

Architecture & Town Planning

Lecture 3:
Building Bye-Laws



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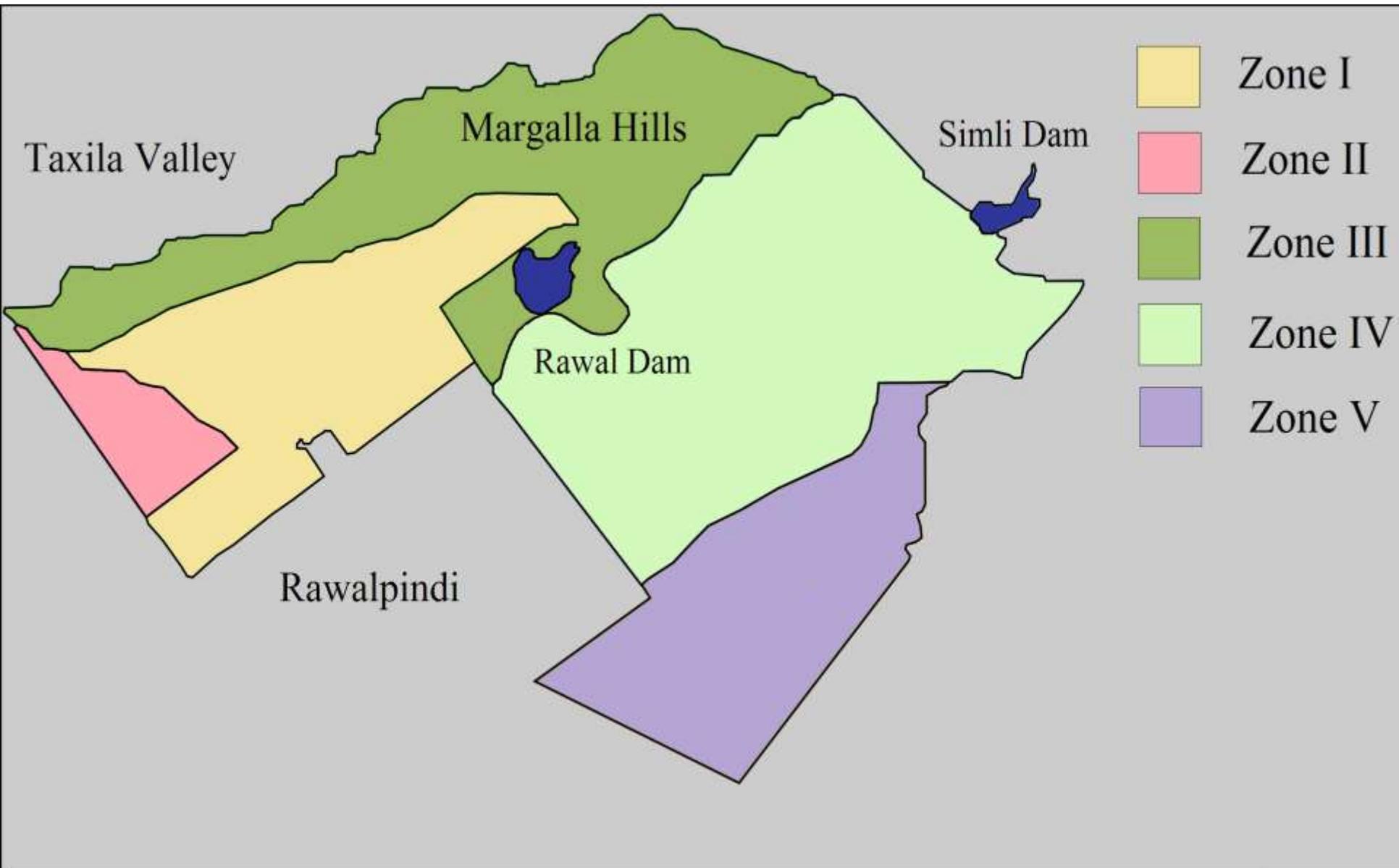
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Zoning and Building Codes/Permit

- Zoning and building codes are closely related, they both serve different functions. Prior to construction, you must first get a zoning permit before obtaining a building permit through your local planning agency.
- ZONING CODES regulate the type of structures that can be built in a given location, as well as how that structure interacts with the land it will be built upon.
- BUILDING CODES deal with the structure itself: its physical features and how these characteristics affect safety and accessibility. U.S. buildings fall under the International Building Code,



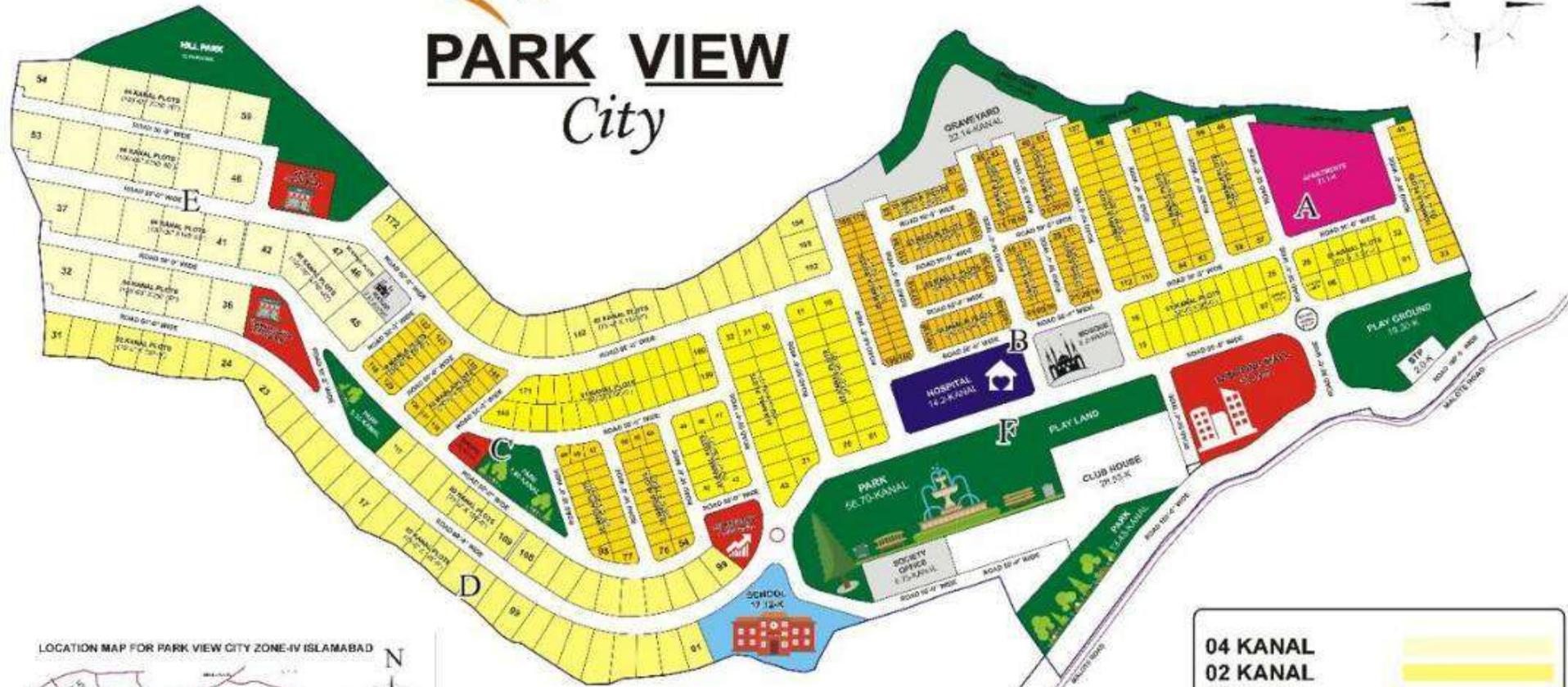
Zoning Plan of Islamabad



Park View City, Islamabad



PARK VIEW *City*



LOCATION MAP FOR PARK VIEW CITY ZONE-IV ISLAMABAD



04 KANAL	
02 KANAL	
01 KANAL	
10 MARLA	
05 MARLA	
PARK	
MOSQUE	
SCHOOL	
CLUB HOUSE	
COMMERCIAL	

Building Bye-Laws

Building Bye laws are the rules and regulations set forth by the concerned government authorities and updated time to time. These are standards for **building** work. Their aim is to ensure the health and safety of people in and around **buildings** by setting requirements for building design and **construction**. The **bye-laws** also promote energy efficiency and aim to improve access for disabled people.



Objective of Building Bye-laws

- Pre-planning of building activity (to regulate new and proposed constructions)
- Allow orderly growth (uniformity in construction) and prevent haphazard development.
- Provisions of by-laws usually afford safety against fire, noise, health hazard and structure failure.
- Provide proper utilization of space to achieved maximum efficiency in planning.
- They provide health, safety and comfort to the people who live in building.
- Due to these bye-laws, each building will have proper approaches, light, air and ventilation.



Scope of building bye-laws

- Building frontage line
- Minimum plot size
- Area Limitation
- Built up area of building
- Height of building and Clear heights
- Plinth height
- Projection margin
- Margin (Set Backs)
- Provision of safety such as Emergency exit, Stair case limits and Provision of lifts
- Water supply, drainage, proper light and ventilation
- Requirement for off street parking space and Ramp ratio
- Size of structural element



DIFFERENT TYPES OF BUILDINGS

Buildings are classified in to two categories-

- (A) Based on Occupancy
- (B) Based on types of Construction
- (C) Based on Fire Resistance Rating



Types of Buildings Based on Occupancy

1. Residential Buildings
2. Educational Buildings
3. Institutional Buildings
4. Assembly Buildings
5. Business Buildings
6. Mercantile Buildings
7. Industrial Buildings
8. Storage Buildings
9. Hazardous Buildings



A- Residential Buildings

A1-Lodging or Rooming Houses

- No cooking facility having maximum 40 beds. It includes guest houses, motels, inns

A2-One or Two-family Private Dwellings

- It is occupied by one or two families. Dwellings should have max 3 persons per room and total 20 persons or less sleeping accommodation

A3-Dormitories

- Group sleeping accommodation is provided for persons who are not members of the same family e.g. hostels and military barracks.

A4-Apartment Houses (flats)

- Three or more families living independently of each other with independent cooking facilities

A5-Hotels

- A place where sleeping accommodation is provided. e.g. 4 star and below hotels

A6-Hotels (starred)

- These includes 5 star and above hotels



Single-family attached (small multi-family)

- Duplex, semi-detached, double-decker, or two-family
- Triplex, triple-decker or three-family
- Quadplex, quadruple, or four-family
- Townhouse or terraced house

Large multi-family

- Garden or walk-up apartments: 1-5 stories, 50-400 units, no elevators
- Mid-rise apartments: 5-9 stories, 30-110 units, with elevators
- High-rise apartments: 9+ stories, 100+ units, professionally managed



B-Educational Buildings

- These shall include any building used for school, colleges other training institutions for day-care purposes involving assembly for instruction, education or recreation for not less than 20 students.
- If residential accommodation is provided in the schools/ institutions, that portion of occupancy shall be classified as a dormitory.



C-Institutional Buildings

C1-Hospitals and Sanatoria

- Persons suffering from physical imitations because of health or age, for example, hospitals, infirmaries (caring for patients not treating), sanatoria (Specialized treatment for chronic diseases) and nursing homes (old people with medical treatment).

C2-Custodial Institutions

- Buildings used for the custody and care of persons, such as children, convalescents and the aged, for example, homes for the age and infirm (not Physically or mentally strong) e.g. Retirement Home, convalescent homes (Recovery) and orphanages.

C3-Penal and mental institutions

- Buildings used for housing persons under restraint, or who are detained for penal (Punishment) or corrective purposes e.g., jails, prison, mental hospitals, mental sanatoria and reformatories (young offenders are sent there)



D-Assembly Buildings

- Buildings where number of persons not less than 50 congregate or gather for amusement, recreation, social, religious, civil, travel and similar purposes

Examples:

- Theaters, motion picture, art galleries, assembly halls, auditorium, exhibition halls, community halls, marriage halls, places of worship, museums, lecture halls, passenger stations & terminals, heritage and Archeological Monuments, skating rinks, gymnasiums, restaurants, places of worship, club rooms, recreation piers, grandstands (for spectators at sports grounds), stadium, amusement park structures, reviewing stands (raised platform from which military and political leaders watch military parades), circus tents, Multiplexes having shopping, cinema theatres and restaurants all in one



Skating Rink



E-Business Buildings

- Principal function of these buildings is transaction of public business (other than Group F) and keeping of books, accounts and records and similar purposes professional establishments, services facilities, etc.

Examples:

- Offices, banks, offices of doctors, police stations, Laboratories, libraries, test houses (Quality assurance companies), Telephone exchanges, Broadcasting stations and T.V. stations



TV Station



F-Mercantile Buildings

- These shall include any building or part of building, which is used as shops, stores, market, for display and sale of merchandise (goods bought or sold), either wholesale or retail.

Examples:

- Shops, stores, departmental stores, Underground shopping centers, storage and service facilities incidental to the sale of merchandise and located in the same building shall be included under this group.



Departmental Store



G-Industrial Buildings

- Building or structure in which products or materials of all kinds and properties are fabricated, assembled, manufactured or processed e.g. assembly plants, industrial laboratories, dry cleaning plants, power plants, gas plants, refineries, dairies and saw- mills etc.



H-Storage Buildings

- Building used primarily for the storage or sheltering of goods, ware or merchandise (except those that involve highly combustible or explosive products or material) vehicles or animals, for example, warehouses, cold storage, freight depots, transit sheds (Temporary sheds for cargo), storehouses, truck and marine terminals, garages, hangars (storing aircraft), grain elevators, barns (for housing livestock, storing dairy products etc.) and stables storage (horses are kept here)
- In these type of buildings the presence of persons is relatively small in number or in proportions to the area



Grain Elevators



I-Hazardous Buildings

- Building used for the storage, handling, manufacture or processing of highly combustible or explosive materials or products which are liable to burn with extreme rapidity and or which may produce poisonous fumes or explosions for storage ,handling, manufacturing or toxic or noxious alkalis, acids or other liquids or chemicals producing flame ,fumes and explosive, poisonous , irritant or corrosive , gases; and for the storage, handling or processing of any material producing explosive mixtures of dust which result in the division of matter into fine particles subject to spontaneous ignition.

EXAMPLES:

- Storage of acetylene, hydrogen, illuminating and natural gases, sulphur dioxide, carbon dioxide, methyl oxide and all gases subject to explosion, fumes or toxic hazards, cryogenic gases etc.
- Storage and handling of hazardous and highly inflammable liquids, liquefiable gases like LPG, etc.
- Storage and handling of hazardous and highly inflammable or explosive material (other than liquid)
- Manufacturing of artificial flowers, synthetic leathers and fireworks.



Types Of Buildings On The Basis Of Construction

1. Framed Structure
2. Load Bearing structures
3. Composite Structure



FRAMED STRUCTURE

- They consist of a skeleton of beams and columns. The load is transferred from beams to the columns and column intern transfer the load directly to the sub soil through footing.
- Framed structures are suitable for multistory building subjected to variety of extreme loads like compressive, tensile torsion, shear along with moment. The open space in the skeleton are to be filled with brick walls or glass panels.



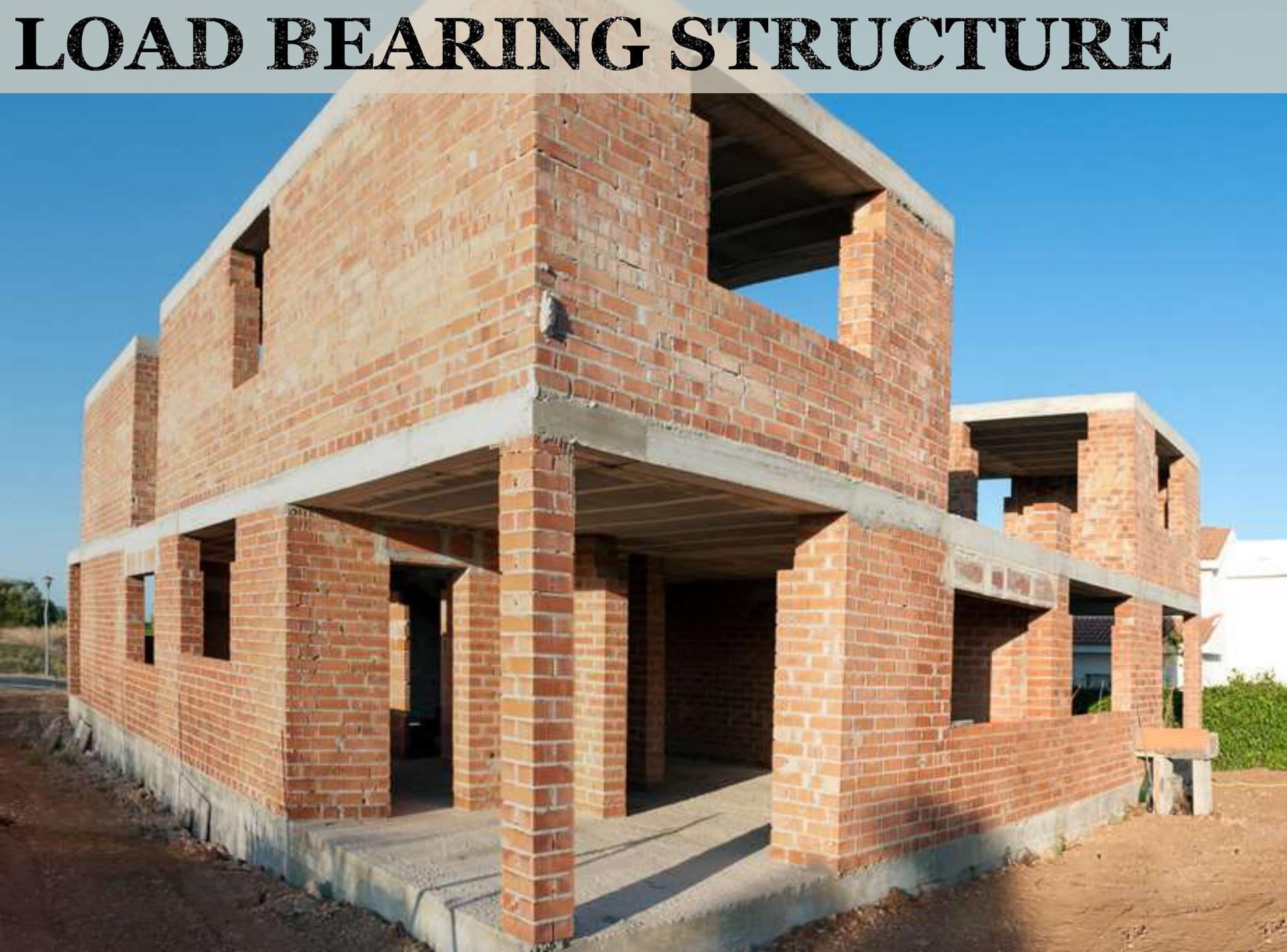
FRAMED STRUCTURE



LOAD BEARING STRUCTURE

- In this type of structures loads from roof slab or trusses and floors are transmitted through walls to the firm soil below the ground. This types of structures are adopted where hard strata are available at shallow depth. The structural elements like beams, slabs rest directly on the walls.
- Thickness Requirements for Load Bearing Masonry Wall. The thickness of load bearing masonry wall should be at least 1 ft. thick for maximum wall height of 35 ft. For upper stories the thickness can be minimized to 8”





COMPOSITE STRUCTURE

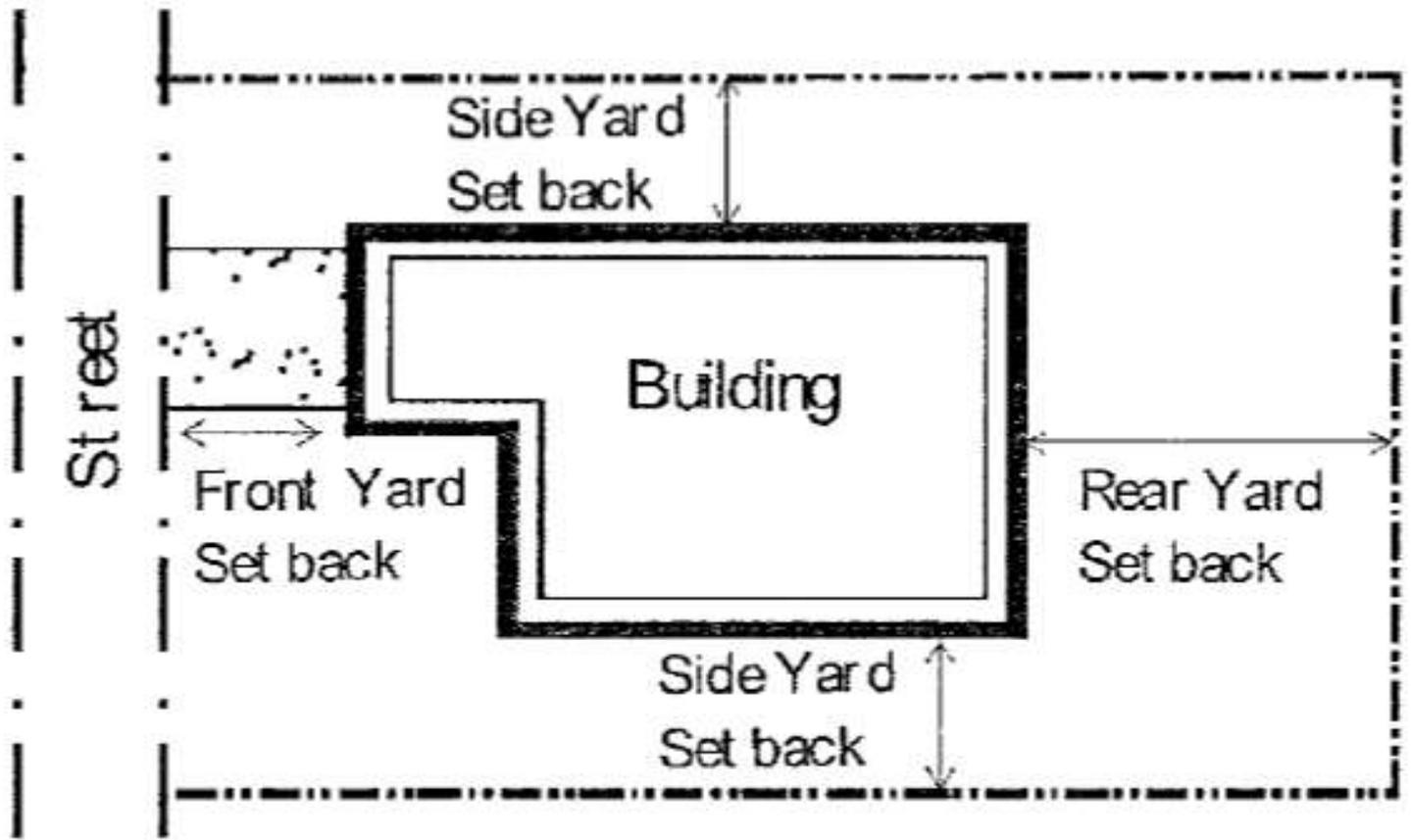
- A composite structure is a combination of both load bearing as well as framed structure. This is known as composite . In this type of structure external walls are treated as load bearing walls and all intermediate supports are in the form of R.C.C columns.
- These structures are preferred for the buildings having large spans such as warehouses, workshops, halls, large factory sheds etc.



Understanding FAR & Set-backs



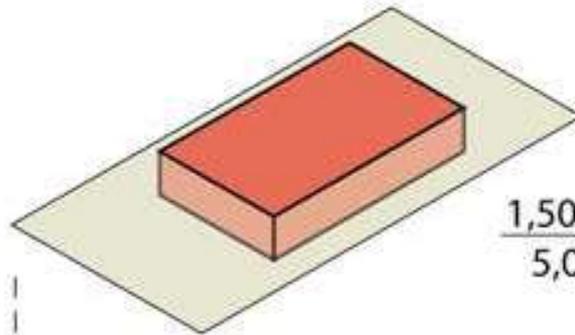
Set back distance



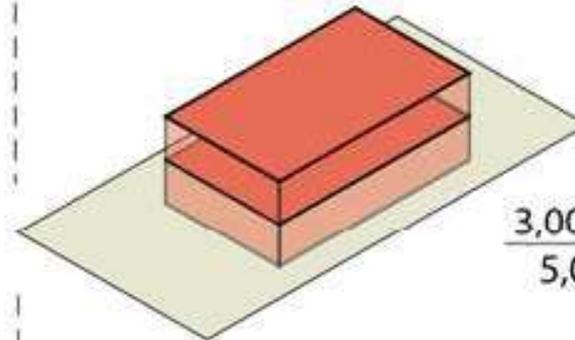
Advantage of set-back

- Better condition of air, light and ventilation.
- At corners it improve visibility and safety from traffic.
- Space for parking.
- Protection of building from street noise.
- Reduce the danger of fire from neighbor house.
- It provide privacy in building.

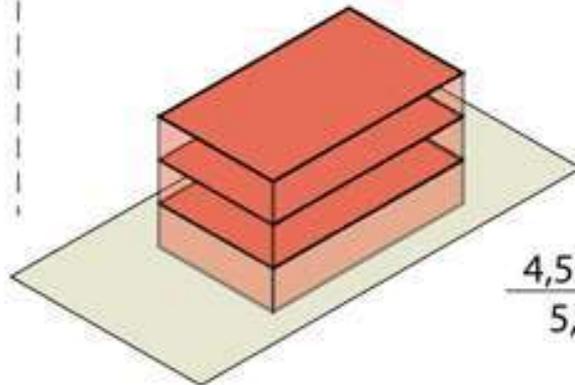




$$\frac{1,500 \text{ sf. FLOOR AREA}}{5,000 \text{ sf. LOT AREA}} = 0.3 \text{ FAR}$$



$$\frac{3,000 \text{ sf. FLOOR AREA}}{5,000 \text{ sf. LOT AREA}} = 0.6 \text{ FAR}$$



$$\frac{4,500 \text{ sf. FLOOR AREA}}{5,000 \text{ sf. LOT AREA}} = 0.9 \text{ FAR}$$



PDA Bye-laws (Residential)



Plot Size	Set Backs			Basement Provision	Building Foot Print	Plot to Floor Area (FAR)	Mumty Provision
	Front	Back	Sides				
Plot up to 2 Marla's	100% covered with 10% void			100% G-Coverage	100%-10% Void	1:2 (GF+FF)	100 sqft
Above 2 Marla's - less than 5 Marla	Void = Not less than 10% of the plot Area			100% G-Coverage	100%-10% Void	1:2 (GF+FF)	120 sqft
Above 5 Marla's - less than 8 Marla	7ft	5ft	10% void	100% G-Coverage	75%-10% Void	1:1.8 (GF+FF)	120 sqft
Above 8 Marla's - less than 10 Marla	10ft	10ft	1 side = 5ft	100% G-Coverage	80% of Plot Area	1:1.25 (GF+FF)	140 sqft
Above 10 Marla's - less than 1 Kanal	10ft	10ft	1 side = 5ft	100% G-Coverage	70% of Plot Area	1:1.15 (GF+FF)	180 sqft
Above 1 Kanal - less than 2 Kanal	15ft	10ft	2 sides = 5ft each	100% G-Coverage	70% of Plot Area	1:1.25 (GF+FF)	220 sqft
2 Kanals - Above	20ft	15ft	2 sides = 10ft each	100% G-Coverage	60% of Plot Area	1:1.25 (GF+FF)	240 sqft

PDA Bye-laws (Parking)



When to provide parking

- When constructing new building
- When changing the use of existing building
- Increasing floor area of existing building



General Conditions

- Parking area and Ramps should be exempted from FAR
- Minimum 1 car Park for every Office, Residence unit or Shop
- Minimum clear height of parking structure without obstruction shall be 7.5 feet.
- Detailed plan clearly showing entry, exit, gradient of ramp, turning radius, storage spaces, circulation and movement of vehicles etc. shall be submitted.
- Parking can be provided on any floor with the ramp as a mean of access.
- 16% of the total car parking space will be utilized to provide space for Motorcycle
- parking @ 6 Motorcycles and 8 bicycles for every one car.
- Minimum one car lift with standby generator shall be provided for every 40 cars, if parking level is at more than 40ft in height from road level.



Standards for Parking Spaces

DESCRIPTION	FOR CAR	FOR MOTORCYCLES
Bay width	8 ft	2.5 ft
Bay length	16 ft	6.0 ft
Gradient of ramp	1:7.5	1:8.5
Straight turning radius (outer)	24 ft	-
Helical ramp turning radius	32 ft	-
Lot turning radius	17.5 ft	-
Minimum ramp & driveway width:		
Two-way traffic	18 ft	
One-way traffic	10 ft	
Minimum space for parking one car	8 ft. x 16 ft	