



Tarlac State University  
College of Architecture and Fine Arts  
2nd Semester, AY 2020-2021



# **Architectural Design 2**

## **COMPLEX RESIDENTIAL DESIGN:**

### **APARTMENT**

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## **Part I**

### **INTRODUCTION, STATEMENT OF THE PROBLEM, AND PROJECT OBJECTIVES**

#### **INTRODUCTION**

Apartments have long comprised an important component of the nation's housing stock. Divided into several separate dwellings, an apartment is a residential structure and a private residence in a building or house that is designed for families renting for shelter. It is typically managed by a landlord who owns and leases the property. With different amenities and the close proximity of neighbors that gives a sense of security are some of the factors that people consider upon renting or buying a property, which apartments have. This communal style of living can appeal to people who prefers to live independently.

People in downtown areas in many cities tend to move in the suburbs, and as they do, the best option is an apartment complex. With the convenience these complexes offer, along with all the perks and amenities, people have been eyeing apartments. To further understand and gain more knowledge about apartments, this study will help us find out more about the basic architectural structures of this type of dwelling.

#### **STATEMENT OF THE PROBLEM**

An efficient and effective way in solving the growing population in urban areas is through communal housing such as dormitories, condominiums, and apartment buildings. For this design problem, the apartment building will serve as a great space of communal living.

The design of the apartment block will focus on the needs and comfort of the tenants and visitors thus creating an encouraging social space with a more compact and good-natured living conditions.

#### **PROJECT OBJECTIVES**

1. To promote fair housing opportunity for residents in all neighborhoods.
2. To encourage community and urban livability.
3. To provide amenities that support the city's aspect of tourism.

## **PART II**

### **GENERAL INFORMATION AND DESIGN ABOUT APARTMENT BUILDING**

An apartment is an American term which is used to refer to a self-contained housing unit which is a type of residential real estate occupying only part of a building. An apartment can be owned by an owner or an occupier on lease or rent. An apartment can have any number of bedrooms and can be furnished or unfurnished. Most apartments in India have a penthouse and other services like the laundry, parking, air conditioner, Television cable and so on. Apartment is further divided into many other parts of housing.

Apartments are usually a single level individual dwelling unit that is often contained in a multi-unit building or development. Apartment buildings are those structures containing three or more living units with independent cooking and bathroom facilities, whether designated as apartment houses, condominiums, or garden apartments. Apartments differ from multi-unit residential occupancies that are not considered homes, such as hotels and boarding homes, by the provision of individual cooking facilities, the number of sleeping rooms, and the less transient nature of the occupants.

For centuries, apartment buildings have existed. Because of urban congestion, the cities in Roman Empire had given way in early imperial times to the communal dwelling except for the wealthy residences. Four stories were common, and six-, seven-, or eight-story buildings were occasionally constructed. Another type of apartment existed in Europe in the Middle Ages which consists a great house or mansion is divided into smaller sets of rooms for the house servants and other retainers of an important person. Contrasting to these apartments, which were simply personal suites within great houses, the apartment house as it is known today first appeared in Paris and other large European cities in the 18th century, when tall blocks of flats for middle-class tenants began appearing. In the typical Parisian apartment building, the size of the apartments and the financial means of the tenants decreased with each successive story in a four- or five-story building.

Emerged in the early 20<sup>th</sup> century are the modern large apartment buildings with the incorporation of elevators, central [heating](#), and other conveniences that could be shared in common by a building's tenants. The modern large apartment building emerged in the early 20th century Apartments for the well-to-do began to offer other amenities such as leisure facilities, delivery and laundry services, and communal dining rooms and gardens. The multistory apartment house continued to grow in importance as crowding and rising land values in cities made one-family homes less and less practicable in parts of many cities. Much [government-subsidized](#), or public, housing has taken the form of apartment buildings, particularly for the urban elderly and working classes or those living in poverty. Apartment-block towers also were erected in large numbers in the [Soviet Union](#) and other countries where housing construction was the responsibility of the state.

## **PART III**

### **CASE STUDY OF APARTMENTS IN OTHER COUNTRY**

#### **CASE STUDY 1**

Kanchenjunga Apartments

Location: India, Mumbai, Cumballa Hill

Height: 84 Metres

Floor: 27

Material: Concrete

Architectural Style: Modern Brutalism

Architect: Charles Corea

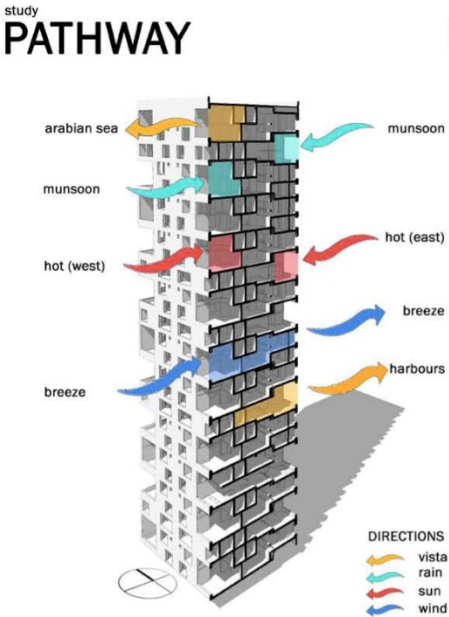
Associate Structure Engineer: Shirish Patel & Association Construction Pvt.Ltd.

The Kanchenjunga Apartments stood as a tall, square tower designed with gaps on its edges where the two floors high loggias are created to keep out the heat of the sun and take in the coolness of the sea breeze. The building is located south-west of downtown in Mumbai, India wherein buildings are ideally oriented east west to take advantage of the view of Arabian Sea on one side and the harbor on the other; thus, also having both the direction of the sun and heavy rain.

The building is 32 stories high made with reinforced concrete with 6.3m cantilevered terrace garden and a 7.8 x 6.9-meter center core that house the lifts and service area. Its individual approach has a separate road that relates to the main road and is approachable from two opposite sides, one from east and one from the west.



Its center core also serves as the main structural element in resisting lateral loads and is constructed ahead the main structure using the ‘slip method’. The opening up of the apartments also happens in the center core for vertical transport--which differentiates the building from the architect’s inspiration of concept, the Unite D habitation of Le Corb, wherein the building has an opening up using horizontal corridors.





For the concept, the architect mainly worked on sectional displacement by bringing changes in the floor surfaces. He also applied cellular planning by using interlocks in one and half story 3- and 4-bedroom units with two and half story 5–6-bedroom units. He also applied small displacements in levels to differentiate the external earth-filled terraces and the internal elevated volumes.



The Kanchenjunga Apartments also serves as a direct response to the present culture, urbanization, and climatic conditions for the region. Thus, applying its concrete construction and large areas of white panels to resemble modern apartment buildings in the West, but having a modern interpretation of traditional Indian bungalow through its garden terraces. Also, the application of colors yellow and red reflects the quality of sunlight, climate, and culture influence in India and other Asian countries.



## **Case Study 2**

Crosswinds Apartments

Location: Hyderabad, India

Landscape Design: Earthworks

Area: 8300.0 M2

Architects: VSDP

Structural Engineer: Pase Group

Project Year: 2009

The design of the Crosswinds Apartments tends to maximize the view through open spaces to establish a dynamic landscape. The buildings are seen as vertical extrusions and its natural contours have not been altered. The planning of the apartments was made in a linear central core for interaction, wherein the living room, dining, and bedrooms were aligned on either side of the core. The linear core is also attached with a large balcony that let the user enjoy the view of the city.



**TYPICAL FLOOR PLAN:**



The location of the building has a tropical wet and dry climate, thus, solutioned with a cross ventilation wherein the building lets the air be drawn into the high-pressure windward side

and then drawn out on the low-pressure leeward side. This solution helps in moderating internal temperature, reducing accumulation of moisture, odors, and gases that can happen during crowded events, and creating air movement to offer comfort to the occupants.

The problem for climate was also solutioned with application of water bodies such as ponds, streams, and cascades since water absorbs a lot of heat and contributes a lot for evaporative cooling.





### Case Study 3

#### Yamuna Apartments

Location: Alaknanda Don Bosco Rd, Greater Kailash II, Alaknanda, New Delhi, Delhi 110019, India

Architect: Ranjit Sabikhi

Yamuna Apartments was built for lower middle-income group. The site measures 4.25 acres, and due to planning regulations, 0.5 acres was left as an open space at the north east corner with the intention of forming a continuous green space with adjoining residential complex which served as a playground.

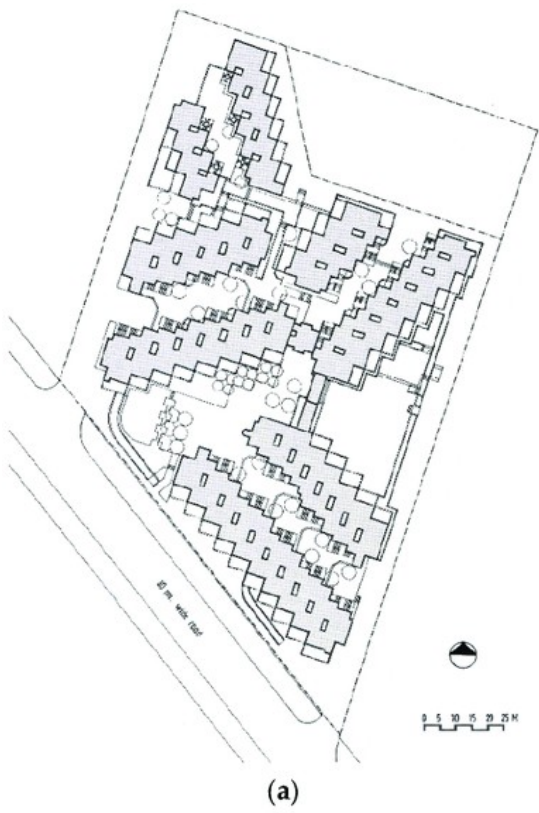
The design concept of the building results in a solution of being an integral community settlement to a society that consists of 200 members. It revolves around building a typical Indian village with its lively narrow galis or pedestrian streets to serve as a bridge for interaction of the people while doing their household chores. This is solutioned by designing a traffic free complex, where the vehicular traffic is restricted in the basement and to the periphery. The galis

was converge on an asymmetrically placed central square where recreational activities have been placed.



The traditional design elements are also applied in the building such as balconies for shading the external wall surface, courtyards and terraces for outdoor sleeping in the summer, and the establishment of open and enclosed spaces for private and semi-private areas.

The plan of the unit consists of opening on two sides to enable cross ventilation. Each unit is sheltered with balcony, or terrace which provides space for outdoor activities, which also gives an access to the sky by leaving it open and by changing the shape from square to rectangle on alternate floors.



#### PART IV

#### LOCAL LAWS ENACTED FOR APARTMENT DESIGNS

**REVISED RULES AND REGULATIONS IMPLEMENTING THE SUBDIVISION AND  
CONDOMINIUM BUYER'S PROTECTIVE DECREE (PD 957) AND OTHER RELATED  
LAWS**

**Planning Considerations**

Area Planning Planning and designing of subdivision projects shall take into account the following:

- a. safety and general welfare of the future occupants;
- b. adequate, safe, efficient and integrative road circulation system servicing every lot therein;
- c. judicious allocation of land uses for diversity and amenity;
- d. preservation of site e. proper siting or orientation of lots;
- f. harmony with existing and proposed development in the vicinity;
- g. Application of workable design principles or parameters for a well planned and self-sustaining environment

**Site Preservation**

- a. Slope The finished grade shall have a desired slope to allow rain water to be channeled into street drains. Where cut and fill is necessary, an appropriate grade shall be attained to prevent any depression in the area. Grading and ditching shall be executed in a manner that will prevent erosion or flooding of adjoining properties.
- b. Preservation of Site Assets Suitable trees with a caliper diameter of 200 millimetres or more, shrubs and desirable ground cover per Department of Environment and Natural Resources (DENR) rules shall be preserved. Where a good quality top soil exists in the site, it shall be banked and shall be preserved for finishing grades of yards, playgrounds, parks and garden area.
- c. Ground Cover Grass, shrubs, plants and other landscaping materials used for ground cover shall be of a variety appropriate for its intended use and location. They shall be planted so as to allow well-tended cover of the area.

## **Circulation**

Depending on the classification of roads adjacent to the subdivision and the size of the project site, road network should result into a hierarchy of functions and should define and serve the subdivision as one integrated unit.

- a. Roads complemented with pathwalks within the subdivision must be so aligned to facilitate movement and to link the subdivision to the nearest major transportation route and/or adjacent property. Whenever there are existing roads within the project site which shall be made part of the subdivision plan, these shall be improved in accordance with the standards set forth herein.
- b. Streets should conform to the contours of the land as far as practicable Where a proposed project adjoins a developed property, roads within the said project shall be connected/integrated/aligned with existing ones. Where a proposed project adjoins undeveloped property, a provision for future connection shall be mandatory.
- c. As far as practicable, streets shall be laid out at right angles to minimize critical intersections such as blind corners, skew junction, etc.
- d. Roads shall conform to sound engineering practices.

## **Yard/Setback**

The minimum setback of dwelling units both for open market and medium cost housing projects shall conform to the National Building Code of the Philippines.

## **Floor Area Requirements**

### **a. Single-Occupancy Unit**

Single occupancy units shall have a minimum floor area of 18 square meters, however, a net floor area of 12 square meters may be allowed provided that:

- a.1 These are intended for students/employees/workers and provided further that the condominium project to which these will be integrated is within highly urbanized areas.

a.2 The same shall be provided with common basic facilities such as laundry/drying area and support amenities such as visitor's lounge and dining area.

a.3 Said facilities/support amenities including all other measures that will ensure compliance with the intended use of the unit shall be explicitly indicated in the master deed/ contract to sell.

b. Family Dwelling Unit The minimum floor area of family condominium units shall be 36 square meters and 22 square meters for open market and medium cost condominium project respectively.

### **Firewall**

Any wall which subdivides a building so as to resist the spread of fire, by starting at the foundation and extending continuously through all storeys to, or above the roof. Extension above the roof is 1 millimeter.

**FIREWALL PROVISIONS (HIGHLIGHTED AND ANNOTATED) FOR ALL  
RESIDENTIAL CLASSIFICATIONS UNDER P.D. NO. 1096, THE 1977 NBCP IN ITS  
2004 REVISED IRR SECTION 704. LOCATION ON PROPERTY**

#### 4. Building Footprint and Firewall Requirements

a. The following rules shall be observed in the determination of the Allowable Maximum Building Footprint (AMBF) for buildings and related habitable structures. If the stated rules are compared with (1) Rule VIII Table VIII.1.- Reference Table on Percentage of Site Occupancy and Maximum Allowable Construction Area (MACA); (2) Rule VIII Tables VIII.2. and VIII.3. (setbacks, yards and courts); or (3) with the applicable stipulations under this rule and with the applicable stipulations of the fire code, the more stringent but applicable regulation out of the aforementioned rules should be observed;

b. If without a firewall, the footprint of a proposed building/structure shall be measured horizontally from the property line to the outermost faces of the exterior walls of the building/structure; Provided, that the distance measured from the property line shall conform with the applicable stipulations of this Rule and Rule VIII; The resultant area established at grade level upon which the proposed building/structure may stand shall be the AMBF;

##### c. Footprint Based on Firewall Provisions

i. If with a firewall on one (1) side, the footprint of a proposed building/structure shall be measured horizontally from the property line with a firewall to the outermost faces of the opposite exterior walls of the building/structure; provided, that the applicable stipulations of the fire code are strictly followed;

ii. If with a firewall on two (2) sides or on one (1) side and the rear property line, the footprint of a proposed building/structure shall be measured horizontally from the opposing property lines in case of a firewall on two (2) sides or from the rear property line with a firewall to the outermost faces of the opposite exterior walls of the building/structure; provided, that the applicable stipulations of the fire code are strictly followed;

iii. Absolutely no firewalls are allowed for a low density residential (r-1) uses or occupancies; an abutment of up to 3.20 meters from established grade level may however be permitted but solely for the purpose of supporting a carport roof; provided further that such abutment shall be constructed of perforated or decorative concrete blocks above 1.50 meters measured vertically

from the established grade level; such an abutment shall not be longer than 7.00 meters or 50% of the side property line in total length, whichever is shorter.

**Annotation:** If single-detached dwellings are missing (or have fully enclosed) their rear yards (or have encroached on portions of either or both the side yards or either or both the rear and front yard or of all yards or of any part of the road right-of-way (RROW) or of the mandated legal easement (LE), then there is non-compliance i.e. a violation of the R-1 dwelling concept defined in the NBCP and in HLURB issuances

iv. For medium density residential (r-2) uses or occupancies, a firewall can be erected on a maximum of 80% of the total length of a side property line; provided that only one (1) side property line is used for a firewall in the case of a r-2 structure; and provided further that the applicable stipulations of the fire code are strictly followed;

**Annotation:** If single-attached i.e. zero lot line dwellings or duplexes are missing (or have fully enclosed) their rear yards (or have encroached on portions of either or both the rear and front yard and one (1) side yard or of any part of the RROW or of the mandated LE, then there is non-compliance i.e. an apparent violation of the R-2 dwelling concept defined in the NBCP and in HLURB issuances.

v. For high-density residential (R-3) uses or occupancies, two (2) types of firewall construction may be permitted:

(a) for a r-3 use or occupancy with a firewall on two (2) sides, a firewall can be erected on a maximum of 85% of the total length of each side property line; provided that all firewall construction shall not exceed 65% of the total perimeter of the R-3 property, i.e., total length of all property lines; provided that firewalls in r-3 lots shall only be allowed for a maximum two (2) storey component structure; and provided further that all the applicable stipulations of the fire code are strictly followed; and

(b) for a r-3 use or occupancy with a firewall on one (1) side property line and at the rear property line, a firewall can be erected on a maximum OF 90% OF THE TOTAL LENGTH OF the side and rear property lines and up to 100% in case the rear property line is only 4.00 meters wide; provided that all firewall construction at the side property lines shall not exceed 50% of the

total perimeter of the r-3 property, i.e., total length of all property lines; provided that firewalls in r-3 lots shall only be allowed for a maximum two (2) storey structure but not at the rear property line where the maximum allowed firewall height shall only be 3.20 meters measured vertically from established grade; and provided further that all the applicable stipulations of the fire code are strictly followed.

**Annotation:** If rowhouses are missing (or have fully enclosed) their rear yards (or have encroached on portions of either or both the rear and front yard or of any part of the RROW or of the mandated LE, then there is non-compliance i.e. an apparent violation of the R-3 dwelling concept defined in the NBCP and in HLURB issuances.

vi. For townhouse residential (r-4) uses or occupancies, firewalls on the two (2) sides of each townhouse unit may be permitted; the r-4 firewall can be erected on a maximum of 85% of the total length of each side property line; provided that all firewall construction shall not exceed 50% of the total perimeter of each r-4 property, i.e., total length of all property lines; provided that firewalls in each r-4 use or occupancy shall be allowed for a maximum three (3) storey structure; and provided further that all the applicable stipulations of the fire code are strictly followed;

**Annotation:** If townhouses are missing (or have fully enclosed) their rear yards (or have encroached on portions of either or both the rear and front yard or of any part of the RROW or of the mandated LE, then there is non-compliance i.e. an apparent violation of the R-4 dwelling concept defined in the NBCP and in HLURB issuances.

vii. For residential condominium (R-5) uses or occupancies, two (2) types of firewall construction may be permitted:

(A) for a r-5 use or occupancy with a firewall on two (2) sides, a firewall can be erected on a maximum of 75% of the total length of each side property line; provided that all firewall construction at the side property lines shall not exceed 50% of the total perimeter of the R-5 property, i.e., total length of all property lines; provided that side firewalls in R-5 uses or occupancies shall only be allowed for a maximum eight (8) storey component structure, i.e., the

podium; and provided further that all the applicable stipulations of the fire code are strictly followed; and

**Annotation:** The 8 storeys represent a full 24.0 meter (m) tall podium component (which may contain above-grade parking facilities). If a deck roof is introduced, a 1.0 meter tall masonry parapet wall or a metal railing or a combination thereof i.e. At a maximum total height of 1.0 m above the finished floor of the deck level, could be added but that this parapet wall shall NOT be mounted atop the firewall BUT instead set back at a distance of 0.75 m from the abutted property line.

(b) For a R-5 use or occupancy with a firewall on one (1) side and at the rear property line, a firewall can be erected on a maximum of 65% of the total length of the side property line and on a maximum of 50% of the total length of the rear property line; provided that all firewall construction shall not exceed 60% of the total perimeter of the R-5 property, i.e., total length of all property lines; provided that the side firewalls in r-5 uses or occupancies shall only be allowed for a maximum eight (8) storey component structure and that at the rear property line, the maximum allowed firewall height shall only be 14.00 meters measured vertically from established grade; and provided further that all the applicable stipulations of the fire code are strictly followed.

**Annotation:** The 14.0 m represents a 4.67 storey podium component (which may contain above-grade parking facilities). If a deck roof is introduced, a 1.0 meter tall masonry parapet wall or a metal railing or a combination thereof i.e. At a maximum total height of 1.0 m above the finished floor of the deck level, could be added but that this parapet wall shall NOT be mounted atop the firewall BUT instead set back at a distance of 0.75 m from the abutted property line.

Additionally, if residential condominium buildings are missing (or have fully enclosed) their rear yards (or have encroached on portions of either or both the rear and front yard or of any part of the RROW or of the mandated LE, then there is non-compliance i.e. An apparent violation of the R-5 dwelling concept defined in the NBCP and possibly in HLURB issuances as well.

viii. All existing openings on all firewalls shall be sealed completely to maintain the fire integrity of adjoining buildings/structures.

ix. The provision of a fully functional sprinkler system and the installation of other fire-retardant or fire suppression devices in the case of commercial, institutional and industrial buildings/structures may allow firewall construction for up to 70% of the total perimeter of the property lines provided that the prescribed setbacks, yards and courts fronting the road right-of-way (RROW) are first fully complied with; and provided further that all the applicable stipulations of the fire code, particularly on the number, type and locations of fire exits are strictly followed.

## **PART V**

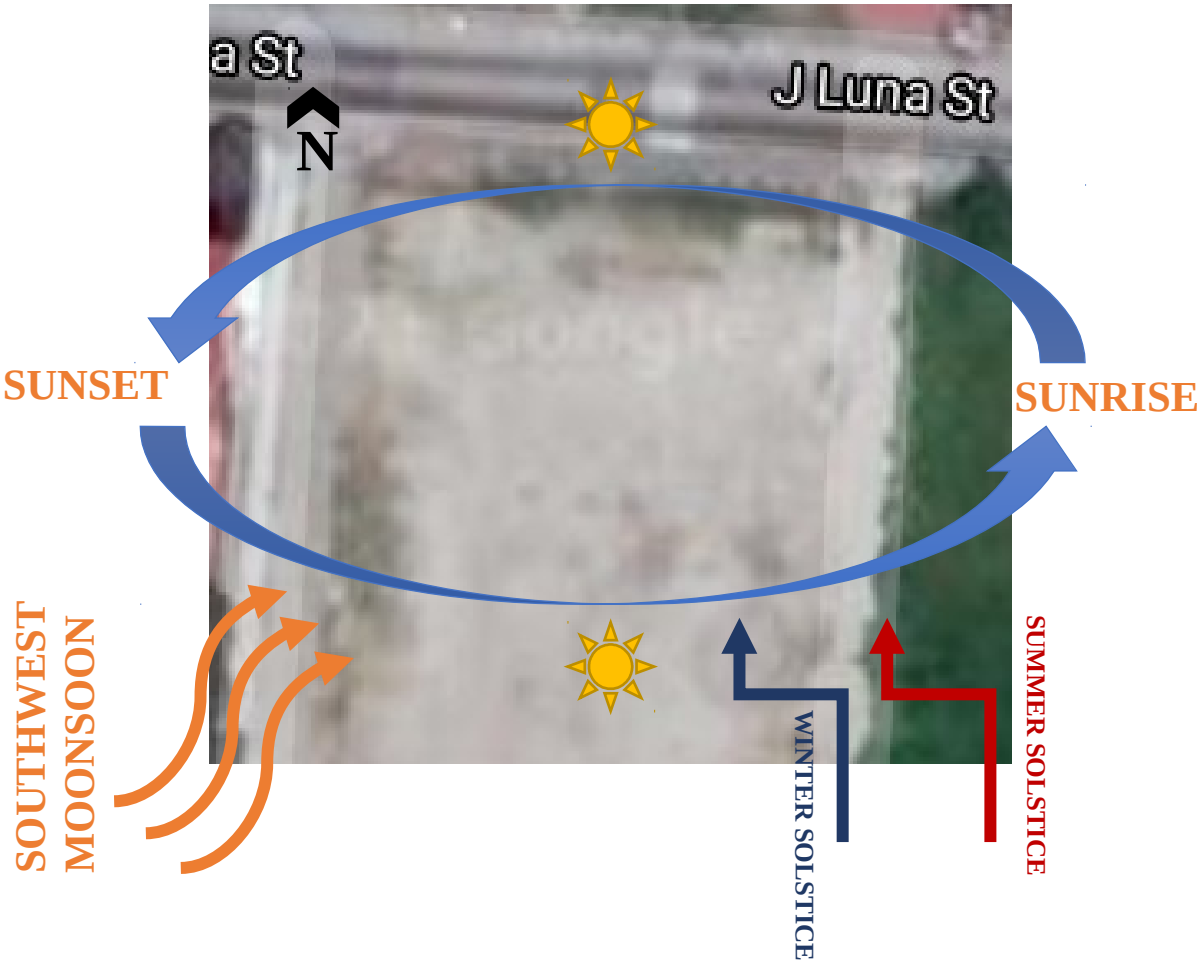
### **SITE ANALYSIS, BUBBLE & MATRIX DIAGRAM, AND SPACE PROGRAMMING**

#### **The Site**

The proposed site is located at downtown Tarlac City along Juan Luna St. The site is relatively flat inside and has an area of 4879 square meters. The location is fronting one of the frequently traffic congested road in Tarlac City. It sits between two educational institutions and is about 120m away from MacArthur Highway.

Flood is one of the major problems according to the people who lives around the site because some of the drainages are filled with garbage that blocks the flow of water. The site is also exposed to loud noise of vehicles and air pollution because it is located along the highway. Traffic congestion is also a problem caused by schools close to it, food establishments and mall. Another thing is, the muddy type of soil where it is bad for vegetation and for building structures.

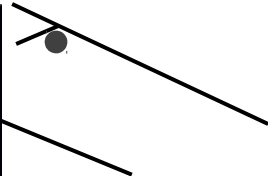
Site Analysis



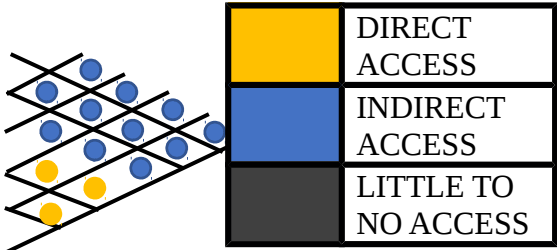
MATRIX DIAGRAM

Part I: UNIT

|             |
|-------------|
| BEDROOM 1   |
| BEDROOM 2   |
| T&B         |
| DINING AREA |
| KITCHEN     |
| LIVING AREA |

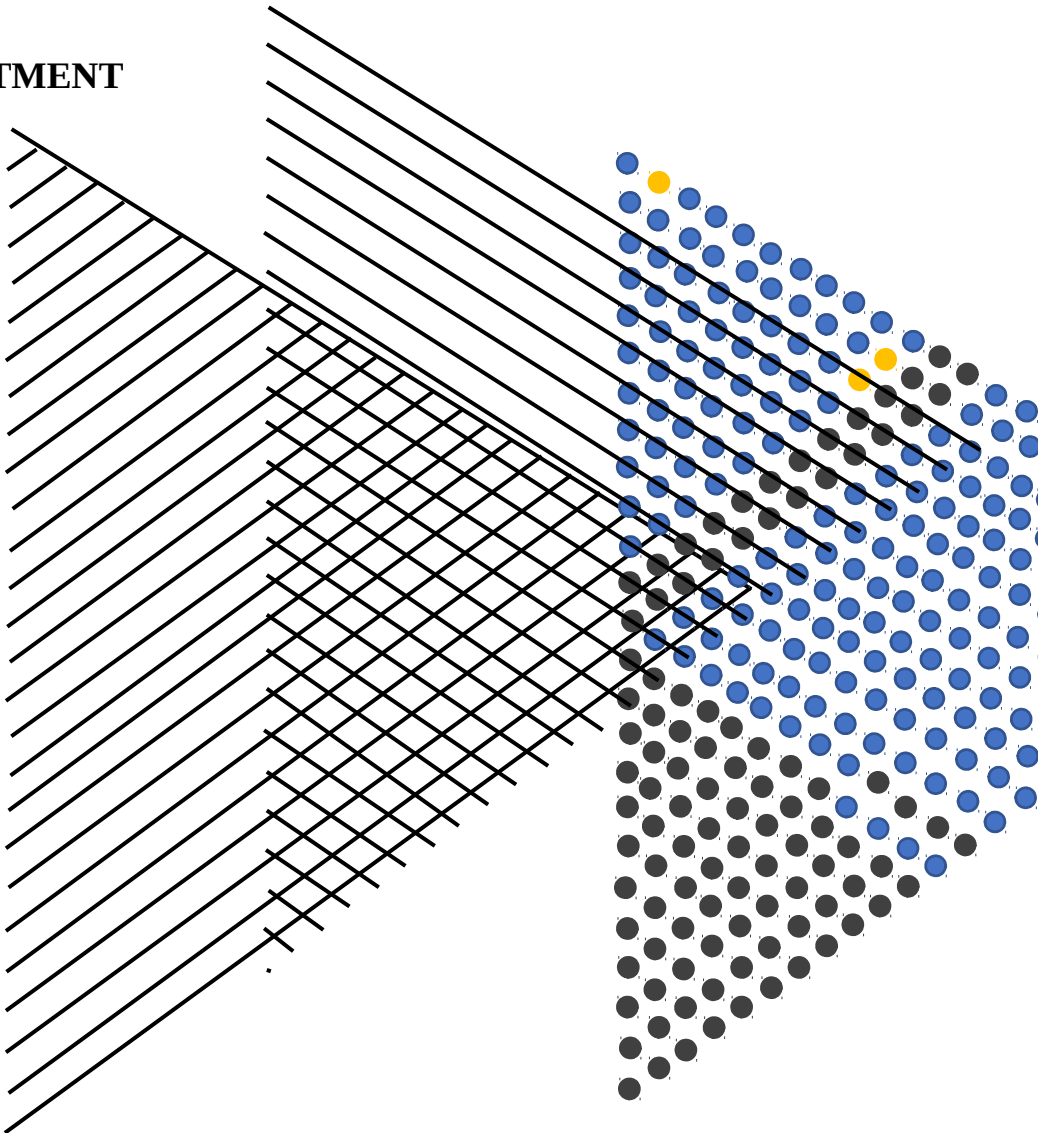


LEGENDS:



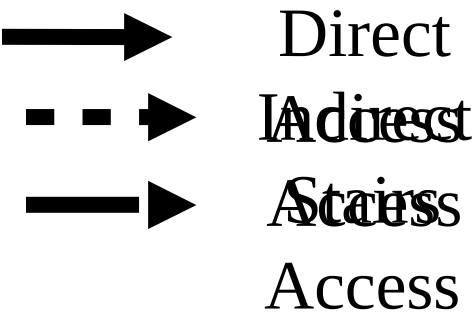
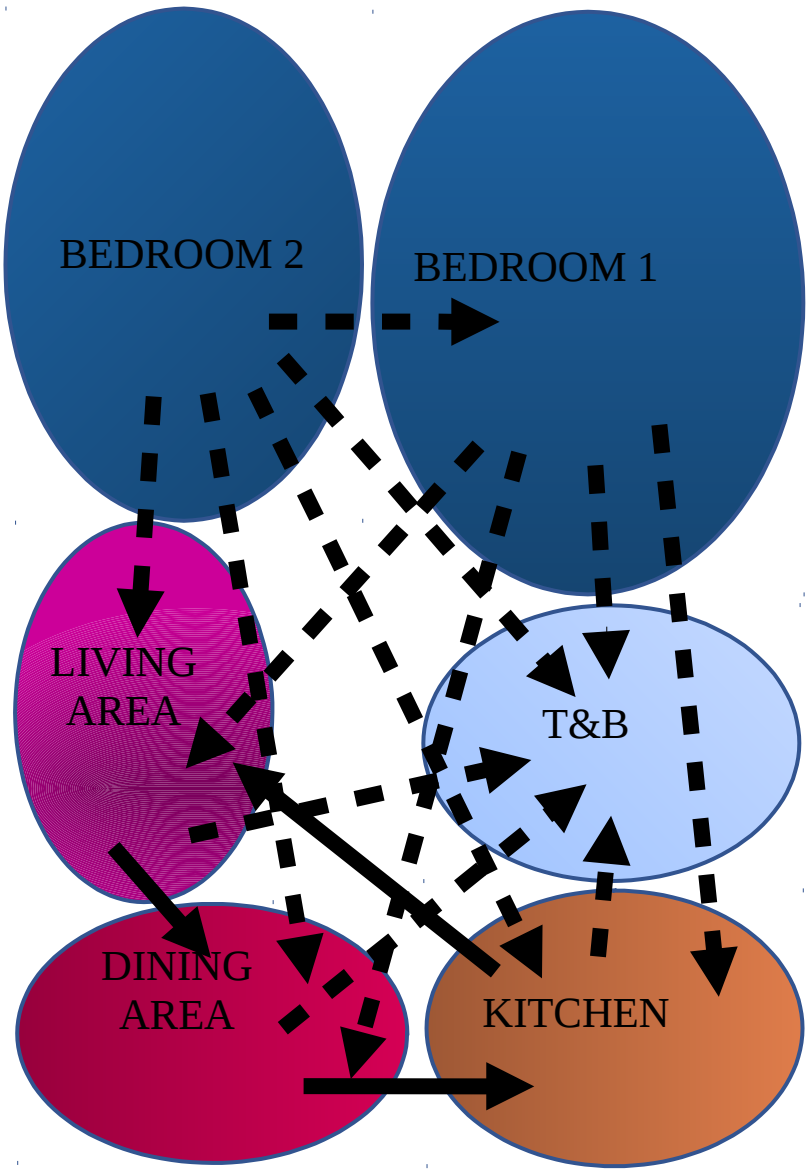
Part II: APARTMENT

|                     |
|---------------------|
| SWIMMING POOL       |
| LOBBY               |
| GARDEN              |
| LAUNDRY SHOP 1      |
| LAUNDRY SHOP 2      |
| CAFÉ 1              |
| CAFÉ 2              |
| LIBRARY             |
| JANITOR’S CLOSET    |
| POWDER ROOM 1       |
| POWDER ROOM 2       |
| PARKING AREA        |
| COMMUNITY BALCONY 1 |
| COMMUNITY BALCONY 2 |
| UNIT 1              |
| UNIT 2              |
| UNIT 3              |
| UNIT 4              |
| UNIT 5              |
| UNIT 6              |
| UNIT 7              |
| UNIT 8              |
| UNIT 9              |
| UNIT 10             |
| UNIT 11             |
| UNIT 12             |



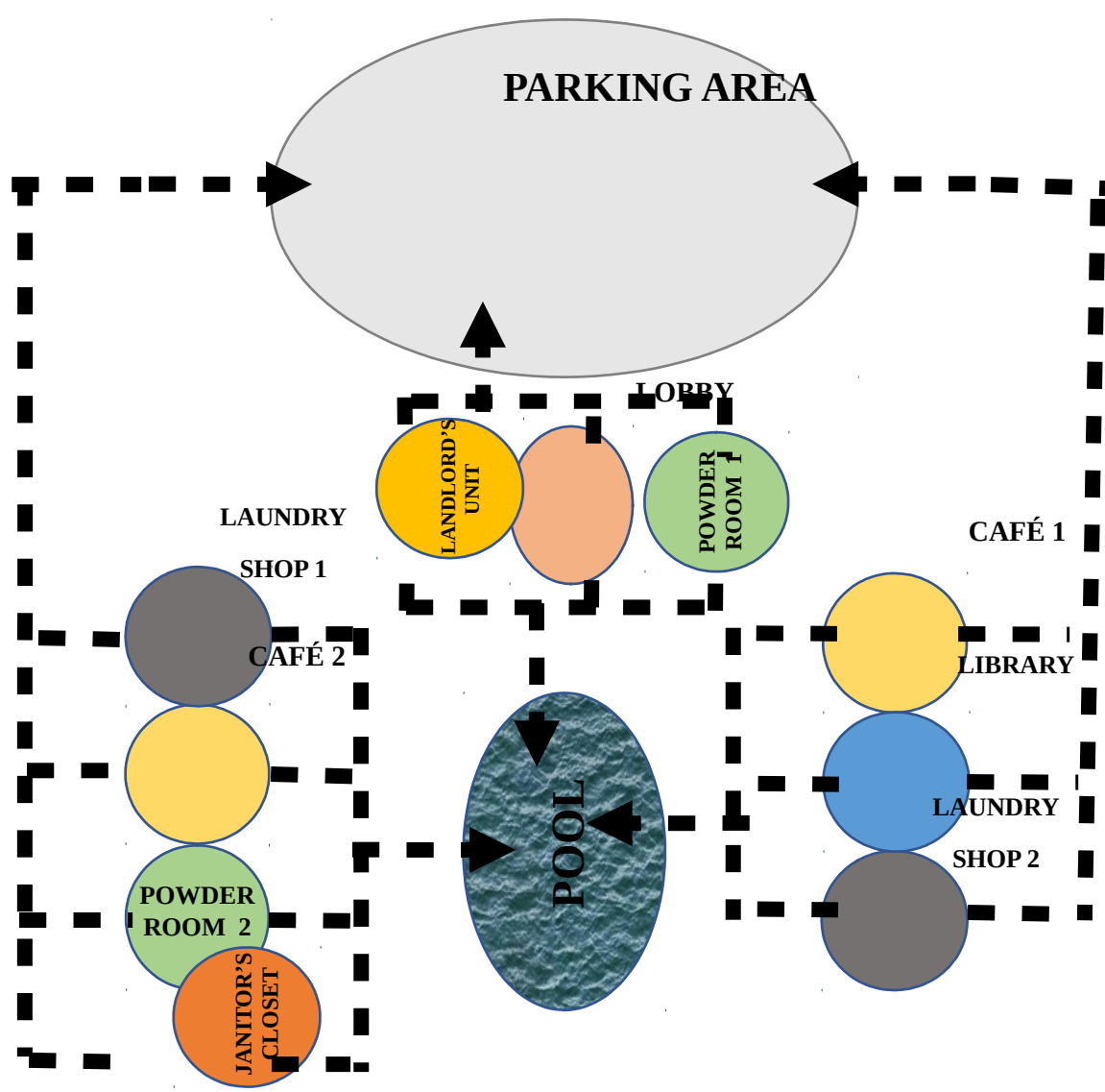
BUBBLE DIAGRAM

Part I: UNIT

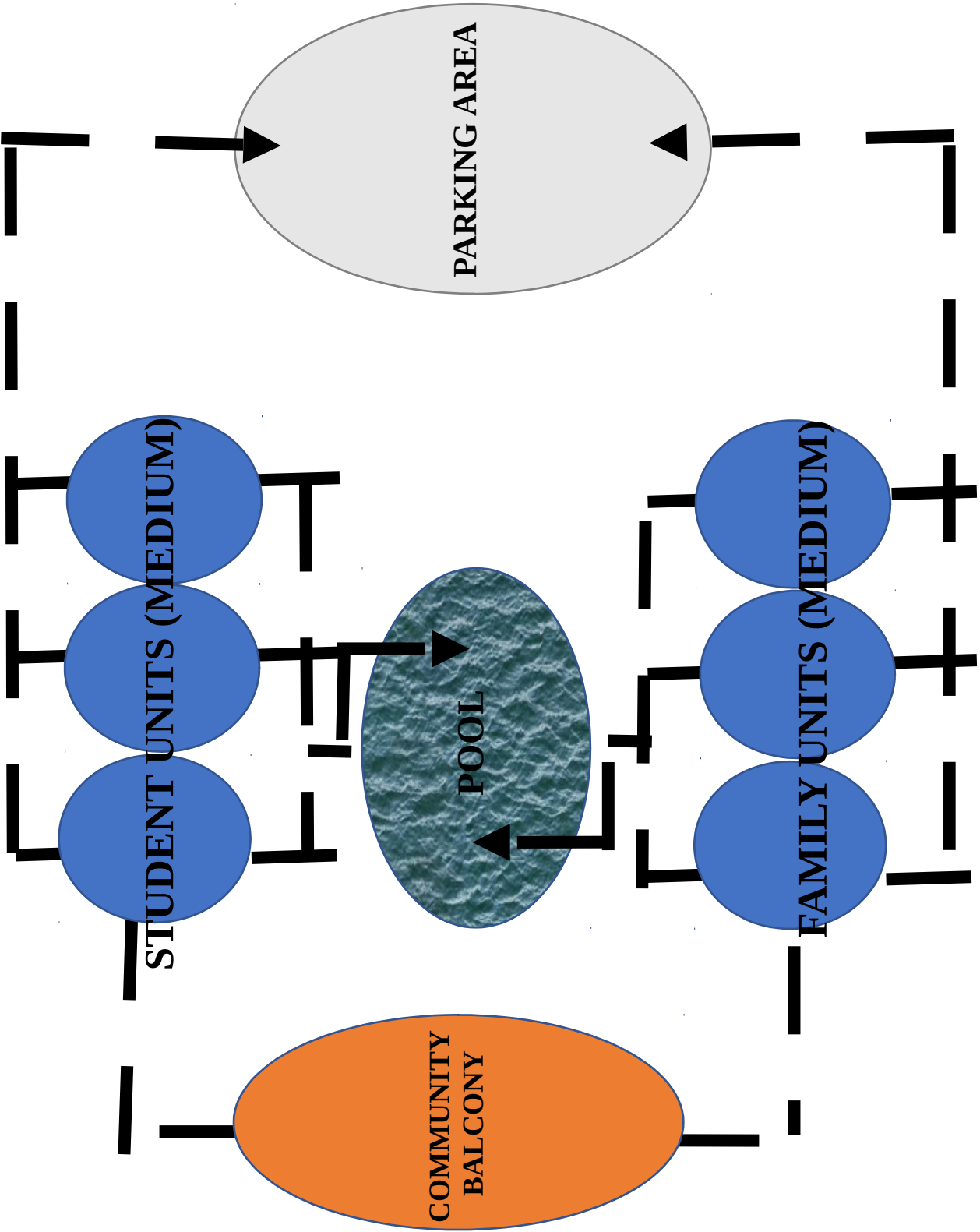


Part II: APARTMENT

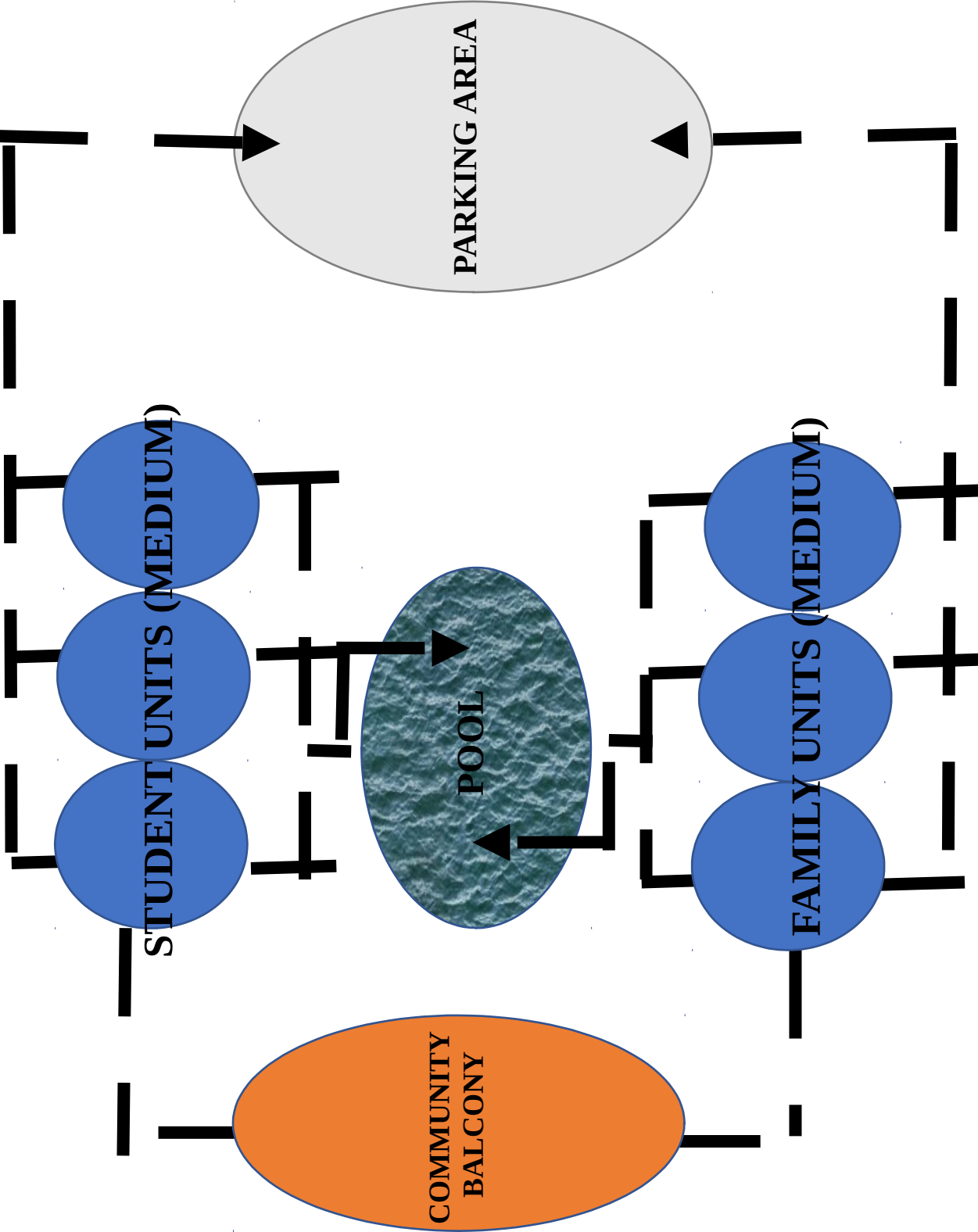
Ground Floor



2nd Floor



3rd Floor



SPACE  
PROGRA  
MMING

| OVERALL AREA            |        |
|-------------------------|--------|
| Name                    | Total  |
| Student Unit – (Medium) | 49.17  |
| Family Unit – (Medium)  | 49.38  |
| Lobby                   | 39.07  |
| Laundry Shop 1          | 42.43  |
| Laundry Shop 2          | 42.43  |
| Landlord’s Unit         | 52.19  |
| Janitor’s Closet        | 15.7   |
| Café 1                  | 39.31  |
| Café 2                  | 39.31  |
| Library                 | 38.18  |
| Powder Room 1           | 2.81   |
| Powder Room 2           | 2.81   |
| Balcony                 | 32.9   |
| Parking Area            | 331.5  |
|                         | 777.19 |

# STUDENT UNIT (MEDIUM)

# FAMILY UNIT (MEDIUM)

LANDLORD'S UNIT

| SPACE PROGRAMMING |                     |              |                 |         |                     |                |      |           |           |         |                       |       |
|-------------------|---------------------|--------------|-----------------|---------|---------------------|----------------|------|-----------|-----------|---------|-----------------------|-------|
| Landlord's Unit   |                     |              |                 |         |                     |                |      |           |           |         |                       |       |
| Room              | Function            | No. of Users | Area Per Person | Total A | Furnitures/Fixtures | Area           | Qty. | Total B.1 | Total B.2 | Total C | Circulation Space 30% | Total |
| Living Room       | Hospitality         |              |                 |         | Tv Console          | 0.48 (6x.8)    | 1    | 0.48      |           |         |                       |       |
|                   | Receiving guests    |              |                 |         | Plant box           | 0.25 (5x.5)    | 1    | 0.25      |           |         |                       |       |
|                   | Entertainment       | 4            | 1.5             | 6       | Chair               | 0.33 (7.5x.90) | 2    | 1.36      | 3.98      | 9.98    | 2.99                  | 12.97 |
|                   | Relaxation          |              |                 |         | Sofa                | 0.33 (8x.75)   | 1    | 1.35      |           |         |                       |       |
|                   |                     |              |                 |         | Coffee Table        | 0.33 (6x.60)   | 1    | 0.54      |           |         |                       |       |
| Kitchen           | Cooking             |              |                 |         | Range               | 0.33 (65x.6)   | 1    | 0.39      |           |         |                       |       |
|                   | Baking              | 2            | 1.5             | 3       | Sink                | 0.6 (1x.6)     | 1    | 0.6       | 1.38      | 4.38    | 1.31                  | 5.69  |
|                   | Preparation of food |              |                 |         | Refrigerator        | 0.33 (65x.6)   | 1    | 0.39      |           |         |                       |       |
|                   |                     |              |                 |         | Dining table        | 1.2 (6x.6)     | 1    | 1.2       |           |         |                       |       |
| Dining Area       | Meal                | 4            | 1.5             | 6       | Dining chairs       | 0.2 (4x.2)     | 4    | 0.8       | 2         | 8       | 2.4                   | 10.4  |
|                   | Dine                |              |                 |         | Plant box           | 0.25 (5x.5)    | 1    | 0.25      |           |         |                       |       |
| Bedroom 1         | Rest                |              |                 |         | Bed side table      | 0.16 (40x.40)  | 1    | 0.16      |           |         |                       |       |
|                   | Relaxation          |              |                 |         | Bed                 | 2.66 (1.9x1.4) | 1    | 2.66      | 5.37      | 8.37    | 2.51                  | 10.88 |
|                   | Sleep               | 2            | 1.5             | 3       | Cabinet             | 0.72 (60x1.2)  | 1    | 0.72      |           |         |                       |       |
|                   | Study               |              |                 |         | Study table         | 0.3 (3x.3)     | 1    | 0.9       |           |         |                       |       |
|                   |                     |              |                 |         | Chair               | 0.33 (75x.90)  | 1    | 0.68      |           |         |                       |       |
| Bedroom 2         | Rest                |              |                 |         | Bed                 | 1.72 (1.9x.91) | 1    | 1.72      |           |         |                       |       |
|                   | Relaxation          | 1            | 1.5             | 1.5     | Cabinet             | 0.72 (60x1.2)  | 1    | 0.72      | 2.6       | 4.1     | 1.23                  | 5.33  |
|                   | Sleep               |              |                 |         | Bed side table      | 0.16 (40x.40)  | 1    | 0.16      |           |         |                       |       |
| Toilet and Bath   | Bath                |              |                 |         | Water closet        | 0.36 (6x.6)    | 1    | 0.36      |           |         |                       |       |
|                   | Sanitary            | 1            | 1.5             | 1.5     | Lavatory            | 0.3 (5x.6)     | 1    | 0.3       | 1.66      | 3.16    | 0.95                  | 4.11  |
|                   | Waste disposal      |              |                 |         | Shower area         | 1 (1x1)        | 1    | 1         |           |         |                       |       |
| Powder Room       | Sanitary            | 1            | 1.5             | 1.5     | Water closet        | 0.36 (6x.6)    | 1    | 0.36      | 0.66      | 2.16    | 0.65                  | 2.81  |
|                   | Waste disposal      |              |                 |         | Lavatory            | 0.3 (5x.6)     | 1    | 0.3       |           |         |                       | 52.19 |

| SPACE PROGRAMMING   |                                  |              |                 |         |                    |                |      |           |           |         |
|---------------------|----------------------------------|--------------|-----------------|---------|--------------------|----------------|------|-----------|-----------|---------|
| Janitor's Room      |                                  |              |                 |         |                    |                |      |           |           |         |
| Room                | Function                         | No. of Users | Area Per Person | Total A | Furniture/Fixtures | Area           | Qty. | Total B.1 | Total B.2 | Total C |
| Bedroom 1           | Rest                             |              |                 |         | Bed side table     | 0.16 (.40x.40) | 1    | 0.16      |           |         |
|                     | Relaxation                       | 2            | 1.5             | 3       | Bed                | 1.72 (1.9x.91) | 1    | 1.72      | 3.28      | 6.28    |
|                     | Sleep                            |              |                 |         | Cabinet            | 0.72 (.60x1.2) | 1    | 0.72      |           | 1.88    |
|                     |                                  |              |                 |         | Chair              | 0.68 (.75x.90) | 1    | 0.68      |           |         |
| Janitor's Closet    | Storage for tools and equipments | 2            | 1.5             | 3       | Toolbox            | 0.7 (.7x1)     | 1    | 0.7       |           |         |
|                     |                                  |              |                 |         | Cabinet            | 0.5 (.5x1)     | 1    | 0.5       | 2.8       | 5.8     |
|                     |                                  |              |                 |         | Janitorial Cart    | 0.8 (.8x1)     | 2    | 1.6       |           | 1.74    |
|                     |                                  |              |                 |         |                    |                |      |           |           | 15.7    |
| SPACE PROGRAMMING   |                                  |              |                 |         |                    |                |      |           |           |         |
| Powder Room         |                                  |              |                 |         |                    |                |      |           |           |         |
| Room                | Function                         | No. of Users | Area Per Person | Total A | Furniture/Fixtures | Area           | Qty. | Total B.1 | Total B.2 | Total C |
| Powder Room         | Sanitary                         | 1            | 1.5             | 1.5     | Lavatory           | 0.36 (.6x.6)   | 1    | 0.36      | 0.66      | 2.16    |
|                     | Waste Disposal                   |              |                 |         | Water Closet       | 0.3 (.5x.6)    | 1    | 0.3       |           | 0.65    |
|                     |                                  |              |                 |         |                    |                |      |           |           | 2.81    |
| SPACE PROGRAMMING   |                                  |              |                 |         |                    |                |      |           |           |         |
| Café (Ground Floor) |                                  |              |                 |         |                    |                |      |           |           |         |
| Room                | Function                         | No. of Users | Area Per Person | Total A | Furniture/Fixtures | Area           | Qty. | Total B.1 | Total B.2 | Total C |
| Café                | Meeting place                    | 15           | 1.5             | 22.5    | Serve              | 1.5 (2.5x.60)  | 1    | 1.5       |           |         |
|                     | Independent workspace            |              |                 |         | Chair              | 0.2 (.45x.45)  | 15   | 3         | 7.74      | 30.24   |
|                     |                                  |              |                 |         | Table              | 0.81 (.90x.90) | 4    | 3.24      |           | 9.07    |
|                     |                                  |              |                 |         |                    |                |      |           |           | 39.31   |

| SPACE PROGRAMMING |             |              |                 |         |                               |                 |      |           |           |         |                       |       |
|-------------------|-------------|--------------|-----------------|---------|-------------------------------|-----------------|------|-----------|-----------|---------|-----------------------|-------|
| Lobby             |             |              |                 |         |                               |                 |      |           |           |         |                       |       |
| Room              | Function    | No. of Users | Area Per Person | Total A | Furnitures/Fixtures           | Area            | Qty. | Total B.1 | Total B.2 | Total C | Circulation Space 30% | Total |
| Lobby             | Hospitality | 15           | 1.5             | 22.5    | 3 Seat Sofa                   | 1.57 (1.85x.85) | 2    | 3.14      |           |         |                       |       |
|                   | Security    |              |                 |         | Chair                         | 0.72 (.85x.85)  | 4    | 2.88      |           |         |                       |       |
|                   |             |              |                 |         | Coffee Table                  | 0.53 (.5x1.05)  | 1    | 0.53      |           |         |                       |       |
|                   |             |              |                 |         | Pedestal Table                | 0.25 (.50x.50)  | 1    | 0.25      | 7.55      | 30.05   | 9.02                  | 39.07 |
|                   |             |              |                 |         | Front Desk/Receptionist Table | 0.75 (1.5x.50)  |      | 0.75      |           |         |                       |       |
|                   |             |              |                 |         |                               |                 | 1    |           |           |         |                       |       |
|                   |             |              |                 |         |                               |                 |      |           |           |         |                       | 39.07 |

| SPACE PROGRAMMING |                        |              |                 |         |                     |                 |      |           |           |         |                       |       |
|-------------------|------------------------|--------------|-----------------|---------|---------------------|-----------------|------|-----------|-----------|---------|-----------------------|-------|
| Laundry Shop      |                        |              |                 |         |                     |                 |      |           |           |         |                       |       |
| Room              | Function               | No. of Users | Area Per Person | Total A | Furnitures/Fixtures | Area            | Qty. | Total B.1 | Total B.2 | Total C | Circulation Space 30% | Total |
| Laundry Shop      | Washing area (clothes) | 15           | 1.5             | 22.5    | Clothes Horse       | 0.45 (1.50x.30) | 2    | 0.9       |           |         |                       |       |
|                   |                        |              |                 |         | Cabinet             | 0.72 (1.2x.60)  | 1    | 0.72      |           |         |                       |       |
|                   |                        |              |                 |         | Table               | 0.4 (.80x.50)   | 2    | 0.8       |           |         |                       |       |
|                   |                        |              |                 |         | Weighing Scale      | 0.16 (.40x.40)  | 2    | 0.32      |           |         |                       |       |
|                   |                        |              |                 |         | Chairs              | 0.2 (.45x.45)   | 10   | 2         | 10.14     | 32.64   | 9.79                  | 42.43 |
|                   |                        |              |                 |         | Washing Machines    | 0.36 (.60x.60)  | 5    | 1.8       |           |         |                       |       |
|                   |                        |              |                 |         | Dryer               | 0.36 (.60x.60)  | 5    | 1.8       |           |         |                       |       |
|                   |                        |              |                 |         | Front Desk          | 0.75 (1.50x.50) | 1    | 0.75      |           |         |                       |       |
|                   |                        |              |                 |         | Iron Cabinet        | 0.15 (.50x.30)  | 3    | 0.45      |           |         |                       |       |
|                   |                        |              |                 |         | Double Sink         | 0.6 (1x.60)     | 1    | 0.6       |           |         |                       |       |
|                   |                        |              |                 |         |                     |                 |      |           |           |         | 42.43                 |       |



| SPACE PROGRAMMING |                             |              |                 |         |                     |                 |      |           |           |         |                       |       |
|-------------------|-----------------------------|--------------|-----------------|---------|---------------------|-----------------|------|-----------|-----------|---------|-----------------------|-------|
|                   |                             |              |                 |         |                     |                 |      |           |           |         |                       |       |
| Room              | Function                    | No. of Users | Area Per Person | Total A | Furnitures/Fixtures | Area            | Qty. | Total B.1 | Total B.2 | Total C | Circulation Space 30% | Total |
| Balcony           | Outdoor Area for Activities | 15           | 1.5             | 22.5    | Chair               | 0.2 (.45x.45)   | 10   | 2         | 2.81      | 25.31   | 7.59                  | 32.9  |
|                   |                             |              |                 |         | Table               | 0.81 (.90x.90)  | 1    | 0.81      |           |         |                       |       |
|                   |                             |              |                 |         |                     |                 |      |           |           |         |                       | 32.9  |
|                   |                             |              |                 |         |                     |                 |      |           |           |         |                       |       |
| Parking Area      | Area for vehicles           | 20           | 1.5             | 30      | Car                 | 11.25 (2.5x4.5) | 20   | 225       | 225       | 255     | 76.5                  | 331.5 |
|                   |                             |              |                 |         |                     |                 |      |           |           |         |                       | 331.5 |
|                   |                             |              |                 |         |                     |                 |      |           |           |         |                       |       |

| SPACE PROGRAMMING |            |              |                 |         |                    |                |      |           |           |         |                       |       |
|-------------------|------------|--------------|-----------------|---------|--------------------|----------------|------|-----------|-----------|---------|-----------------------|-------|
| Room              | Function   | No. of Users | Area Per Person | Total A | Furniture/Fixtures | Area           | Qty. | Total B.1 | Total B.2 | Total C | Circulation Space 30% | Total |
| Library           | Read books | 15           | 1.5             | 22.5    | Chairs             | 0.2 (.45x.45)  | 15   | 3         |           |         |                       |       |
|                   | Relaxation |              |                 |         | Table              | 0.81 (.90x.90) | 3    | 2.43      | 6.87      | 29.37   | 8.81                  | 38.18 |
|                   |            |              |                 |         | Bookshelves        | 0.72 (1.2x.60) | 2    | 1.44      |           |         |                       |       |
|                   |            |              |                 |         |                    |                |      |           |           |         |                       | 38.18 |

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