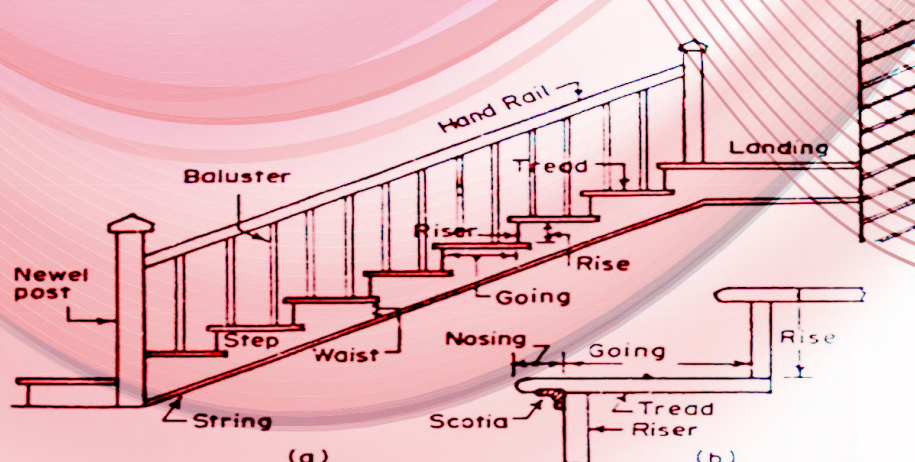
Introduction

Staircase is an important component of a building providing access to different floors and roof of the building. It consists of a flight of steps (stairs) and one or more intermediate landing slabs between the floor levels. Different types of staircases can be made by arranging stairs and landing slabs. Staircase, thus, is a structure enclosing a stair.

Technical Terms

The definitions of some technical terms, which are used in connection with design of stairs, are given.

- Tread or Going: horizontal upper portion of a step.
- Riser: vertical portion of a step.
- Rise: vertical distance between two consecutive treads.
- Flight: a series of steps provided between two landings.
- Landing: a horizontal slab provided between two flights.
- Waist: the least thickness of a stair slab.
- Winder: radiating or angular tapering steps.
- Soffit: the bottom surface of a stair slab.
- Nosing: the intersection of the tread and the riser.
- Headroom: the vertical distance from a line connecting the nosing of all treads and the soffit above.



STAIRCASE

Types of Staircase

The various types of staircase adopted in different types of buildings can be grouped under geometrical and structural classifications depending upon their shape and plan pattern and their structural behavior under loads.

Geometrical Classification

a) Straight stairs

- All steps lead in one direction.
- This may be continuous with two flights with an intermediate landing
- Adopted when staircase is narrow.

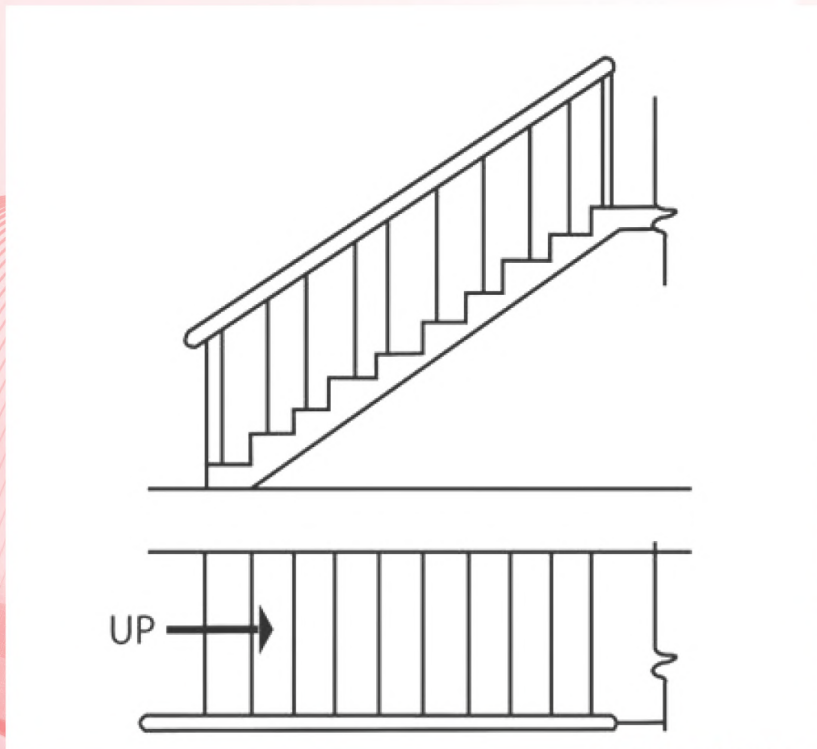


Fig.:1 Straight staircase

b) Dog-legged staircase

- Consist of two straight flights running in opposite direction

STAIRCASE

- There is no space between flights in plan
- Landing is provided at level which direction of flight changes.

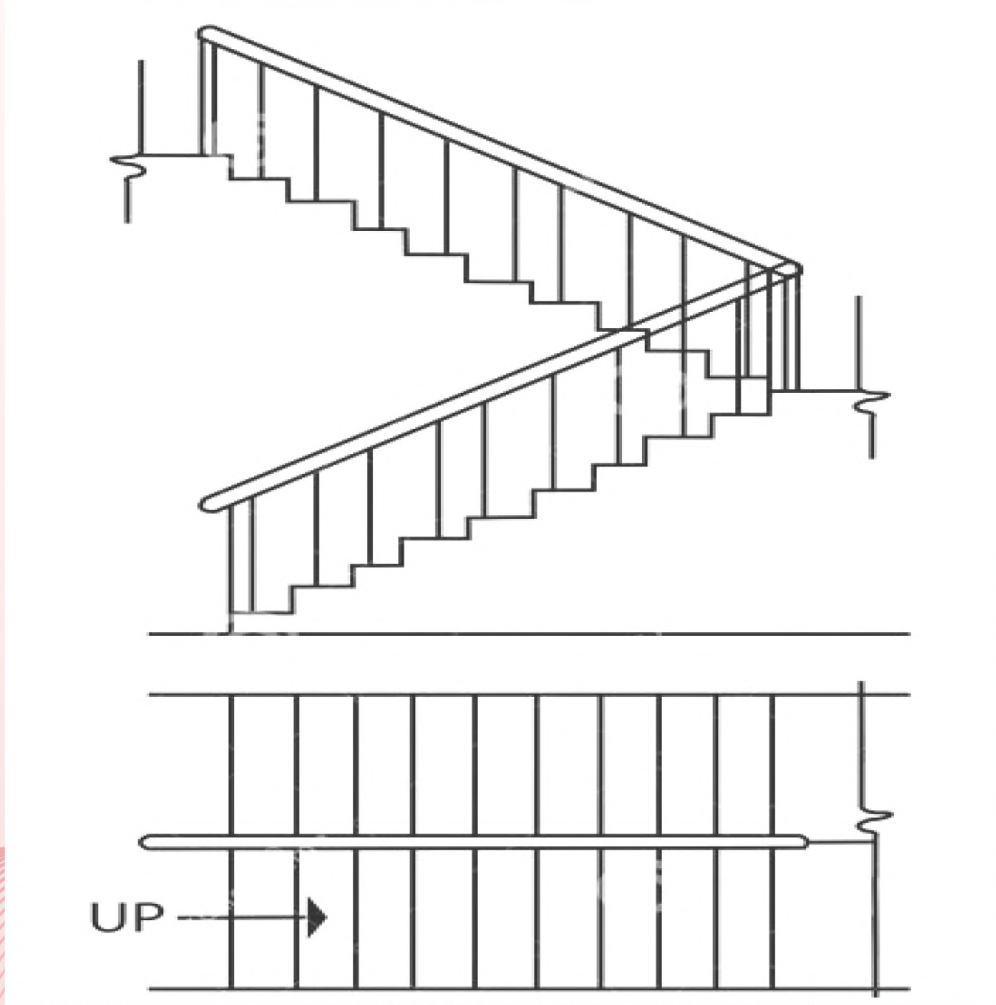


Fig.:2 Dog Legged staircase

c) Quarter turn Newel:

- A stair turning through 90° with the help of level landing
- Used in shops and public buildings

STAIRCASE

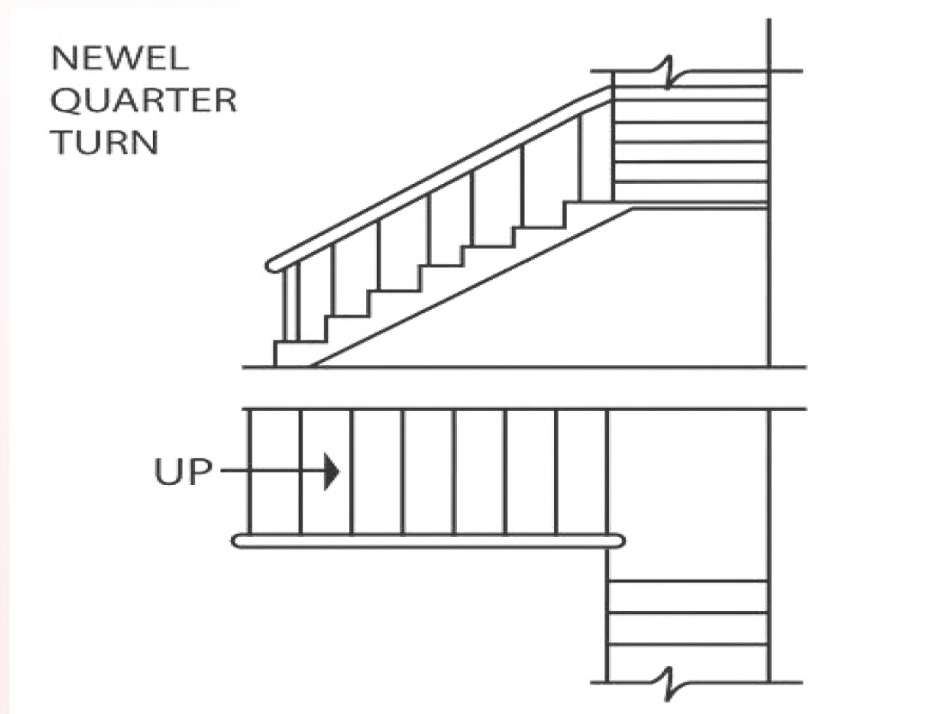


Fig.:3 Quarter turn Newel

d) Open Newel Stairs:

- Popularly known as open well stairs
- A well or opening is left between forward and backward flight

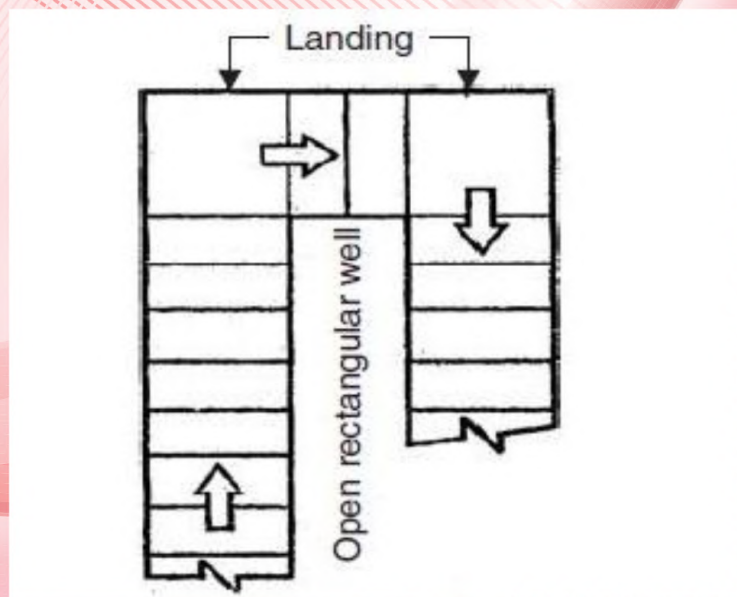


Fig.:4 Open Well or Newel

e) Circular stairs:

- All the steps radiate from new post or well hole

STAIRCASE

- Mostly located at rear of building

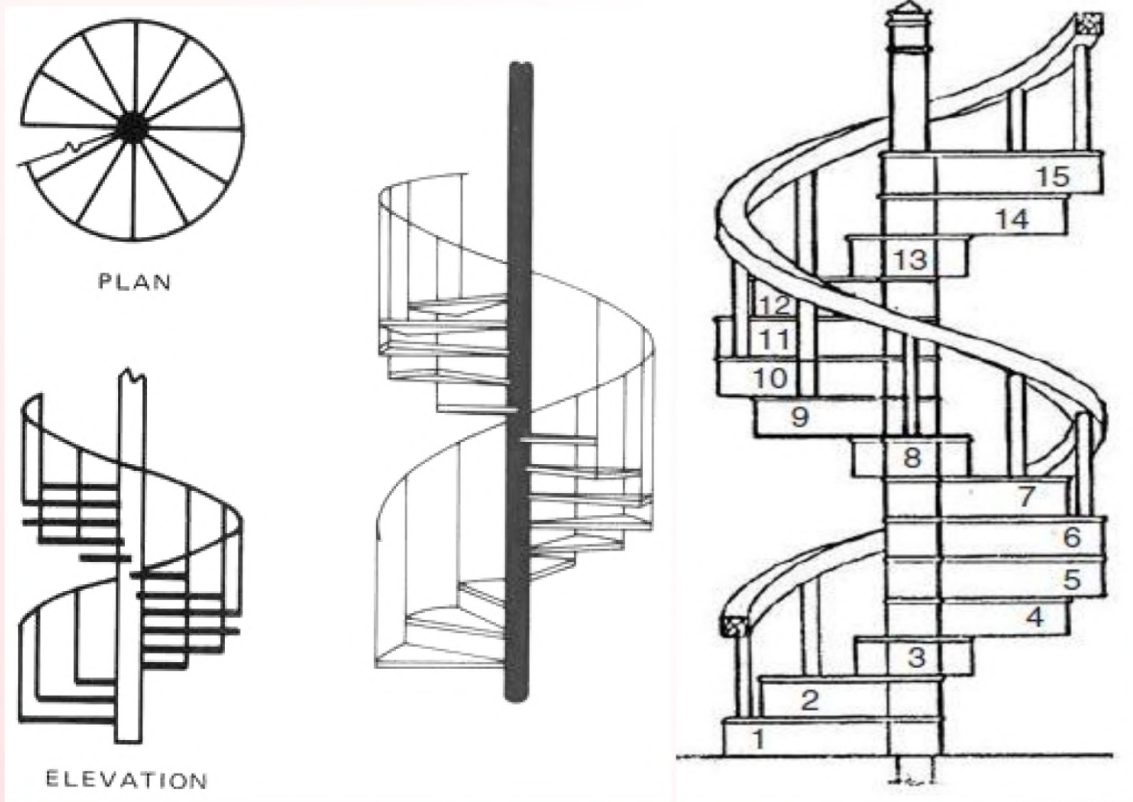


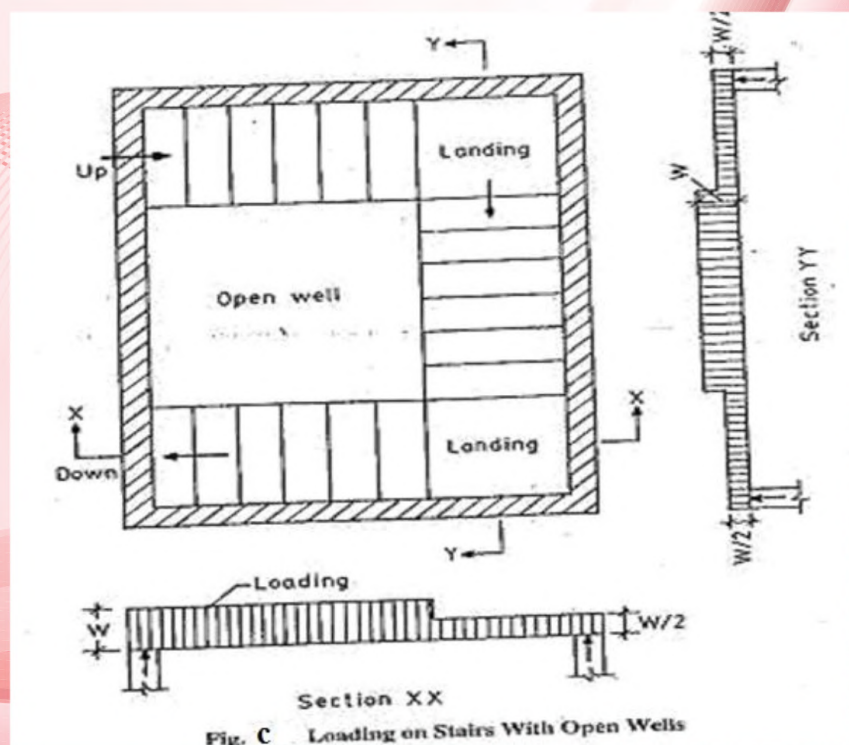
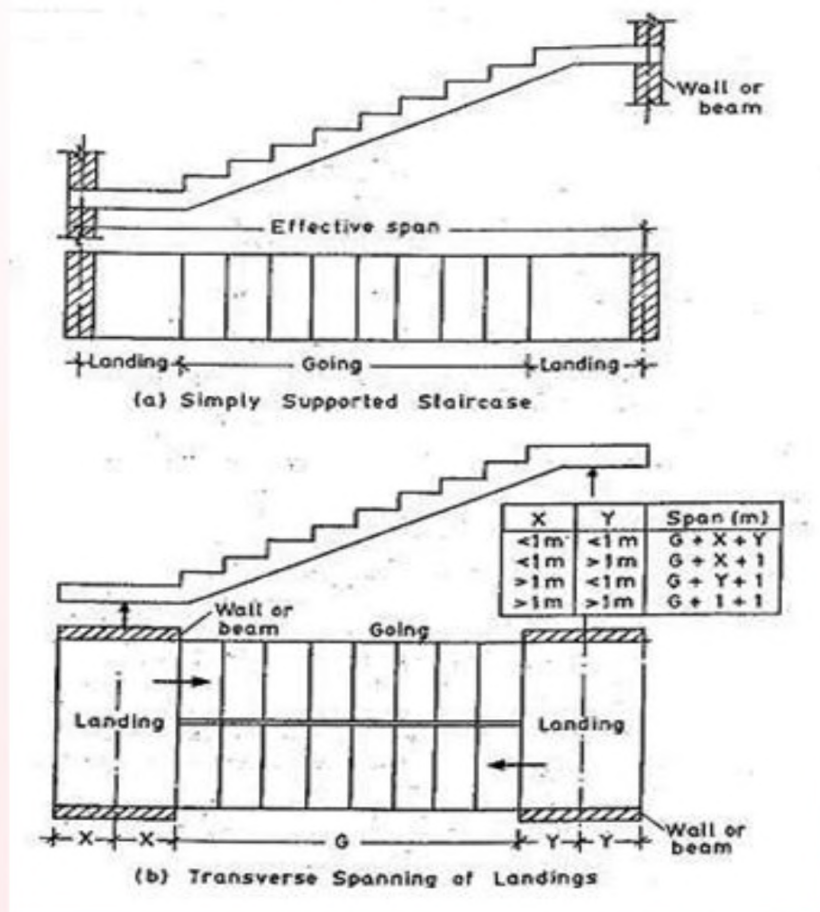
Fig.:5 Circular stairs

Structural behavior of staircases

a) Stairs Spanning in Longitudinal direction:

- Inclined stair flight together with landing are supported on wall and beams
- The effective span is considered between the centre to centre of supports as in figure a
- As in figure b, the transverse spanning of landings span is taken
- In case of open well stairs where span partly cross at right angles the load on common area may distributed as one half in each direction in figure c.

STAIRCASE

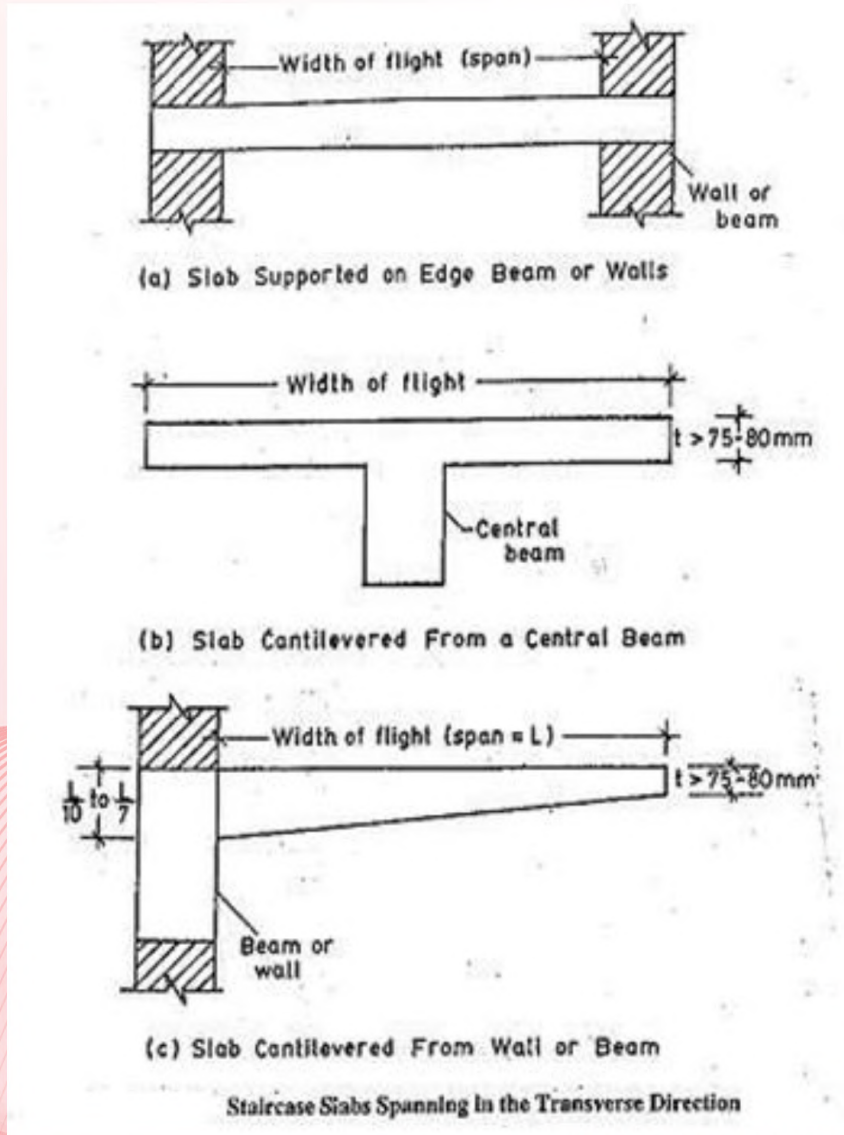


b) Stair slab spanning in the transverse direction:

- Following are the examples of slabs spanning in the transverse direction
- In these slabs width of flight being small (1-1.5m)

STAIRCASE

- Minimum thickness of 75 to 80mm should be provided.
- Minimum percentage reinforcement to resist maximum bending moment should be provided.



STAIRCASE

General Guidelines

The following are some of the general guidelines to be considered while planning a staircase:

Rise (R) : 150mm to 180mm

Tread (T) : 220 mm to 250 mm- for residential buildings.

Rise (R) : 120 to 150 mm

Tread (T) : 250 mm to 300 mm – for public buildings

[T + 2R] : Between 500 mm to 650 mm

The width of the stair

- 0.8 m to 1 m for residential building and
- 1.8 m to 2 m for public building.

DESIGN GUIDELINES

Geometrical Design

- ✓ Assume Suitable Tread and Riser
- ✓ No. of Riser $= (\text{F/F Height}) / \text{Rise}$
- ✓ No. of Risers in One Flight $= 0.5 * (\text{No. Of Risers})$
- ✓ No. of Tread $= (\text{No. of Risers} - 1)$
- ✓ Going distance $= (\text{No. of tread}) \times (\text{tread width})$
- ✓ Width of landing $\geq$ width of stair

In the next edition of the magazine, structural design of staircases will be continued.

COMMON DEFECTS/ PROBLEMS IN CONCRETE AND THEIR REMEDIES:

S.No.	Defect	Causes	Suggested solution
1.	Segregation & Bleeding	Mix is lean. Over vibration.	Use richer mix. Avoid over vibration
2.	Permeability & shrinkage.	High water content in the mix. Lack of compaction. Improper grading of aggregate.	Reduce water cement ratio. Resort to sufficient compaction. Use proper graded aggregate
3.	Blow holes on exposed faces.	Improper mix design. Inadequate cover between reinforcement and mould face which restrains local flow of concrete between mould face and reinforcement. Lack of sufficient vibration	Use correct water-cement ratio. Use agent to improve workability if water cement ratio is to be kept low. Use adequate cover for reinforcement. Resort to adequate mechanical vibration using vibrator head of larger circumference (It is to be noted that vibrator needle has no effect on the concrete below the tip of the needle). Resort to knifing at the contact face of mould. Resort to vigorous tamping with a wooden mallet on all sides of form work during the concreting process.
4.	Plastic cracks (small-near horizontal crack at faces)	During compaction higher particles tends to settle down and water rises up and collects below certain points of concrete, rising higher due to arching or interlocking. This causes cracks during drying below such points.	Use cohesive mix. Place and compact concrete in layer avoiding any local point of arching.
5.	Crazing (map or starry fine cracks on the surfaces upto 3 cm long)	Shrinkage of surface due to surface carbonation (caused due to free lime released during hydration reacting with CO ₂ which reduces resistance of the surface to drying shrinkage.)	Reduce water-cement ratio. Use pozzollana cement. Resort to membrane curing to keep the surface covered.

COMMON DEFECTS/ PROBLEMS IN CONCRETE AND THEIR REMEDIES:

S.No. Defect	Causes	Suggested solution
6. Efflorescence (<i>white patches on surface</i>).	High water-cement ratio in mix. High quantity of free lime released during hydration.	Reduce water - cement ratio. Use pozzollana cement.
7. Spalling.	Usage of concrete of low strength. Form lining is not absorbent. Cement used is slow setting. Cement used is adulterated Evaporation of moisture in concrete which is required for hydration due to severe temperature conditions coupled with wind. Improper grading or insufficient cement, sand, mortar in the mix.	Use concrete of sufficient strength. Use absorbent form lining. Use cement of appropriate setting time or use accelerators. In case of suspected adulteration, carryout necessary field tests to ascertain whether the cement is adulterated or not prior to incorporating in the work. In case the initial setting time has not lapsed, the concrete may be tempered by adding a little quantity of water having regard to water-cement ratio and then mixing before use. Use richer mix with sufficient fine aggregate.

FIELD TESTS :

1. Test of cement adulterated with stone dust :

Take a sample of the doubtful stuff and heat the same on a clean steel plate with the help of a stove for about 20 minutes. If the cement changes in colour, it is indicative of adulteration of cement with stone dust whereas genuine cement does not undergo any colour change.

2. Test of cement adulterated with fly ash :

Take a small quantity of the doubtful stuff in a glass tumbler and add water till the tumbler is half full. After vigorous agitation of the content allow the mixture to settle. If the cement is adulterated with ash, it could be seen that the ash particles either float or remain in suspension with the cement particles settling down.



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The TNPWDEA e-magazine, "Poriylar Neram," has been created to highlight departmental activities, provide updates on the promotion panel status, and serve as a technical guide for Civil, Electrical, and Architectural engineers.

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