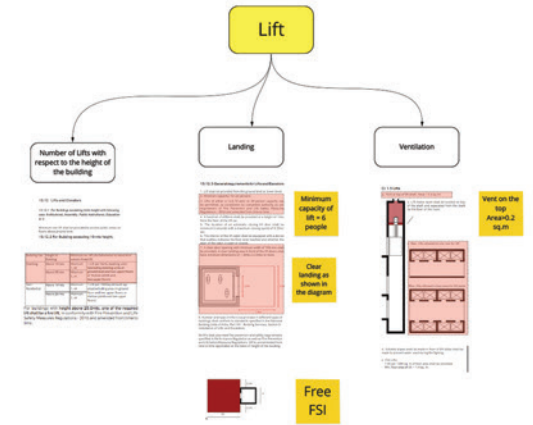
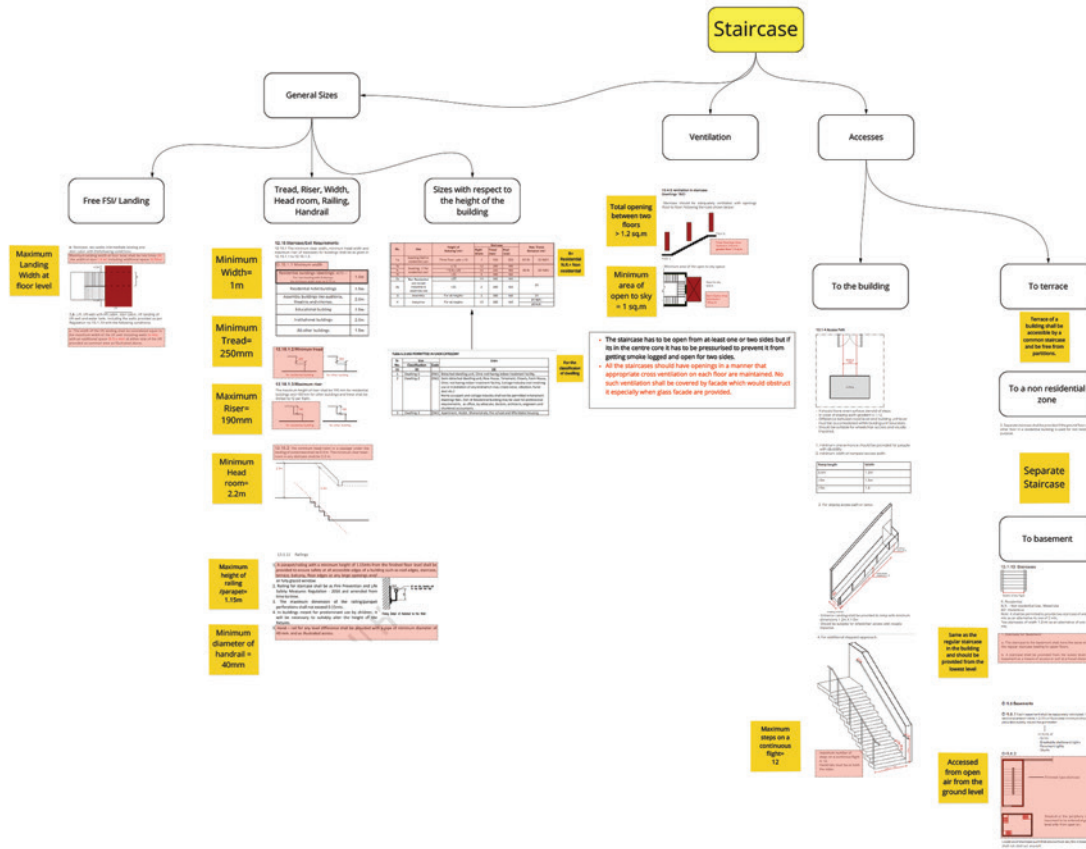


# Time Problem Preparation

ACCESSED DURING TIME PROBLEM



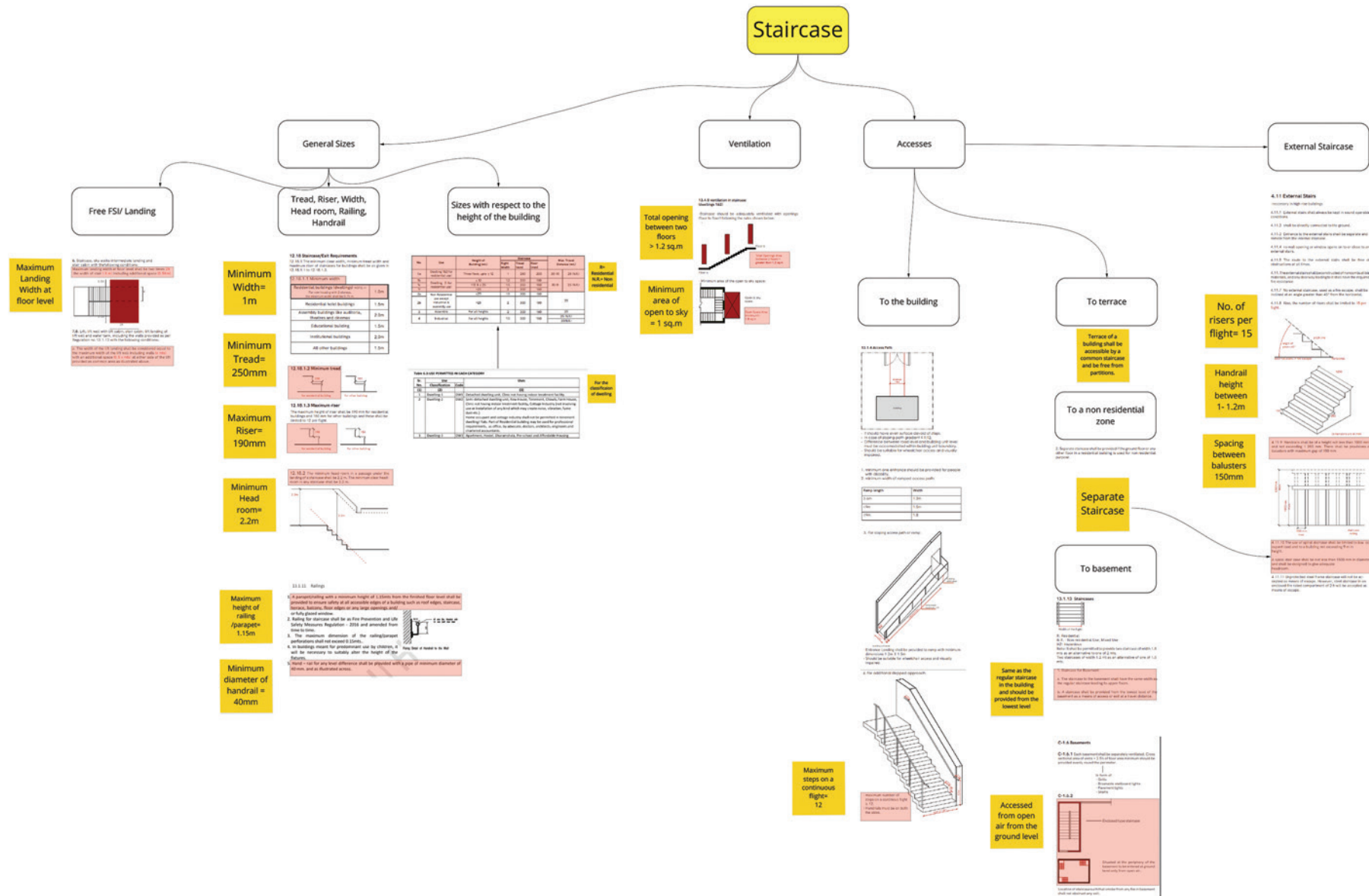
# DURING TIME PROBLEM - Circulation



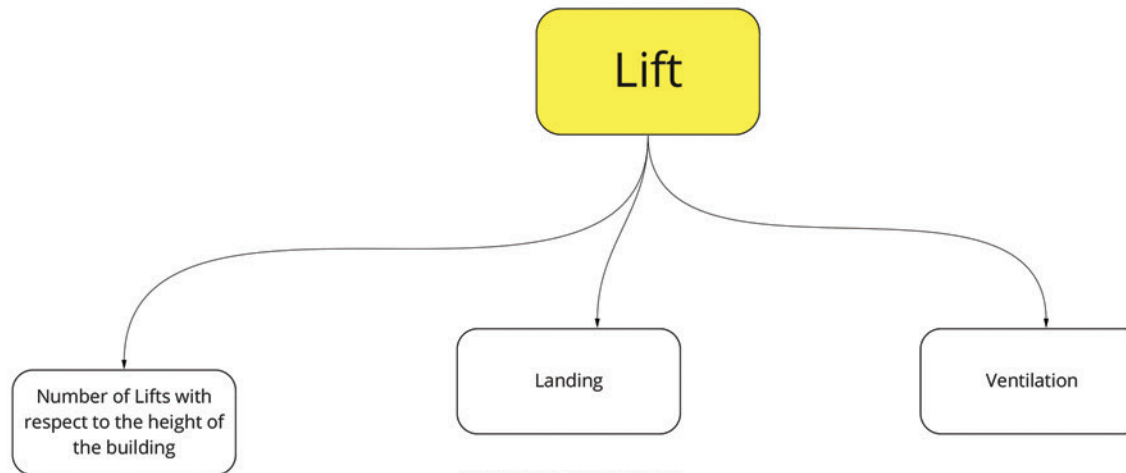
| Minimum Staircase width                                  | 1 m   |
|--|---|
| Minimum Tread Width                                      | 250 mm  |
| Maximum Riser  | 190 mm<br>12 steps per flight   |
| Minimum head room  | 2.2 m   |
| Handrail height  | between 1000-1200mm   |
| Landing of the Staircase at floor level                  | -twice the width of the stair (2x), with 0.5x additional width<br>-Not included in FSI                    |
| External Staircase                                       | -Connected to the ground<br>-Separate entrance<br>-No wall opening to the staircase<br>-Free of obstacles |
| External Staircase As Fire Escape                        | -Inclines to an angle: 45 degree<br>-15 steps per flight  |
| Baluster Spacing   | 150 mm  |
| Spiral Staircase   | -Low occupant load<br>-building height 9 m<br>-diameter = 1500mm<br>-adequate headroom                    |
| For Access Paths to building for disabled people         | -min. one entry designed for disabled people (refer diagram for ramp and additional stair)                |
| Staircase to Basement                                    | -Same as to the one leading to the above floors   |
| For an additional staircase to a non-residential purpose | Refer Table   |
| Ventilation in Staircase                                 | -opening area between two floors > 1.2 sq.m   |

| Lift Landing         | -maximum width (w) of the lift with 0.5x on each side<br>-not included in FSI  |
|----------------------|--|
| No. of Lift          | -1 lift per 30 dwellings (excluding the dwelling on ground floors and two above floors or hollow plinth and two upper floors)<br>or<br>-1 lift for building height above 10m<br>-2 lifts for building height above 25m |
| Ventilation for Lift | Vent at top of lift shaft<br>Area > 0.2 sq.m   |

# DURING TIME PROBLEM - Circulation



# DURING TIME PROBLEM - Circulation



Number of Lifts with respect to the height of the building

### 13.12 Lifts and Elevators

13.12.1 For Buildings exceeding 4mts height with following uses: Institutional, Assembly, Public Institutional, Educational-2

Minimum one lift shall be provided to access public areas on floors above ground level.

13.12.2 For Building exceeding 10 mts height,

| Building Use    | Height of Building | Minimum no. of Lifts (whichever is more from column A and B)   |
|-----------------|--------------------|--|
| Dwelling        | Above 10 mts       | Minimum 1, or 1 Lift per thirty dwelling units (including dwelling units on ground level and two upper floors)                               |
|                 | Above 25 mts       | Minimum 2, or 1 Lift per thirty dwelling units (including dwelling units on ground level and two upper floors)                               |
| Non-Residential | Above 10 mts       | Minimum 1, or 1 Lift per 1000sq. mt built-up area (excluding area on ground floor and two upper floors or below plinth and two upper floors) |
|                 | Above 25 mts       | Minimum 2, or 1 Lift per 1000sq. mt built-up area (excluding area on ground floor and two upper floors or below plinth and two upper floors) |

For buildings with height above 25.0mts, one of the required lift shall be a fire lift, in conformity with Fire Prevention and Life Safety Measures Regulations - 2016 and amended from time to time.

### 13.12.3 General requirements for Lifts and Elevators

1. Lift shall be provided from the ground level or lower level.

2. Minimum capacity for six persons.

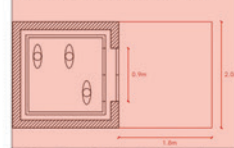
3. Lifts of either or 4.8.12 and/ or 24 person capacity can be permitted, as considered by competent authority as per requirement of Fire Prevention and Life Safety Measures Regulations - 2016 and amended from time to time.

4. A handrail of 50mm shall be provided at a height of 1mts from the floor of the lift car.

5. The duration of an automatic closing lift door shall be minimum 5 seconds with a maximum closing speed of 0.25m/ sec.

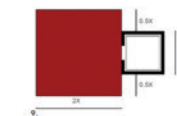
6. The interior of the lift cabin shall be equipped with a device that audibly indicates the floor level reached and whether the door of the cabin is open or closed.

7. A clear door opening with minimum width of 900 mm shall be provided. A clear landing area in front of the lift doors shall have minimum dimensions of 1.8mts x 2.0mts or more.



8. Number and type of lifts to be provided in different types of buildings shall conform to standards specified in the National Building Code of India, Part VIII - Building Services, Section 5- Installation of Lifts and Escalators.

All lifts shall also meet fire prevention and safety requirements specified in Performance Regulation as well as Fire Prevention and Life Safety Measures Regulations - 2016, and amended from time to time applicable on the basis of height of the building.



Minimum capacity of lift = 6 people

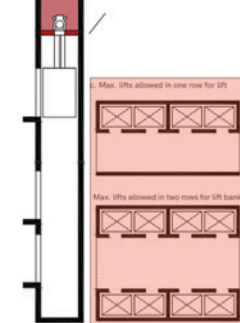
Clear landing as shown in the diagram

Free FSI

### C- 1.5 Lifts

a. Vent at top of lift shaft. Area > 0.2 sq.mt.

b. Lift motor room shall be located on top of the shaft and separated from the shaft by the floor of the room.



d. Suitable slopes shall be made in floor of lift lobby shall be made to prevent water used during fire fighting.

e. Fire Lifts  
- 1 lift per 1200 sq. m of floor area shall be provided.  
- Min. floor area of lift = 1.4 sq. m.

Vent on the top Area > 0.2 sq.m





# DURING TIME PROBLEM - Fire Safety

Do I need to provide Fire fighting installation

**YES** At all means

Quick exit  
Not for death  
Need for death



need to read about hydrant system and fit in flow chart

24.1. Hydrant system

- 13) ON/OFF switches located near the hose reel hose or hydrant outlet, at each floor for the main Fire Pump at the underground water tank, with a capacity to discharge 600 litres per minute at 2 bar pressure on measurement of the barock level should be installed.
- 14) The riser for the building extending 10 meters height should not be of less than 150mm internal diameter. The riser should be connected to the bottom of the barock tank with a stop valve and a NRV to act as a check-valve.
- 15) One riser is required for every 1000sqm (modern floor area and if the building is divided into two or more parts then each part should have a separate riser with all the fittings at each floor level.
- 16) Each floor should have one hydrant outlet with a coupling for attaching a 65mm dia hose.
- 17) 25mm bore fire-rated hose with 3mm shut-off nozzle at each floor level. The length of the hose reel hose should be enough to reach the full extent of the floor.
- 18) Hose reel with 16 metres long 65mm dia. hose and 13.5mm bore nozzle at alternate floors. The hose reel hose should be coupled to the floor.
- 19) Fire-service riser should be installed at a point near the entry to the premises where a fire service vehicle can approach easily.
- 20) The Overhead tank shall be of a capacity of not less than 25,000 litres.
- 21) The underground tank shall be of not less than 1,00,000 litres.

Table 23 Minimum Requirements for Fire Fighting Installation

| Type of building     | Type of installation |                |                |                |                |                |                |                |                |                | Minimum height |                | Approved quality |                |
|----------------------|----------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|----------------|
|                      | Fire hose reel       | Fire hose reel | Fire hose reel | Fire hose reel | Fire hose reel | Fire hose reel | Fire hose reel | Fire hose reel | Fire hose reel | Fire hose reel | Fire hose reel | Fire hose reel | Fire hose reel   | Fire hose reel |
| 1) Residential (A/B) | 100                  | 100            | 100            | 100            | 100            | 100            | 100            | 100            | 100            | 100            | 100            | 100            | 100              | 100            |
| 2) Commercial (A/B)  | 100                  | 100            | 100            | 100            | 100            | 100            | 100            | 100            | 100            | 100            | 100            | 100            | 100              | 100            |
| 3) Industrial (A/B)  | 100                  | 100            | 100            | 100            | 100            | 100            | 100            | 100            | 100            | 100            | 100            | 100            | 100              | 100            |



ACCESS

EXIT REQUIREMENTS

FOR Buildings >25m

REFUGE AREA

REFUGE AREA IS AN AREA WHERE PEOPLE UNABLE TO USE THE STAIRS CAN REMAIN TEMPORARILY

Staircase

Lift

Basement

The staircase has to be open from at least one or two sides but if its in the centre core it has to be pressurized to prevent it from getting smoke logged and open for two sides.

H > 21m at least 2 lifts should be provided with one lift being fire lift

Standard only fire lift 91-27m

No. of risers per flight = 15

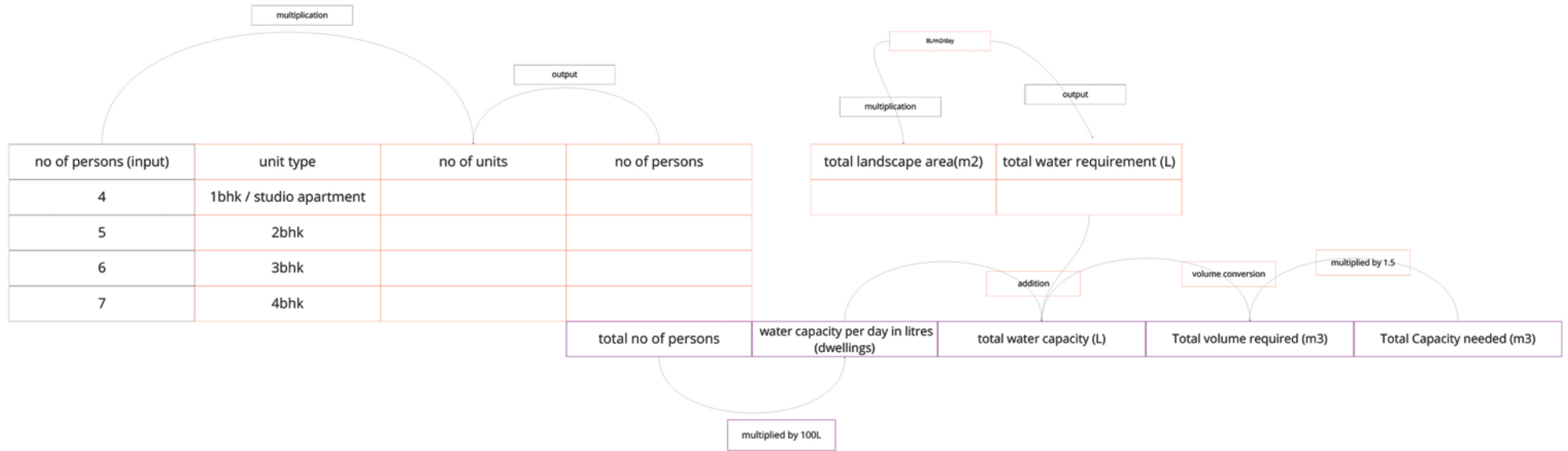
Handrail height between 1-1.2m

Spacing between balusters 150mm





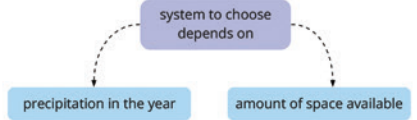
# DURING TIME PROBLEM - Watertank size





# DURING TIME PROBLEM - Rainwater Percolation

in Ahmd, it is better to recharge ground water rather than use a Rainwater Storage System



75mm

Table 28 Sizing of Rain-Water Pipes for Roof Drainage (Cover 5.5-18.6 ft)

| Size of Pipe      | 50    | 75   | 100  | 125  | 150  | 200  |
|-------------------|-------|------|------|------|------|------|
| Roof Area (sq ft) | 13.4  | 8.9  | 6.6  | 5.3  | 4.4  | 3.3  |
| Roof Area (sq m)  | 1.2   | 0.8  | 0.6  | 0.5  | 0.4  | 0.3  |
| Roof Area (sq ft) | 24.3  | 16.0 | 12.9 | 9.6  | 8.0  | 6.0  |
| Roof Area (sq m)  | 2.2   | 1.5  | 1.2  | 0.9  | 0.7  | 0.6  |
| Roof Area (sq ft) | 35.3  | 27.0 | 21.7 | 16.3 | 13.7 | 10.3 |
| Roof Area (sq m)  | 3.2   | 2.5  | 2.0  | 1.5  | 1.3  | 1.0  |
| Roof Area (sq ft) | 100.0 | 69.7 | 53.8 | 41.8 | 35.3 | 26.7 |
| Roof Area (sq m)  | 9.3   | 6.4  | 5.0  | 3.8  | 3.2  | 2.5  |

NOTE: For rain-water pipes of other materials, the roof area shall be multiplied by 0.85 (coefficient of roughness of surface of the material).

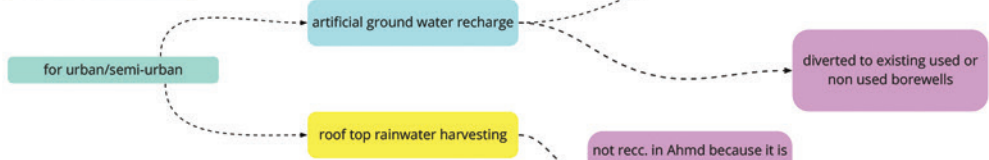


Table 29 Rainwater Available from Roof Top Harvesting (Cover 5.5-18.6 ft)

| Roof Area (sq ft) | Roof Area (sq m) | Annual Rainfall (mm) | Annual Rainfall (in) | Annual Rainfall (ft) | Annual Rainfall (m) | Annual Rainfall (mm) x Roof Area (sq ft) | Annual Rainfall (mm) x Roof Area (sq m) |
|-------------------|------------------|----------------------|----------------------|----------------------|---------------------|--|---|
| 13.4              | 1.2              | 75                   | 3.0                  | 0.25                 | 0.025               | 1005                                     | 90                                      |
| 8.9               | 0.8              | 75                   | 3.0                  | 0.25                 | 0.025               | 675                                      | 60                                      |
| 6.6               | 0.6              | 75                   | 3.0                  | 0.25                 | 0.025               | 500                                      | 45                                      |
| 5.3               | 0.5              | 75                   | 3.0                  | 0.25                 | 0.025               | 398                                      | 35                                      |
| 4.4               | 0.4              | 75                   | 3.0                  | 0.25                 | 0.025               | 323                                      | 28                                      |
| 3.3               | 0.3              | 75                   | 3.0                  | 0.25                 | 0.025               | 242                                      | 21                                      |

to calculate rainwater harvesting potential:

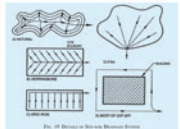
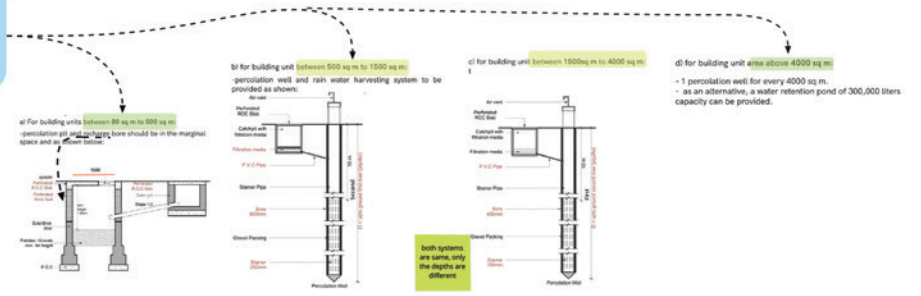
Rainfall (mm) x area of catchment x runoff coefficient

ROOFTOP:  
= 751 x (>insert area<) x 0.8

GROUND SURFACE COVERINGS  
= 751 x (>insert area<) x 0.6

calculations are there in the main excel sheet

PERCOLATION WELLS: make it in the site margins



# DURING TIME PROBLEM - Trees

all scales of site can/should have trees

try to use trees which are easily available and local to the context

what tree? (more info for each in excel)

(pictures of each tree in excel too)

link to data for trees

[https://docs.google.com/spreadsheets/d/1VbX6LJcqssLNm187Z455zHCpr2Z4\\_eAURbPnkgTwoA/edit#gid=0](https://docs.google.com/spreadsheets/d/1VbX6LJcqssLNm187Z455zHCpr2Z4_eAURbPnkgTwoA/edit#gid=0)

| Shading Trees   | Bird Attracting Trees         | Compound Edge Trees | Flower Shedding Trees | Wind Breaker Trees  |
|-----------------|-------------------------------|---------------------|-----------------------|---|
| Neem            | Khati-Amlil (Sour Imlil Tree) | Asopalav/Ashoka     | Gulmohar              |   |
| Peepal          | Mango                         | Deshi Baval         | Siris                 |   |
| Deshi Baval     | Jamun                         | Gando Baval         | Garmalo               |   |
|                 | Neem                          | Coconut             | Peltophorum           |   |
|                 | Deshi Baval                   | Karanj              |                       |   |
| Climbable Trees | Divider Trees                 | Ornamental Trees    | Next to Garbage Trees | Root Info   |
| Banyan          | Saptarni                      | Saptarni            | Raat raani            | Mango- 6ft root depth   |
| Mango           | Champa                        | Champa              | Karanj                | Coconut/Palm- 0.5/0.8m depth  |
|                 |                               |                     |                       | Guilmohar- "not deep rooted"  |
|                 |                               |                     |                       | Banayan- very deep roots/large spread   |
|                 |                               |                     |                       | Peepal - very deep roots/large spread   |
|                 |                               |                     |                       | Neem- atleast 10ft away from structure and sapling should be planted atleast 3ft in the ground. |
| Peepal          | Palms                         | Palms               | Bamboo                | Bamboo- 0.5m depth  |
| Neem            |                               | Sirus               |                       |   |

link to CAD file for trees

[https://drive.google.com/file/d/1\\_zdXk2PSeJF2ZOUhqHkdgzO0vParcD1/view?usp=sharing](https://drive.google.com/file/d/1_zdXk2PSeJF2ZOUhqHkdgzO0vParcD1/view?usp=sharing)

more info arriving soon!

# DURING TIME PROBLEM - Waste Disposal

## 2.2.1.2 STORAGE OF MUNICIPAL SOLID WASTE AT SOURCE

### 2.2.1.2.1 Household-level Storage of Segregated Waste

At the household level, dry waste, wet waste, and domestic hazardous waste should be stored in separate garbage bins, of appropriate capacity and colour (Figure 2.3). The colour of the garbage bins should be in accordance with the SWM Rules, 2016; wet waste is to be placed in a covered green bin and dry waste in a covered white bin. Because the rule does not specify the colour of the bins for storage of domestic hazardous waste, urban local bodies (ULBs) should decide on an appropriately coloured bin. For example, Coimbatore City Municipal Corporation uses red bins for collection of domestic hazardous waste. Capacity of bins depends on frequency of collection (daily, alternate day, or on demand) and quantity of waste generated.

Family of 5 + 0.015m<sup>3</sup> backup required is 100% 12-15L bin

A container of 12-15l (0.015 m<sup>3</sup>) capacity for a family of five members should be adequate for each dry and wet waste, if collection takes place daily. However, a household may keep larger containers or more than one container for waste produced in 24 hours, having a spare capacity of 100% to meet unforeseen delays in clearance or unforeseen extra loads. If dry waste is not collected daily, container capacity has to be enlarged accordingly. Wet waste collection bins should be washed by the household each time they are emptied. It is not desirable to use plastic bags in waste bins.

In large apartment complexes and multistoried buildings, gated communities large waste collection bins for wet waste and dry waste should be placed at a convenient location. Residents should deposit segregated waste in the respective bins either themselves or through organised door-to-door collection system of the resident welfare association (RWA) or community-based organisation (CBO). Specification of bins and containers shall be compatible with primary collection vehicles, if applicable.

Typical specifications for garbage bins used in apartment complexes and large buildings are the following: 60l (25kg) bins suitable for 12 households, 120l (50kg) bins for 24 households, 240l (96 kg) bins for 48 households, etc. that are of standard quality, high-density polyethylene (HDPE), injection or roto molded, ultraviolet (UV) tested, durable and could withstand rough handling, and compatible with lifting mechanism on primary collection vehicle, if applicable. The specific size of the containers depends on the number of connected households and the frequency of collection.

dimensions of various capacity of bins



6 dwellings 8 dwellings 12 dwellings 24 dwellings 36 dwellings

friendly; these are the outstanding features of the wheeled plastic containers by OTTO.

Material high density polyethylene (HDPE)

- Environment-friendly
- Long service life
- Suitable for recycling
- Frost-resistant
- Resistant to chemicals
- High resistance to UV radiation



Deeper combs ensure optimum accommodation on the lifting device

|                          | 60  | 80  | 120  | 240  | 360  |
|--------------------------|-----|-----|------|------|------|
| Nom. volume (L)          | 60  | 80  | 120  | 240  | 360  |
| Dead weight approx. (kg) | 8.4 | 9   | 10.5 | 14.3 | 22.2 |
| Useful load (kg)         | 40  | 45  | 60   | 110  | 136  |
| A - Overall height (mm)  | 658 | 760 | 540  | 1080 | 1170 |
| B - Overall width (mm)   | 470 | 480 | 480  | 580  | 670  |
| C - Overall depth (mm)   | 550 | 550 | 550  | 730  | 845  |
| D - Upper edge comb (mm) | 583 | 735 | 670  | 1000 | 1090 |
| E - Wheel diameter (mm)  | 200 | 200 | 200  | 200  | 300  |

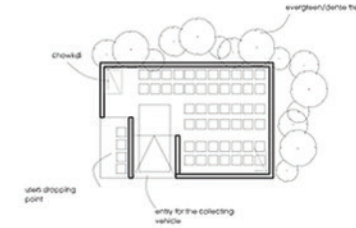
\*Subject to technical modifications

Containers according to IS6840

## TIME PROBLEM PREPARATIONS- 04

Garbage area:

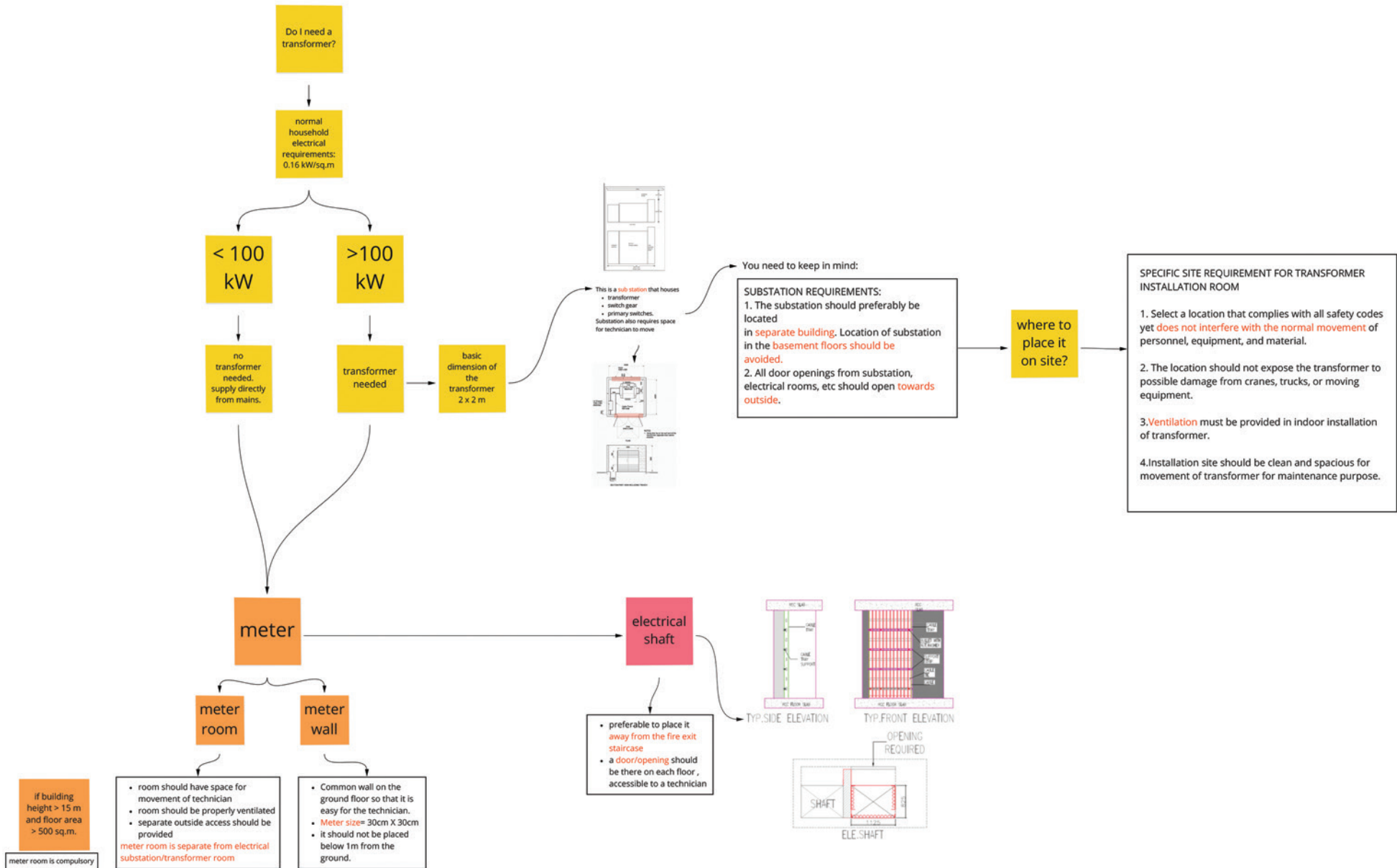
- Provision for entry of collecting vehicle.
- 1 unit= 10l waste/day (according to GDCR)
- Capacity of 50 bins (80l) which caters to 400 units)



Chirag UA2514



# DURING TIME PROBLEM - Electric





# DURING TIME PROBLEM - Ground

50% of your plot area should allow water to percolate into the ground.

hard ground





soft ground







all vehicular movement should have hard ground

|                     |   |   |
|---------------------|---|---|
| Paving for vehicles |  |  |
| Concrete Pavers     |   |   |
| Cobblestone paving  |  |   |

pedesetrian options

| Paving for Pedestrians        |                |
|-------------------------------|----------------|
| Non Slip                      | Smooth         |
| Brick Paving                  | Terrazo        |
| Cobblestone paving            | IPS            |
| Rough finish, concrete paving | Textured tiles |
| Plastic Grass Paver           |                |
| Concrete Grass Paver          |                |

| Water Percolation/ Soft Ground |  |
|--------------------------------|--|
| Gravel                         |    |
| Soil                           |    |
| Lawn Grass                     |    |
| Wild grass                     |  |
| Sand                           |  |
| Water Body                     |  |

| Play                          |   |
|-------------------------------|---|
| Play Turf                     |    |
| Sand                          |    |
| Textured tiles- smooth finish |    |
| Plastic Grass Paver           |   |
| Concrete Grass Paver          |  |
| Artificial Grass              |  |

| with time and seasons might change character | Moss Growth Possibility |
|--|-------------------------|
|  | Brick Paving            |
|  | Rough concrete Paving   |
|  | Cobblestone paving      |

[https://docs.google.com/spreadsheets/d/1sQ-Rfsr\\_qYt7bTQqNsBw\\_p2PZK0izYmyLvJHH\\_WylXRqw/edit?usp=sharing](https://docs.google.com/spreadsheets/d/1sQ-Rfsr_qYt7bTQqNsBw_p2PZK0izYmyLvJHH_WylXRqw/edit?usp=sharing)

link to basic ground cover kinds/options

[https://drive.google.com/file/d/1s2QmkFycuLXmGojjiT\\_qh9Xyor7y6LOLC/view?usp=sharing](https://drive.google.com/file/d/1s2QmkFycuLXmGojjiT_qh9Xyor7y6LOLC/view?usp=sharing)

link to CAD file for hatches

# DURING TIME PROBLEM - Trees

all scales of site can/should have trees

try to use trees which are easily available and local to the context

link to data for trees

[https://docs.google.com/spreadsheets/d/1VbX6LJcqssLNm187Z455zHCpr2Z4\\_eAURbPnkgTwoA/edit#gid=0](https://docs.google.com/spreadsheets/d/1VbX6LJcqssLNm187Z455zHCpr2Z4_eAURbPnkgTwoA/edit#gid=0)

what tree? (more info for each in excel)

(pictures of each tree in excel too)

| Shading Trees   | Bird Attracting Trees         | Compound Edge Trees | Flower Shedding Trees | Wind Breaker Trees  |
|-----------------|-------------------------------|---------------------|-----------------------|---|
| Neem            | Khati-Amlil (Sour Imlil Tree) | Asopalav/Ashoka     | Gulmohar              |   |
| Peepal          | Mango                         | Deshi Baval         | Siris                 |   |
| Deshi Baval     | Jamun                         | Gando Baval         | Garmalo               |   |
|                 | Neem                          | Coconut             | Peltophorum           |   |
|                 | Deshi Baval                   | Karanj              |                       |   |
| Climbable Trees | Divider Trees                 | Ornamental Trees    | Next to Garbage Trees | Root Info   |
| Banyan          | Saptparni                     | Saptparni           | Raat raani            | Mango- 6ft root depth   |
| Mango           | Champa                        | Champa              | Karanj                | Coconut/Palm- 0.5/0.8m depth  |
|                 |                               |                     |                       | Gulmohar- "not deep rooted"   |
|                 |                               |                     |                       | Banayan- very deep roots/large spread   |
|                 |                               |                     |                       | Peepal - very deep roots/large spread   |
|                 |                               |                     |                       | Neem- atleast 10ft away from structure and sapling should be planted atleast 3ft in the ground. |
| Peepal          | Palms                         | Palms               | Bamboo                | Bamboo- 0.5m depth  |
| Neem            |                               | Sirus               |                       |   |

link to CAD file for trees

[https://drive.google.com/file/d/1\\_zdXk2PSeJF2ZOUhqHkdgz00vParcD1/view?usp=sharing](https://drive.google.com/file/d/1_zdXk2PSeJF2ZOUhqHkdgz00vParcD1/view?usp=sharing)

more info arriving soon!