

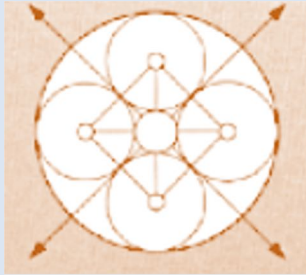


Rethinking the Green City - A Social Sustainability and Inclusion Perspective

Dr. Khaled Galal Ahmed

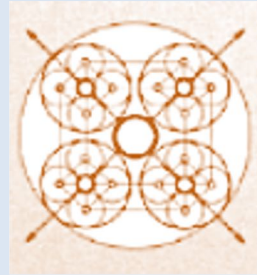
Associate Professor, UAEU

Introduction



❑ The Urban Neighborhood

- Smallest 'building block' which the city is made up.
- Population large enough to support local services and facilities.
- Mixed population
- Shared access to certain amenities located in walking distance from homes.
- Services and facilities located at the mixed-use center of the neighborhood and around the transport node.
- Catchment areas for services and facilities overlap with other neighborhoods.
- Variety of house and tenure types.



❑ Clusters of Neighborhoods Forming Urban Districts

- Several neighborhoods form a district that its core becomes the district main service zone.
- Linked with the neighborhoods centers by public transportation.
- Large catchment areas to accommodate commercial activities and other workplaces.
- All means of transportation could share the same road space including private cars, buses and LRT

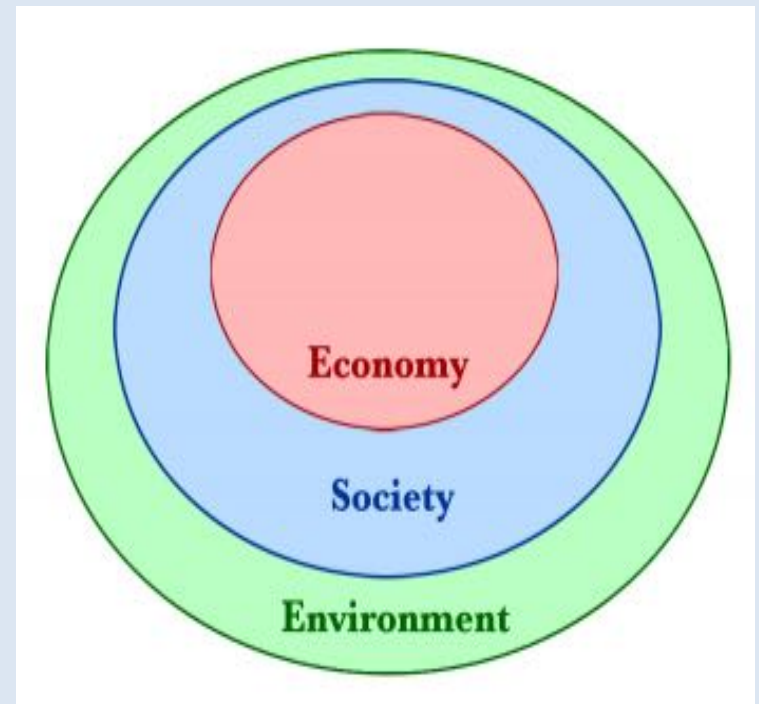


❑ The Composite Structure of the City or City Region

- The structure of such a net city is provided by the different nodes and areas and the linkages between them.
- Hierarchical composition of spatial and formal entities.
- Provision of a hierarchical system of public transport.

Introduction

- A *sustainable urban community* is the community that is planned, built, and modified to promote *sustainable living*.



Social Sustainability in Urban Communities

Principles	Indicators	Variables
1- Vitality and social interaction among residents.	1-1 Social activities infrastructure and local activity centers.	1-1-1 Presence of a Friday prayer mosque. 1-1-2 Presence of a kindergarten. 1-1-3. Presence of two primary schools (girls/boys). 1-1-4 Presence of daily needs shops. 1-1-5 Presence of a café shop.
	1-2 Accessibility to the activity centers.	1-2-1 Appropriate amount and variety of medium density housing within and around activity centers. 1-2-2 Local activity centers within walking distance of houses and/or existing or proposed public transport routs.
	1-3 Appropriate design for public spaces to encourage social interaction.	1-3-1 Local activity centers structured as mixed use centers. 1-3-2 Local activity centers detailed to provide a high quality public space. 1-3-3 Local activity centers supportive of public transport, walking and cycling.
	1-4 Social cohesion among the residents.	1-4-1 Relationship among neighbours.
	1-5 The residents' identification with their neighborhood.	1-5-1 Duration of stay in the neighborhood. 1-5-2 Preference to stay in the neighborhood.

Social sustainability in urban Communities

2- Integrated public open spaces and neighborhood links to its surroundings.

2-1 Connection to surrounding neighborhoods and activity centers.

2-2 Interconnected streets pedestrian and cyclist networks.

2-3 Accessible parks and public open spaces.

2-4 Appropriate quality and quantity of public open spaces.

2-1-1 Maximum access to public transport services.

2-1-2 Integrated public transport facilities into street design.

2-1-3 Presence of Bus stops.

2-2-1 Grid street design

2-2-2 Avoidance of disconnected streets.

2-3-1 Integrated parks and open spaces into the urban structure within appropriate catchment area.

2-4-1 Parks and open spaces prepared for recreation and social interaction.

3- Pedestrianization and cycling

3-1 Pedestrian and cycling facilities.

3-1-1 Well-connected pedestrian network.

3-1-2 Off road cycle paths.

3-1-3 On road cycle lanes.

3-2 Appropriate movement for pedestrians and cyclists.

3-2-1 Walkable access and cycling routes along the street network, both within and between neighborhoods.

3-2-2 Presence of pedestrian paths through parks and green areas.

3-2-3 Shaded walking pavement.

3-2-4 Good quality pavement.

3-2-5 Well-lit walking pavement and cycle lanes.

3-2-6 Level of usage of pedestrian and bicycles lanes.

3-2-7 Appropriate width of the footpaths and sidewalks.

3-2-8 Obstacles-free pedestrian movement.

Social sustainability in urban Communities

4- Healthy environment

4-1 Avoidance of sources of pollution.

4-1-1 Sources of pollution.

4-1-2 Appropriate locations for garbage containers.

4-1-3 Periodical collection of garbage.

4-1-4 Cleanness of the neighbourhood.

4-2 Solar access and natural ventilation for buildings.

4-2-1 Buildings orientation for solar access.

4-2-2 Buildings orientation for prevailing breeze.

4-3 Green areas and public parks.

4-3-1 Appropriate locations and areas of parks and green areas.

4-4 Children and youth physical activities.

4-4-1 Well-equipped children playgrounds.

4-4-2 Well-equipped youth playgrounds.

4-5 Presence of medical care facilities.

4-5-1 Presence of a clinic.

5- Safe environment

5-1 Safety measures in the neighborhood.

5-1-1 Houses plots arranged to face front streets and parklands.

5-1-2 Well-connected street network.

5-1-3 Well-connected pedestrian and cyclist network.

5-1-4 Well-lit streets, footpaths and cycling routes.

5-1-5 Surveillance of public parkland and green areas through appropriate structuring and design of the Parks.

5-1-6 People encounter through integrated spatial design.

5-1-7 Police Patrol.

Social sustainability in urban Communities

6- Privacy for residents

6-1 Hierarchy of spaces.

6-2 Layout of the housing plots and the streetscape.

6-1-1 Hierarchical street network and open spaces.

6-2-1 Appropriate orientations for houses.

6-2-2 Trees and fences.

7- Housing layout quality and housing diversity

7-1 Various plot sizes with appropriate allocations in the site.

7-1-1 Different residential plot sizes.

7-1-2 Good views through plots layout.

7-1-3 Increased densities in and around the neighborhood centre and public transport stops, and adjacent to higher amenity areas such as parks.

8- Participatory decision making processes relevant to the neighborhood.

8-1 Active participation in meetings.

8-2 Residents intervention in raised problems.

8-3 Involvement in voluntarily work.

8-1-1 Number of meetings.

8-2-1 Residents' initiatives for solving neighborhood relevant problems.

8-3-1 Participation in voluntarily works.

Transition From Urban *Horizontal* Sprawl to *Vertical* Urban Intensification

- Tremendous cost.
- Inability of providing single-family houses to cover all the current and future housing needs.
- This has introduced the notion of developing high-rise residential buildings.
- The suitability of this type of housing to the local Emirati communities,, remains a valid concern.



Socially Sustainable Residential High-Rise Blocks

"It is only in the intensification of our cities and the inclusion of mixed urban-public facilities in the sky that the true vibrant, dense cities of the future can be realized."

Antony Wood, the Urban Habitat executive director

Limited research on human behavioral and social responses to issues of sustainability in high-rise buildings.

Designing Socially Sustainable Residential Block in UAE, that Replaces the Current Unsustainable Rigid Design Strategies.

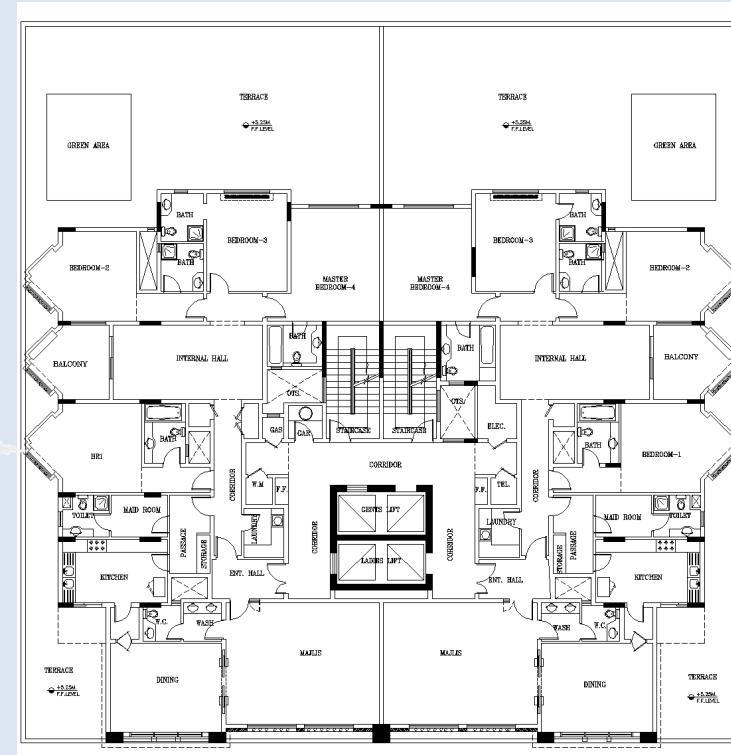


Socially
Sustainable
Residential Block

Dibba Al Hosn Residential Blocks



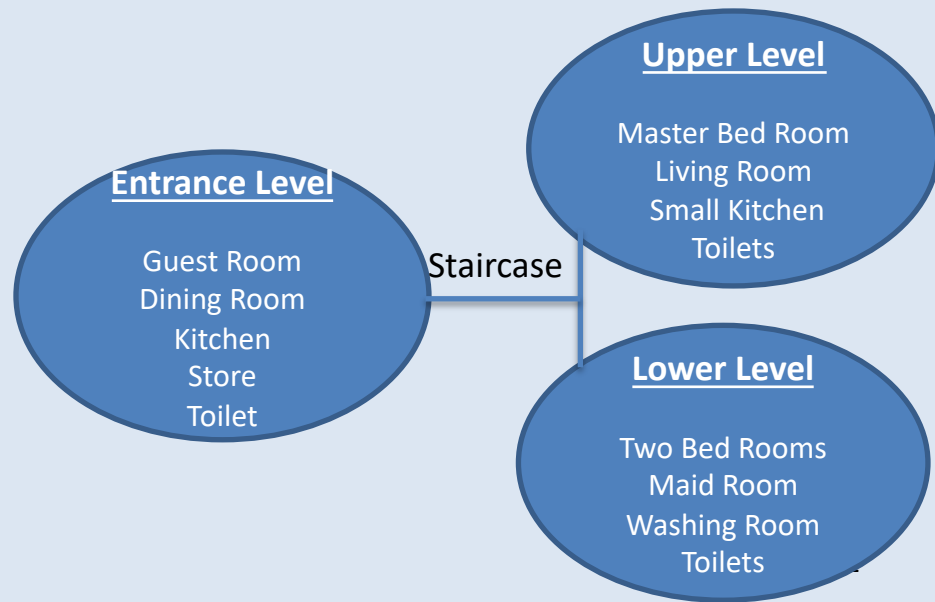
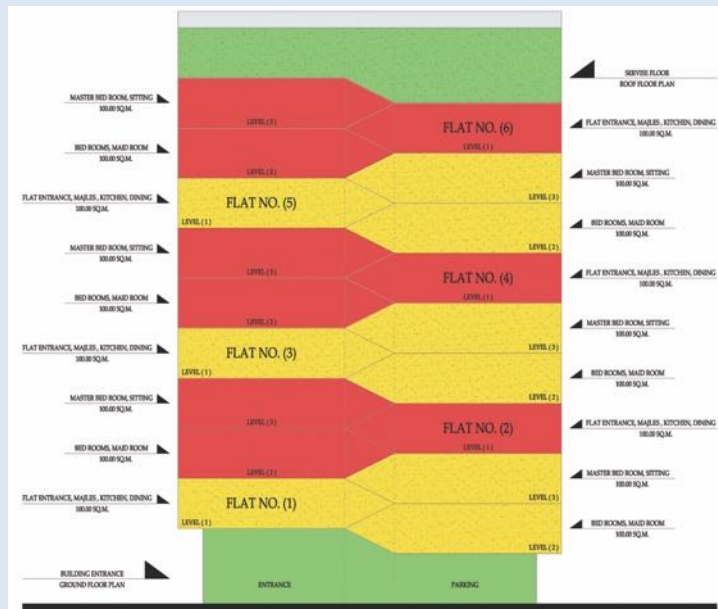
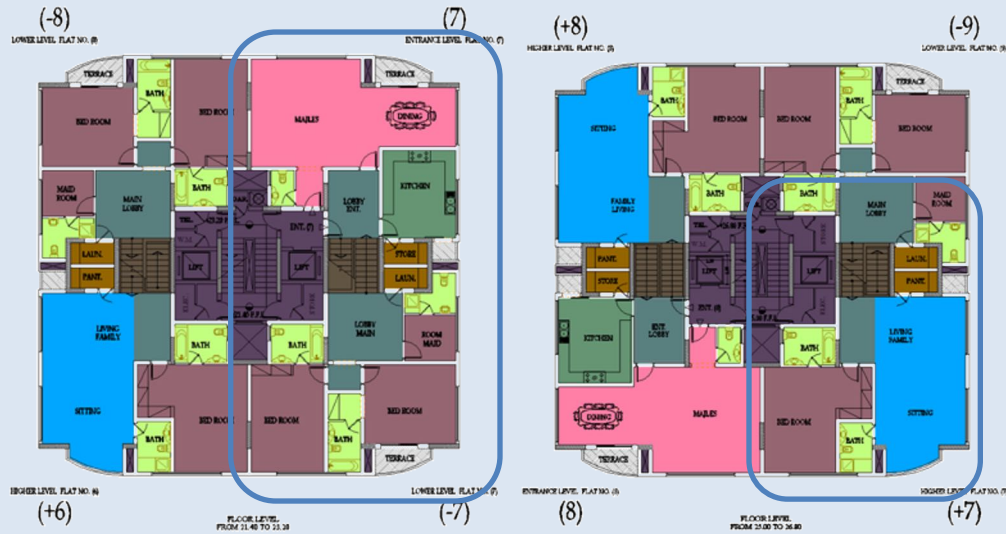
No more land



- The apartment block is conventionally encompassing *a number of isolated flats in isolated floors.*
- Each apartment block is a stand-alone and isolated building with no direct integration with other blocks.
- Sense of belonging and identification with the place is weak due to the conventional design approach of identical 'rigid' design of the housing units and the housing blocks themselves.

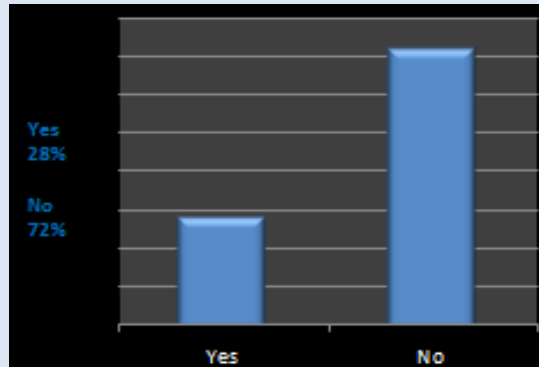


Al Gurfa Residential Block

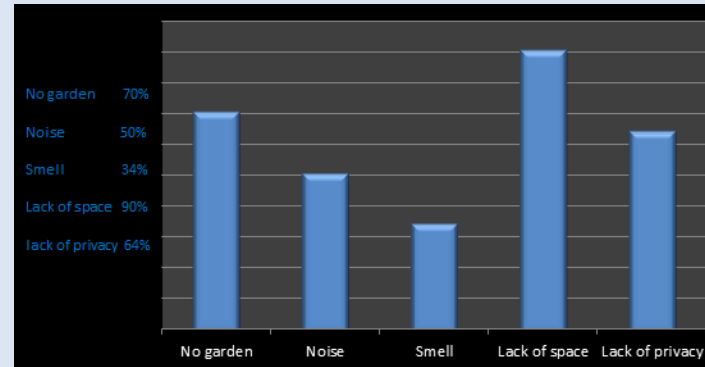


Social Sustainability Evaluation for the Existing Al Gurfa Residential Project

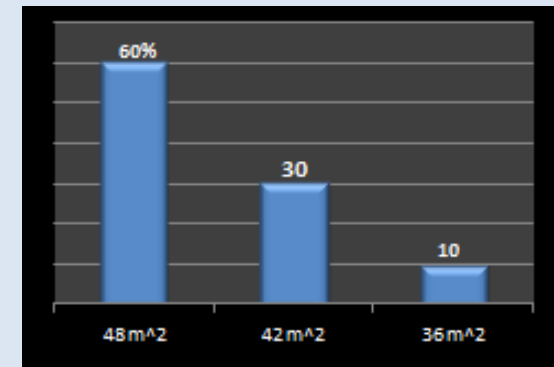
1. Is it suitable for you to live in a flat in a residential block?



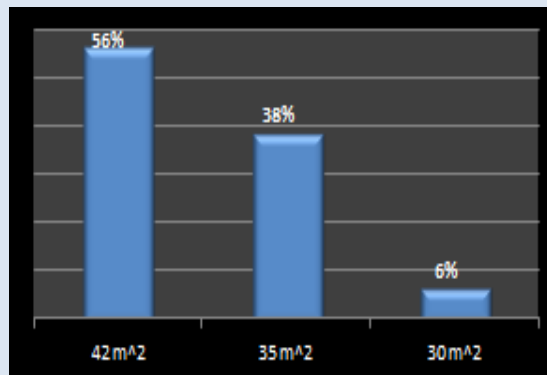
If No, Why?



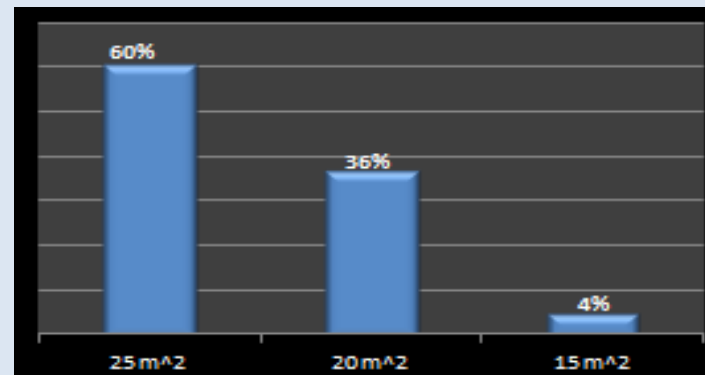
2. If you have to live in a flat, what are the suitable areas for the spaces?



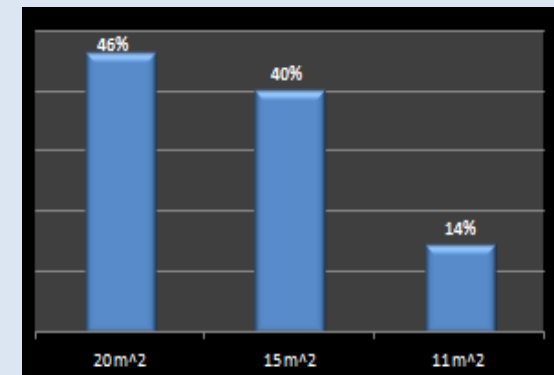
Area of Living room



Area of Majlis



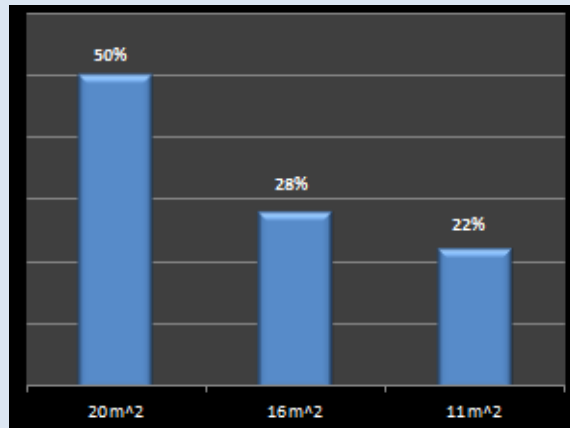
Area of Bedroom



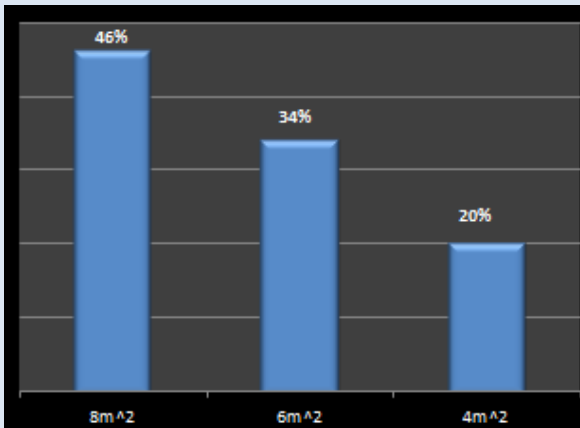
Area of Dining

Social Sustainability Evaluation for the Existing Al Gurfa Residential Project

2. If you have to live in a flat, what are the suitable areas for the spaces?

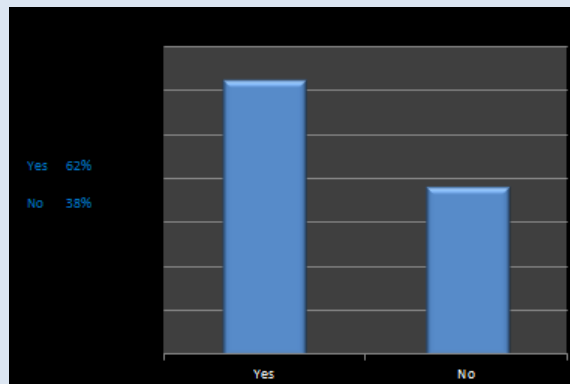
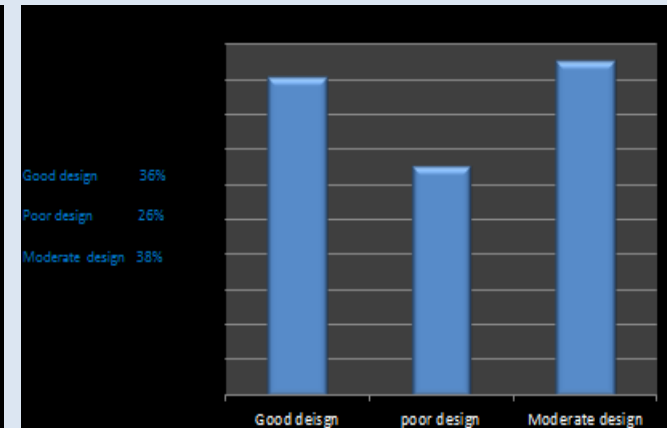


Area Of Kitchen

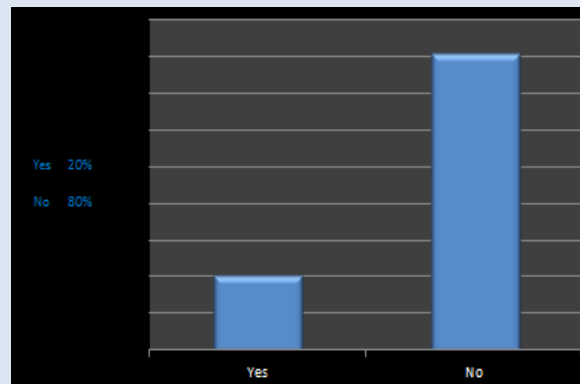


Area Of Toilet

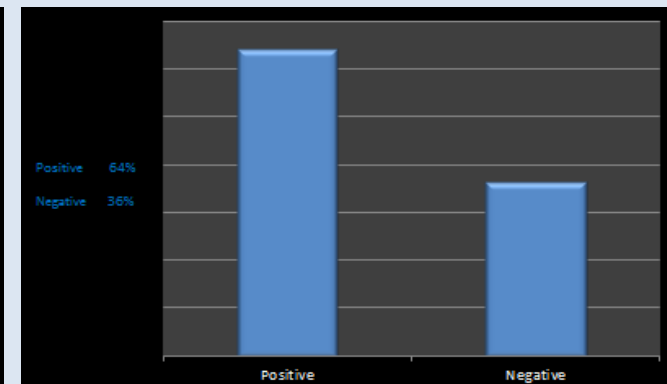
3. After seeing the plans of Al Gurfa residential block, what do you think about the quality of the design?



5. As explained to you, if the designer provided "Sky court", do you think it is important for you?



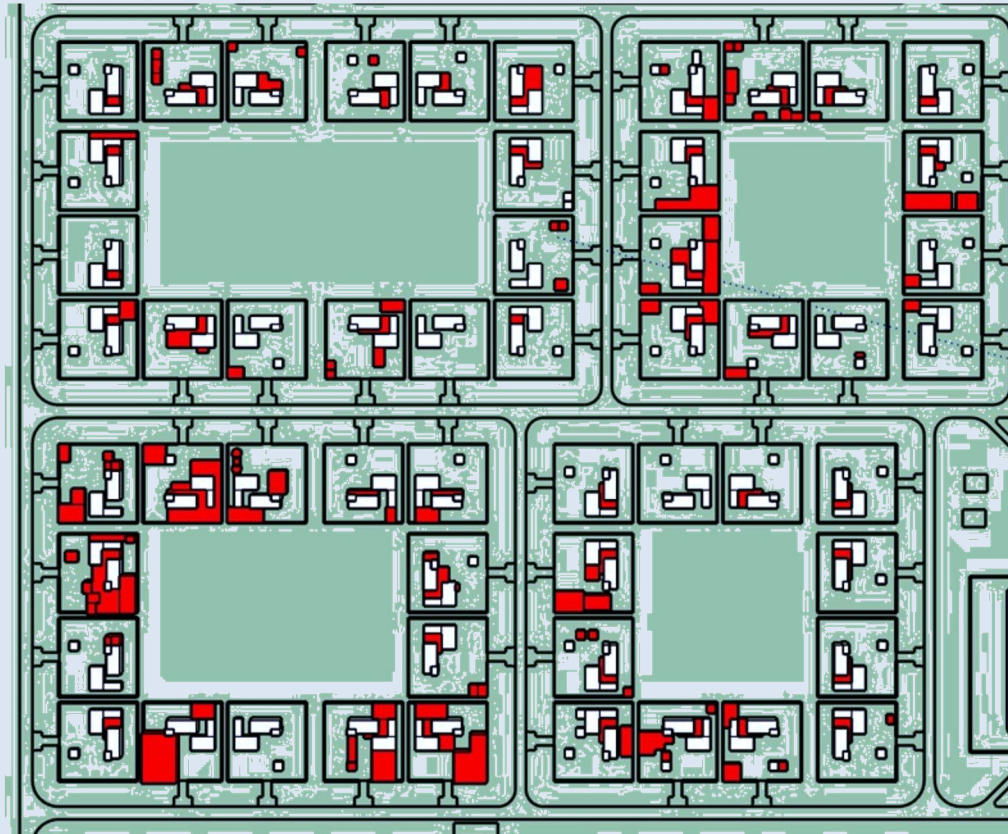
6. What do you think about the design of the façade of Al Gurfa building design?



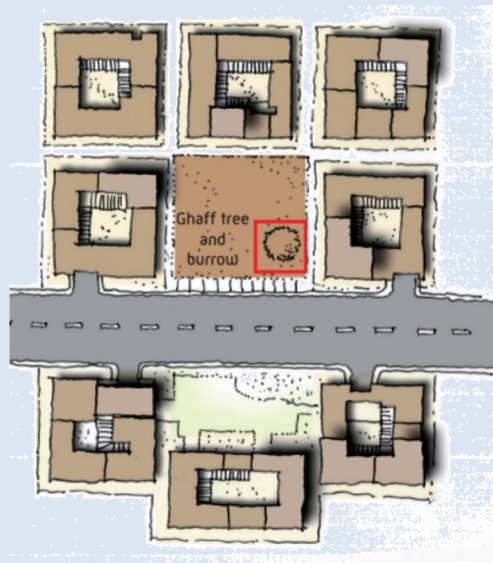
7. In what way do you think that living in a flat is going to affect your relationship with your neighbors?

Alternative Design Approach

Adaptability in the housing unit design helps residents satisfy their changing needs overtime, thus, realizing socially sustainable design.



Building design concepts

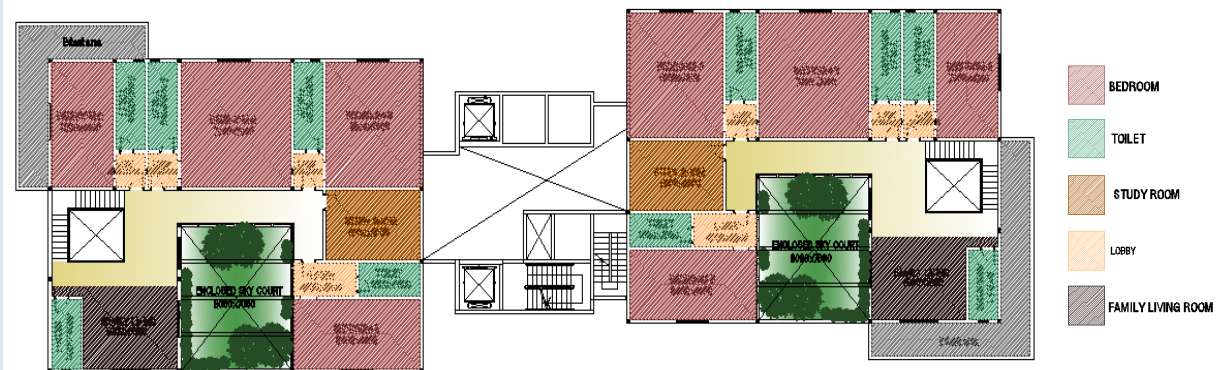


Concept#1: Enclosed Sky Court

First level



Second level



Building design concepts

Concept#2: Open Sky Court



First level



Building design concepts

Final concept : Combination of Enclosed sky court and Open sky court.



Building design concepts

Final concept : Combination of Enclosed sky court and Open sky court.



3D perspective

First level



Building design concepts

Final concept : Combination of Enclosed sky court and Open sky court.



3D perspective

Second level



Building design concepts

Core Scenarios



First Level

Apartment area = 369.68m^2
Level build up area = 965.35 m^2



Second Level

Apartment area = 166.9m^2
Level build up area = 492.2 m^2

Building design concepts

Fully Extended Scenario – All areas for future extension are open sky court



First Level

Apartment area = 471.7 m^2
Level build up area = 1165.5 m^2



Second Level

Apartment area = 470.7 m^2
Level build up area = 1095.7 m^2

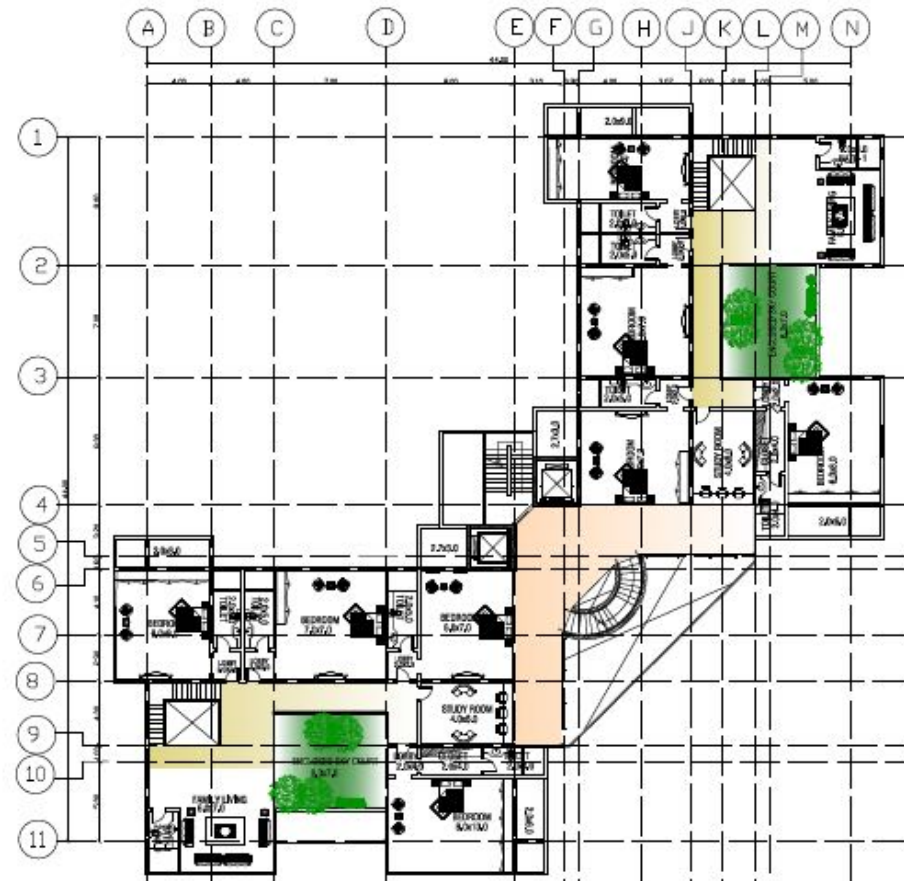
Building design concepts

Fully Extended Scenario – All areas for future extension are included to the spaces



First Level

Apartment area = 462.5 m^2
Level build up area = 1149.6 m^2



Second Level

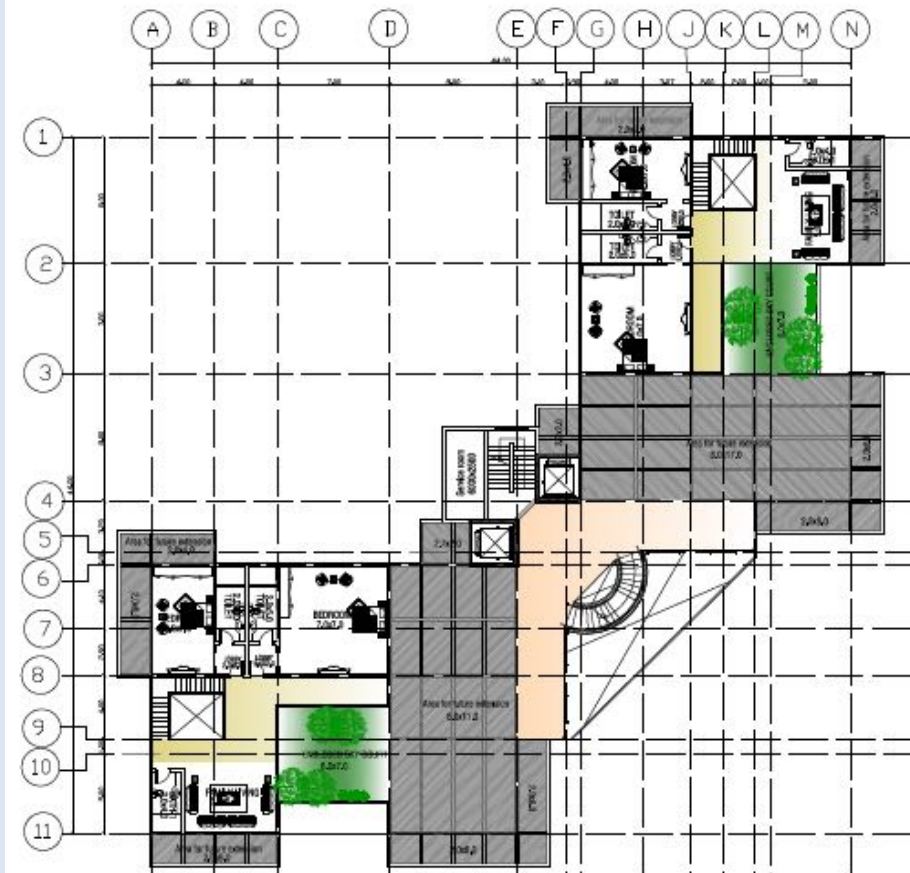
Apartment area = 437 m^2 or 431 m^2
Level build up area = 1035.8 m^2



**Examples of :
Infinite number of residences change , expansion or contraction.**

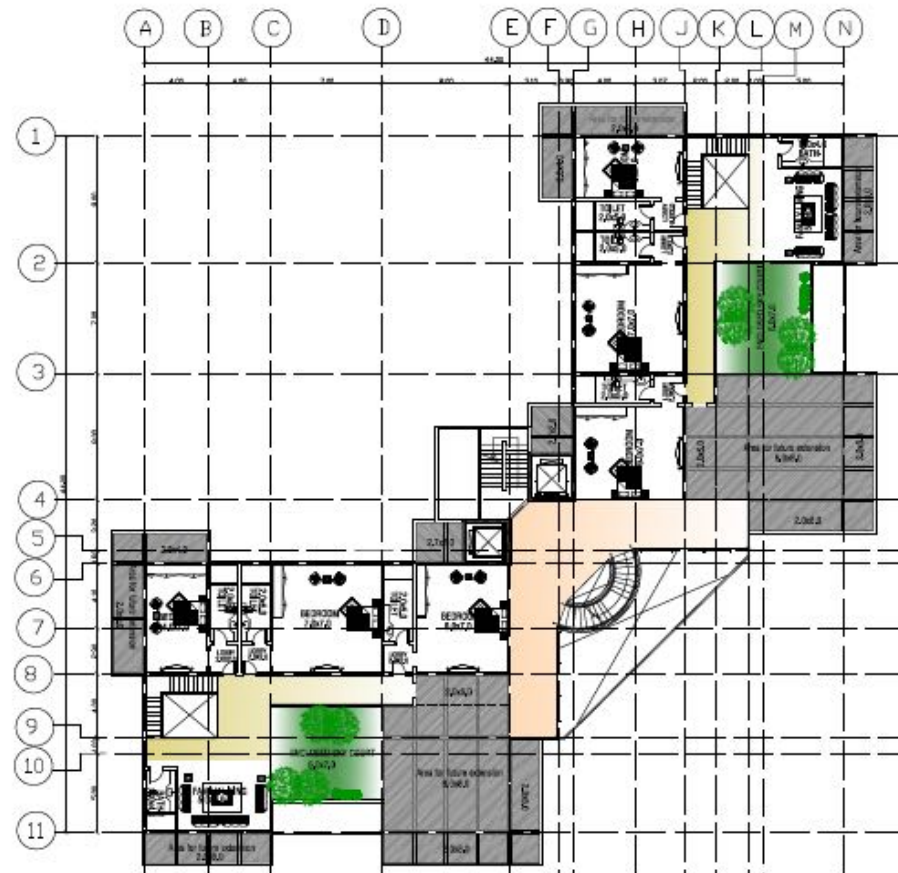
Building design concepts

Examples for : Infinite number of residences change / expansion / contraction



First Level

Apartment area = 248 m^2
Level build up area = 654.4 m^2



Second Level

Apartment area = 309.5 m^2
Level build up area = 777.4 m^2

Building design concepts

Examples for : Infinite number of residences change / expansion / contraction



- 1- Replace bedroom by green/open sky court.
- 2- Extend ladies majlis.
- 3- Extend dining, toilet and men's majlis.

Building design concepts

Examples for : Infinite number of residences change / expansion / contraction

6



Building design concepts

Examples for : Infinite number of residences change / expansion / contraction



- 1-** Dividing the extension area into 2 parts, the first one is an open sky court and the other part is a room could be used according to resident needs.
- 2-** Extend the toilet.
- 3-** Dinning and men's majlis areas are as them in the core scenario, where the extension area is not utilized.
- 4-** Divide the sky court into two parts serving dinning room and men majlis separately.
- 5-** Replace laundry and store by open sky court.
- 6-** Extend ladies majlis and toilet.



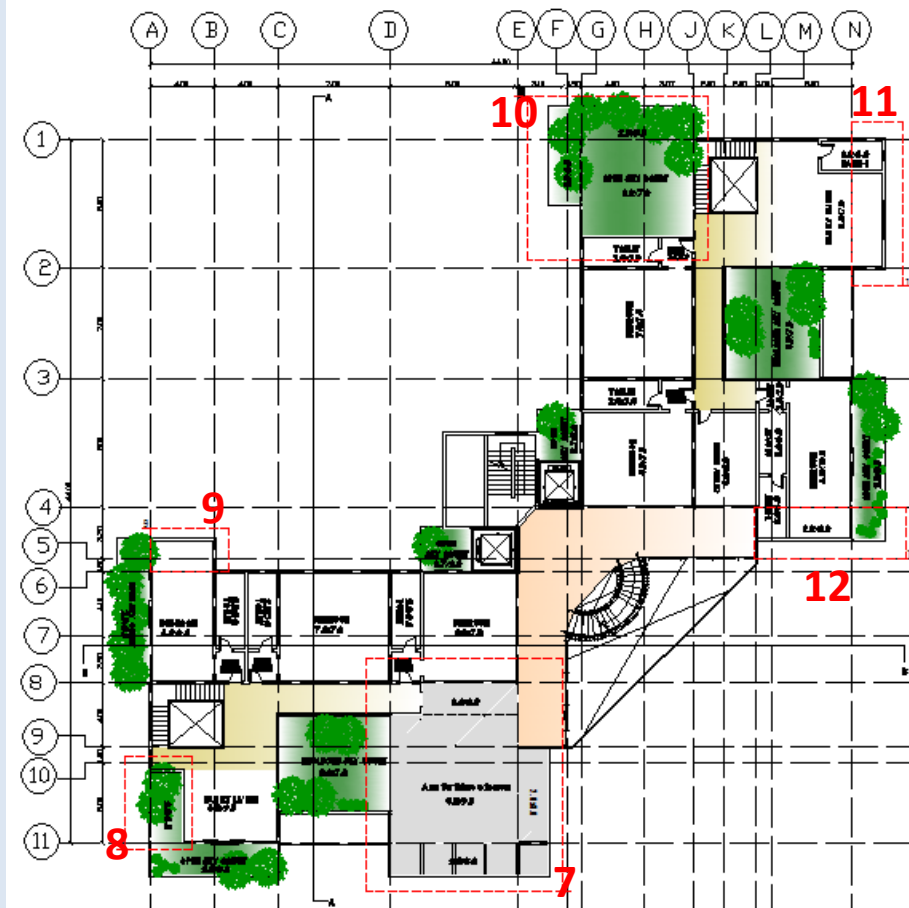
Building design concepts

Examples for : Infinite number of residences change / expansion / contraction



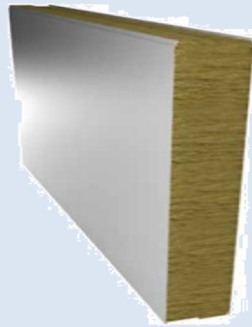
10

- 7-** Resident needs 3 bedrooms only and the rest of the areas are unused.
- 8-** Replace the toilet area by an open sky court.
- 9-** Extend the bedroom.
- 10-** Replace the bedroom by an open sky court.
- 11-** Extend Family living room and the toilet.
- 12-** Extend the bedroom.

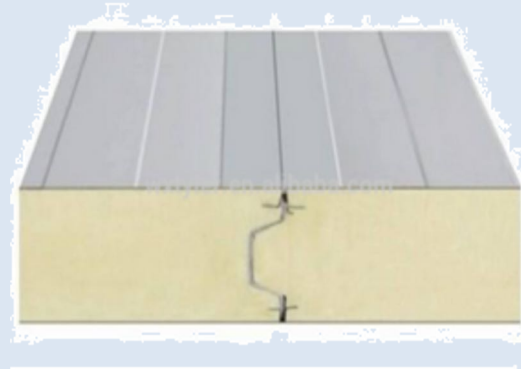


Sustainable Construction System

a) Adaptive Wall system

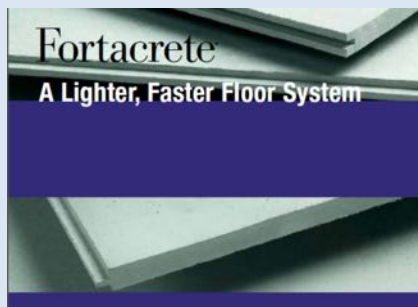


Ruukki wall panel

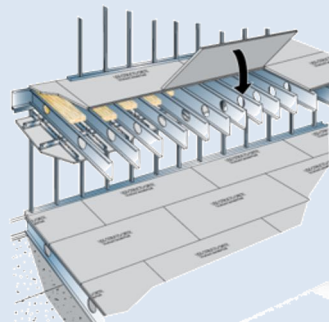


prime quality wall panel

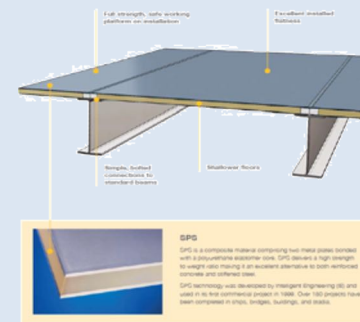
b) Adaptive Roof and floor systems



Fortacrete structural floor panel

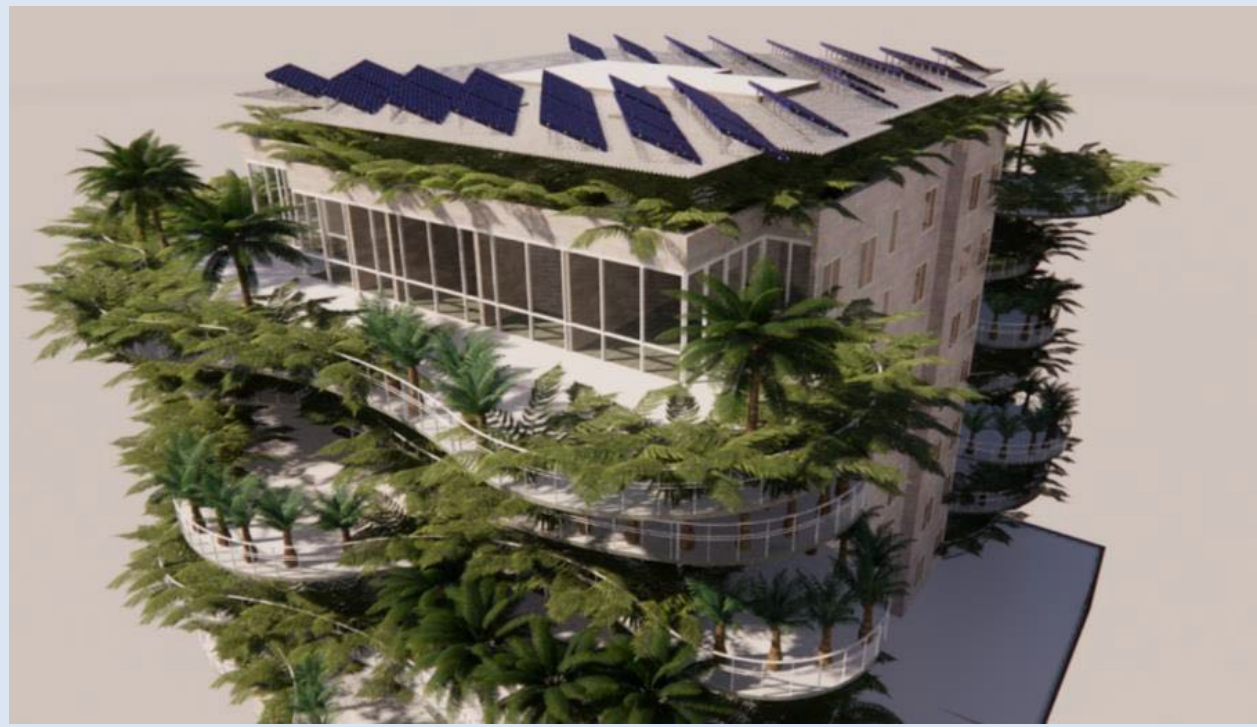


USG STRUCTO-CRETE
structural floor panel



SPS structural floor panel

Future
Approach:
Vertical Urban
Farming



Thank You 😊

