# NEIGHBORHOOD PLANNING AND DESIGN MANUAL (FINAL)

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# I. Background

As is the case in many developing countries the housing problems of Ethiopian cities are generally manifested in critical shortage of housing, dilapidation of existing housing stock and lack of basic services and infrastructure for housing development. These problems are exacerbated by large influx of population from rural areas to urban centers. It has now become a burning issue of city administrations, municipalities and residents.

In line with these, cities and municipalities need to be ready for taking proactive measures meant to alleviate the problems and meet the ever-increasing demand. Currently a number of housing development projects are being carried out in Addis Ababa and some other cities in order to reduce the problems and to meet the ever-increasing challenge of urban housing. For the efficient implementation of such interventions a standard neighborhood planning and design manual should have been the major component of housing projects. The absence of standardized manual has thus resulted in inconsistent plan and design principles that obviously emanates from individual (experts) views and preferences. As a consequence there is a possibility of negative outcomes that causes uneconomical space utilization, unfriendly housing developments to residents and lack of integration with different conditions of the project and adjacent areas. This being the prevailing case, however similar housing development programs are planned by the federal government to be carried out in many other urban centers in the years to come.

In this regard it seems high time to have a proper neighborhood planning and design manual that plays significant role in guiding the development of habitable housing that are economical with socially and environmentally friendly neighborhoods and ultimately achieving the goals of the condominium housing development program. Neighborhood planning and design requires various planning and designing stages, levels and procedures to be followed sequentially and coherently, so that neighborhoods could be developed properly to address the problems and needs of urban housing.

It is essential to support the existing efforts through a neighborhood planning and design manual in order to fill the existing gap as well as to support the future efforts of housing development programs of other regions and municipalities. It is against this background that the federal government comes up with this manual as a supportive guideline for regions and municipalities while carrying out housing development program in many other urban centers. The objective of the manual is therefore to facilitate planning and design works by providing a general guideline and tools for technicians with proper neighborhood planning and design principles, process and acceptable standards that are applicable in different situations.

This guidebook is prepared mainly taking the Addis Ababa experience (in condominium housing and design) as a major input and by reviewing the draft federal urban planning and the Addis Ababa local development plan manuals. In addition relevant international neighborhood planning and design manuals (guidelines and standards) have been incorporated in a manner that fits in to the subjective condition of our cities. The next part of the manual explains about the relationship and the level between neighborhood planning and design projects and other urban planning tools structure plan and local development plans. Different concepts and principles of neighborhood planning and design are elaborated in the third part of the manual. The process and procedures to

be followed while launching and conducting a neighborhood planning and design are stated in the forth part. Norms and standards of neighborhood planning and design mainly for guiding spatial elements with considerations figures proportions ranges spacing and the like are also stated to serve as a tool for technicians while conducting the planning and design works. Neighborhood models illustrations are presented in the sixth part to serve as prototype models and to inspire technicians and illustrate the application of some of the principles and concepts into a spatial configuration. Lastly different neighborhood planning and design checklists are listed for technicians.

**Definition of terms**

Family: - is the smallest and yet most significant social unit.

Cluster: - constitute an optimum interfamily social group.

Neighborhood: - is a certain locality of an urban setting developed at a certain period, which is at best a grouping of residential clusters with self-contained services and functions.

Community: - more important communal feature where by two or more neighborhoods separated and as well as interconnected with one another.

City: - a large and densely populated center of economic, social, and political activity, having a relatively fixed geographical position and specific governmental power.

Region: - is a large and generally unified, but loosely defined, geographical area that provides the supporting base for one or more centers of population concentration.

Planning: - is the process of particularizing and, ultimately, of harmonizing the demands of environment, use, and economy. This process has a cultural as well as a utilitarian value, for in creating a plan for any social activity the architect inevitably influences the way in which that activity is performed.

Goal: - is a general statement of the result to be achieved.

Objectives: - is a means of attaining the desired result.

Process: - Step by step activities undertaken by a planning body in the preparation and implementation of urban plans

Principle: - Refer to a set of spatial rules, which should be applied in the settlement making process.

Manual: - Concise reference that shows working procedures and standards for planning and implementation of any development plans.

Norm: - An accepted standard or a way of behaving or doing.

Standard: - The required or agreed level of quality, and quantity for usually when thought of as being correct and written into law.

## II. Scope of neighborhood planning and design

There are different levels of planning that are required for developing neighborhood, which are structure plan, local development plans and neighborhood planning and design projects. Hierarchically a neighborhood planning and design project could be termed as the third level of planning. Accordingly neighborhood planning and design is done at project level, which is the next level of planning to local development plan (LDP) with detail designs and action plans, but in some cases it could also be prepared with the absence of LDP. It contains detail infrastructure layout and designs, house plans and building layouts social and community service plans and preliminary design of buildings. Based on this a neighborhood plan and design is a short-term plan.

Generally according to the current housing development experience if a project is suppose to accommodate more than 1000 housing units it is required to conduct a local development plan before preparing neighborhood plan so that some of the major issues (such as locations and distribution of services at local level, infrastructure layout and integration with city network, basic rules and regulations etc) has to be addressed and planned with the local development plan (having relatively larger scope) which are required to properly guide the neighborhood planning and design. In addition according to the Addis Ababa local development plan preparation manual the minimum LDP action area is set to be 10hectares. Based on this generally the maximum study area for neighborhood planning and design project could be set as 10 hectare and thus if the project area is beyond 10 hectare it requires a local development plan.

Specially if there is no LDP a neighborhood planning and design could be prepared for areas up to 10hectare coverage. But for an action area of above 10 hectares a local development plan should be prepared prior to neighborhood planning and design.

At the neighborhood planning and design project level two types of plans needs to be studied, which are planning area and action area. Planning area of a neighborhood plan and design project is basically the influence area of the neighborhood development. The planning area study helps mainly to ensure integration of a neighborhood planning and design project with the local and city level developments. The action area study contains the detail plans with the actions to be undertaken, infrastructure design and layout and urban design of the neighborhood in company with environmental. Urban design mainly deals with spaces between buildings that consider visual dimensions (scale and proportion of spaces), functional dimensions (functional space for different activities) and social and economic dimensions (suitable spaces for different social groups) to determine the spatial arrangement, space relations, requirements and regulation. Its ultimate goal is to achieve better quality of spaces for living and working etc

Specially if a neighborhood planning and design is to be conducted without local development plan it requires an in depth study at the planning area level, where as if there is an LDP the planning area study mainly contains the framework of the LDP that have influential and governing rules, regulations and guidelines.

The following points illustrate the distinction between LDPs and neighborhood plan:

- Area wise a neighborhood design is small scale where as LDP covers large area
- Neighborhood design focus more on residential housing development where as LDP covers a variety of land uses commercial, industrial, residential …
- LDPs contain short as well as medium and long-term developments where as the neighborhood design focuses on short-term actions, which is to be implemented within 3-5 years.

Neighborhood planning and design could be classified into two types. One is neighborhood planning and design prepared for redevelopment of inner city areas and the other is neighborhood planning and design prepared for new settlement areas such as expansion and infill areas. These classifications are important to know because different approaches and procedures are to be applied depending on the type of neighborhood plan and design.

Basically a neighborhood planning and design could be prepared for redeveloping existing settlement areas with the objective of improving slum and squatter settlement areas and/or increasing density and efficiency of land utilization of inner city areas. In this case the project should focus for accommodating existing residents and might also accommodate additional new setters depending on the condition of the site. It could also accommodate new investment areas for the private sector through lease auction by developing portion of the project area to regenerate the economic potential of the neighborhood.

Accordingly the redevelopment intervention should address problems and needs of existing slum communities and should as well accommodate them in the new development, so that it would be in line with the above stated objective and ultimately with the overall poverty reduction strategy of the government. Based on this the condition, preference and need of existing residents should be carefully assessed and accommodated in the neighborhood plan and design. In other words it should bring a compromise solution between the financial capacity of the residents and the required cost to meet needs and to improve the conditions. In addition the existing infrastructure and services within the site and the planning area should be assessed and considered either to upgrade or replace the available infrastructure and services. Therefore as much as possible it is better to maintain the existing block layout so that the cost of demolishing and new infrastructure provision could be reduced.

In the other case neighborhood planning and design could be prepared for developing new housing settlements in the expansion and infill areas (which are mainly vacant and farming areas) with the objective of increasing the housing stock in order to reduce the housing backlog and to meet the demand.

In this case relatively better freedom is there for planners to create new neighborhood design layouts. But the neighborhood plan and design should generally take into account/consider the target community capacity, need and interest, which could be assessed from newly formed housing cooperatives and individual applicants (i.e. low income, middle and high income groups). Similarly neighborhood planning and design in the expansion and infill areas could also be prepared with the objective of providing resettlement houses for relocated/displaced families. Accordingly the project should carefully address the needs and interest of the relocates.

# III. Neighborhood planning and design principles

Principles are basic frameworks for guiding a neighborhood planning and design. Theses Principles provide framework for wider perspectives by creating integration and link between different dimensions of planning and design (social, economical and physical/ecological aspects) with the objectives and goal of the neighborhood development program. On the other hand principles refer to a set of spatial rules, which should be applied in the settlement making process.

In addition principles and principles are vital tools for guiding experts within a certain context while exercising neighborhood planning and design enables communication and reach to consensus on the neighborhood planning and design with communities, officials and decision makers. Therefore both (concepts and principles) help to build on international and local experiences, practices and knowledge to achieve desirable outcome, which is sustainable neighborhood development.

Sustainable neighborhood development is a development that is ecologically friendly, socially accommodative to enhance positive social interactions and cohesion and economically sound and efficient. In this regard the following neighborhood planning and design concepts and principles are important to be considered while planning and designing. However the transformation and application of these principles and principles into plan and design is a difficult task, which requires expertise debate, discussion and agreement with stakeholders.

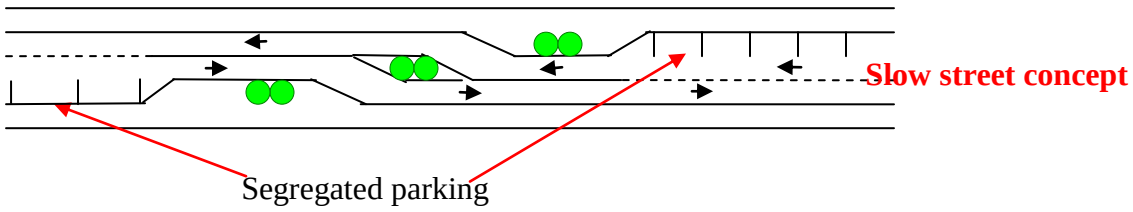
- Create livable and active environment that can integrate with the existing settlement
- Develop and create hierarchy of neighborhood spaces such as public (streets), semi public (courtyards for block clusters for communal activity) and private space (within the housing unit)
- Develop clustered, compact mixed use pedestrian-oriented communities
- Create open society and promote social cohesion, social mix and integration of different communities
- Focus on both ‘inward looking’ neighborhood solutions which means within the selected area and ‘out ward looking’ solutions which means in the offsite areas of the planning area to link the neighborhood economically, socially and physically with the rest part of the city
- Promote mixture of different compatible functions and activities with in the neighborhood (such as designing for residential units on upper levels and shops and other services on the ground to create home /neighborhood based employment opportunities and working spaces and to provide services within walking and biking distances)
- Enhance crime preventive mechanisms through physical planning (to support informal neighborhood social control mechanisms) by designing favorable internal layout of pedestrian routes, roads and buildings to avoid unsafe spaces where rape and other assault are likely to happen (such as entrances to the houses should be open and built in such a way that people living around could observe who are entering into the house and

pedestrian routes to follow roads and facing the front yard of houses than leading through backyard and wooded areas)

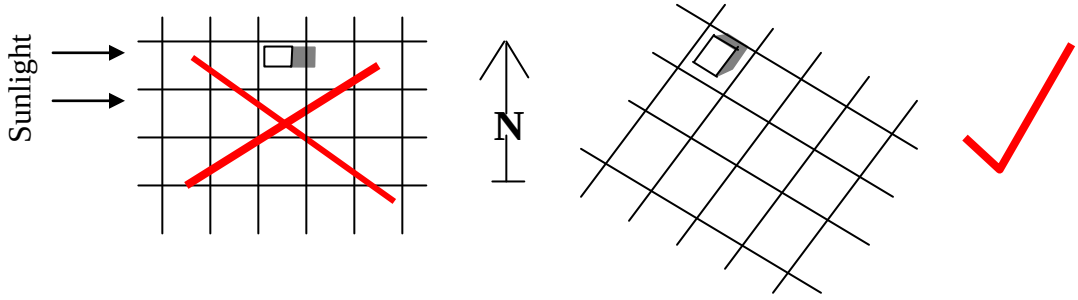
- Integrate specific important site features (natural and man made) while planning and designing e.g. river, landmark and historical buildings, trees etc.

- Create architectural forms and spaces that promote cultural diversity and positive social interactions such as
    - Establishing meeting place within each community, create enclosed spaces between building blocks, design spaces for promoting communal sport activities
    - Providing pedestrian pockets integrated with jobs, services and recreation,
    - Designing terraced housing with medium rise to create a better living environment for children and meeting places for the grownups
    - Providing ramps for disabled persons within buildings and neighborhood

- Focus for encouraging and promoting pedestrian and non-motorized transport specially in the local and access roads like
    - The provision of complete network for pedestrian and cycle routes,
    - Provision of ramps for disabled persons…
    - Discourage fast moving vehicles in local and access roads through winding the streets, constructing bumpers etc




- Design street layout and building orientation in relation to sun orientation that prevents excessive sun light and favors sufficient sun light through avoiding long east-west and north-south road alignments as much as possible




- Develop ecologically friendly and economically sound neighborhoods such as
    - Installing solar panels that produces electricity and hot water,
    - Establish community recycling backyard spaces, community bins and bio gas digesters,

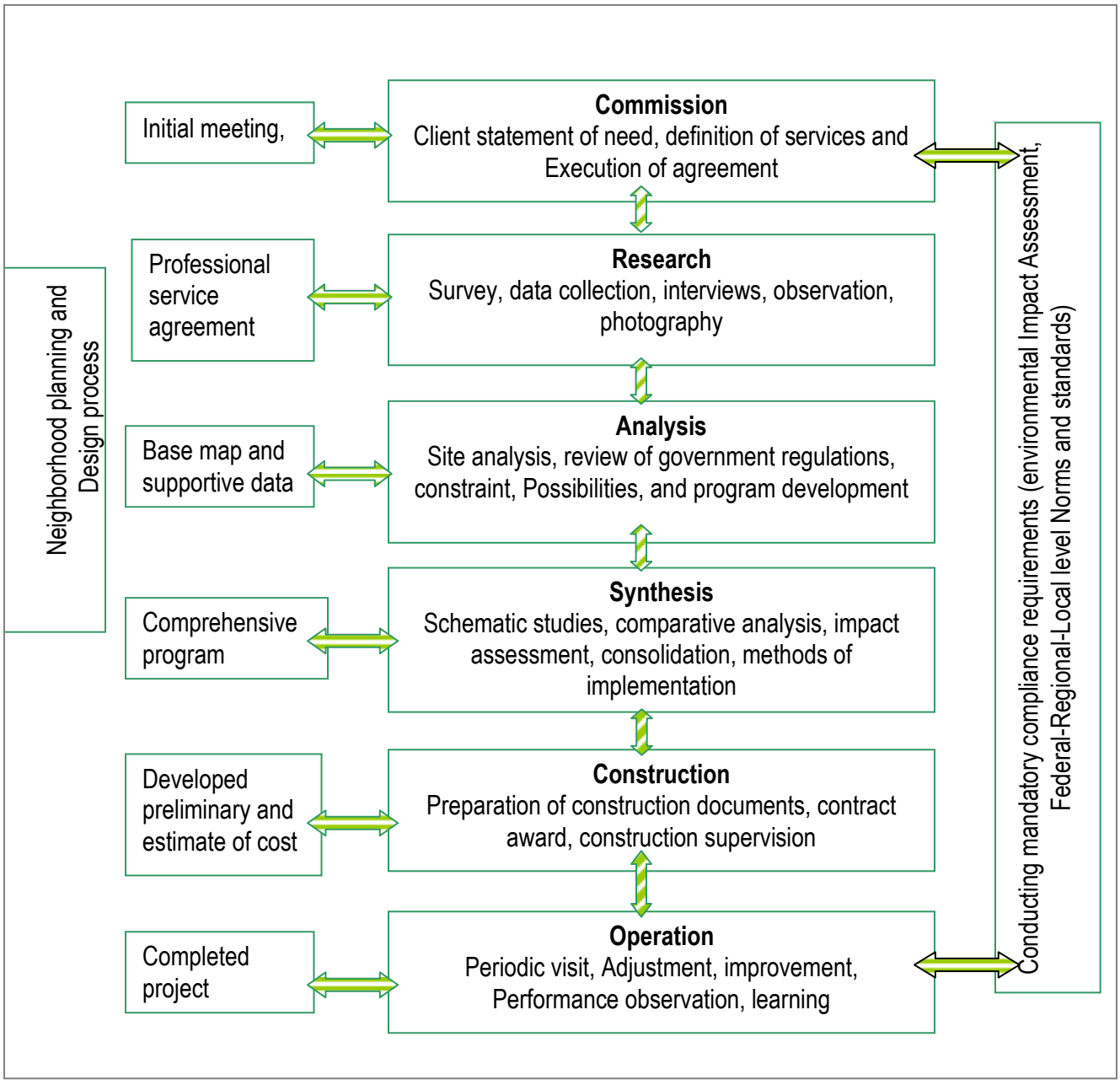
    - Provide space for promoting small organic farming operations through community gardens and roof top gardens for creating favorable climate and enhancing social interactions
    - Provide trees (specially along pedestrian routes) and green areas which are important ingredients of a neighborhood
    - Devise low energy conservation measures like installing low energy consuming bulbs
    - As much as possible reduce hard surfaces (asphalt, concrete pavements…) and maximize green fields for creating favorable micro climate

- Participation; Neighborhood projects need to be planned and designed in consultation with stakeholders, users, cooperatives and targeted communities. Additionally it is required to conduct professionals jury with senior experts from the municipality and other sector offices to ensure technical feasibility of the prepared neighborhood plan and design
- As much as possible avoid negative spaces that are wastage and unusable spaces such as very acute triangle spaces
- Create harmony with land mark and historical buildings while planning and designing roads and buildings in terms of alignment, height, distance and layout that is necessary to harmonize and accentuate the land mark and historical buildings
- Take into consideration of traditional community space organization and utilization of the specific project area whether it is at the front or back yard…
- Take into consideration and integrate available services and infrastructure layout, capacity, hierarchy etc
- Specify the recommendable materials for construction (such as pedestrian and vehicular pavements, building materials…) and type of vegetation

# IV. Neighborhood Planning and Design Process

Neighborhood planning and design process is a holistic planning approach that integrates all the necessary facts and aspects regarding a selected project site selection, analysis; and development impact assessments on the surrounding environment.

**Neighbourhood development Process diagrammatic illustration**



The main concern of this manual as indicated in the above illustration, the professionals or technicians service that begins from research level onwards to the operation of such projects. In detail the professional service is presented below. The major areas are three.

1. Site selection: - The primary work of any planners to help fit human activities to the" want to be" of the land. Given the fact and full understanding of the alternative sites, reason tends to prevail of the best possible place for a project.

2. Site analysis: - The formulation of a detailed program (requirements) and an analysis of the selected site (site and topographic survey).

3. Environmental Impact assessment: - earth, water, atmosphere, vegetation, built environment, Social factors, visual and human interest.

## 1. Site Selection

A comparative analysis of alternative neighborhood planning sites goes after the following suggested procedures. A visit to each site and surroundings is essential. Photographs help – as do notes describing in more detail the key features rated by values both negative and positive where by the arithmetic sun of each column would give a general indication of its relative overall rating.

There are four variables to be considered during this analysis and be rated by values. These are Sever limitation, moderate constraint, condition good and condition excellent. The table below shows a typical format to be used in comparative analysis of alternative sites.

| Site Selection Criteria | Alternative sites (Arithmetic Values) | | | |
|---|---|---|---|---|
| | Site 1 | Site 2 | Site 3 | Site 4 |
| A. REGIONAL LEVEL | | | | |
| B. CITY (COMMINITY) LEVEL | | | | |
| C. NEIGHBORHOOD LEVEL | | | | |
| D. STUDY AREA (PROPERTY) | | | | |
| E. BUILDING SITE (EXACT LOCATION) | | | | |
| Total Sum | | | | |
| Rank | | | | |

Given the fact and full understanding of the alternative sites, reason tends to prevail of the best possible place for a project.

## SITE SELECTION CRITERIA FROM ALTERNATIVE SITES

### A. REGIONAL LEVEL

Climate (Temperature, rainfall, storms, etc)
Soils (Stability, fertility, depths)
Water supply and quality
Economy (Rising, Stable, Declining)
Transportation (Highways and transit)
Energy (Avai1ability and relative cost)
Landscape character
Cultural opportunities
Recreational opportunities.
Emp1oyment opportunities
Health care facilities

### B. CITY (COMMINITY) LEVEL

Travel (Time -distance to work shopping etc.)
Travel experience (pleasant or unpleasant)
Community environment
Schools
Shopping
Faith centers
Cultural opportunities (Library and auditorium)
Pubic services (Fire, police. etc.)
Safety and security
Medical facilities
Governance Taxes

### C. NEIGHBORHOOD LEVEL

Landscape character
Life style
Compatibility of proposed uses
Traffic ways (Access, hazard, attractiveness)
Schools
Conveniences (school, service etc.)
Parks, recreation and open space
Exposure (sun wind storms flooding)
Freeborn from noise fumes, etc
Utilities (Availability and cost)

### D. STUDY AREA (PROPERTY)

Size and shape (suitability)
Aspect from approaches
Safe entrance and outlet
On - site "feel'
Permanence trees and cover
Need for clearing, weed eradication
Ground forms and gradients
Soils (quality and depth)
Relative cost of earthwork and foundation
Site drainage
Adjacent structures (or lack of)
Neighbors
Relationship to circulation patterns
Relative cost of land and development

### E. BUILDING SITE (EXACT LOCATION)

Topographic "fit" of programmed uses
Gradient of approaches
Sight distance at entrance drive
Orientation to sun, wind and breeze
Views
Privacy
Freedom from noise and glare
Visual impact of neighboring uses
Visual impact upon neighboring uses
Proximity to utility lead

## 2. Site Assessment and Analysis

The process of site analysis is usually intended with the investigation of the planning area (region) embracing the project site (action Area).

The following procedure is suggested as a guide to systematic site analysis.

1. **Influence (Planning) area study: -** the site analysis process most often begins with the location of the project site on a city map and a cursory investigation of vicinity, influence and action area planning factors.

   From such documents such as Geological survey maps, land use plan , road maps, and various planning reports much useful insight can be gained as to the surrounding topographic features, land uses, roadway and transportation network, recreation opportunities, and employment, commercial, and cultural center.

2. **The Project Site: -** The planner must have a full understanding of the specific site nature, constraints and possibilities. This is obtained from survey information, aerial photography, site visitation, and the detail analysis of existing and proposed conditions as outlined in a variety of available publications and maps (The respective city's Strategic development frame work plan /SDFP).

3. **Topographic Survey: -** This base map is customarily prepared by a registered surveyor at an engineering scale predetermined as that being set for the base mapping and planning studies. The planner prepares a survey specification describing the information to be provided and the form of presentation.

4. **Base Map: -** this plan, usually prepared at the same scale as the topographic survey, is used as a background or base of many overlays to follow. It contains only information to be examined for successive studies.

5. **Overlays: -** A reproductive print of the base map is used for each over lay. Each overlay will contain all information relating to one type of background information pertinent to the planning study. While the number and nature of the overlay plans will depend upon the complexity of the planning project, the following are usually included or be prepared in layers (In AutoCAD):

   - *Slopes and drainage:* contour map
   - *Soil:* soil types, classification, with location of test pit
   - *Water resource:* location of water bodies and waterways, on-site and off-site well fields, near water sources.
   - *Vegetation:* Plant Community

- *Structure:* Buildings, bridges culverts, walls, dams
- *Circulation:* existing vehicular and pedestrian movement, access to the site from the surrounding.
- *Utilities:* existing electricity, telephone and water and sewer lines
- *Visual Analysis:* Scenic features and views
- *Impact assessment:* Constraints
- *Preservation and Conservation:* Notation as areas and features to be preserved with limited and compatible uses.

6. **Site analysis map: -** is one of the most effective means of developing a keen perception of the study area (property) and its nature. A print of the topographic survey map by the surveyor is taken into the field, and from actual site observation additional notes are jotted down upon it in the planner's own annotation or symbols.

   Such Supplementary information might describe or note:
   - Land owner ship
   - Potential building locations, use areas
   - Roads right of way
   - Other factors of special significance in the project planning
   - Direction and relative volume of Vehicular traffic flow on approach roads, pedestrian routs.
   - Prevailing wind direction
   - Springs, ponds, flooding, specimen trees
   - Best views to be featured

7. **Reference Plans and reports: -** as the surveys, base map, overlays, and site analysis map are developed, they are assembled as a bound and coordinated set of information, together with a supporting file of referenced plans, reports, and correspondence. All are kept and updated throughout the planning process.

   The materials in the reference plans and reports will vary with each project but will often include information on:
   - Regional or City level master plans
   - Zoning and subdivision regulation
   - Local development Plans (LDP)
   - Norms and standards
   - Cultural amenities
   - Aviation regulation (flight zone)
   - Flood and storm
   - SWOT analysis: - considering the specific site condition as internal factors (strength and weakness) and off site conditions as external factors (opportunity and threat) to be conducted specially with local officials and experts and identify critical issues.

## 3. Environmental Impact Assessment

On projects of larger scope or greater complexity or those requiring lengthy planning process and are in particular aided by the federal government, environmental impact assessment are very much compulsory for its feasible implementation. These sets may be considered as a graphic checklist of environmental concern.

Environmental impact considerations are defined and explored earlier during site survey and analysis periods so that they become not only a test but also a sound basis for the evolving planning solution. The negative impacts of the project can be reduced and the attributes significantly increased during the planning process. The many benefits of such a systematic approach cannot be overemphasized.

> "Therefore let us build houses to man the life giving, life enhancing elements of nature. This means an architecture that begins with the nature of the site. Which means taking the first great step toward assuring a worthy architecture, for in the rightness of a house on the land we sense a fitness we call beauty."
>
> Frank Lloyd Wright

The impact assessment of the proposed project covers its contact with the surrounding eco-environs and vice versus on: -

- Destruction and or modification of habitat
- Alteration of surface drainage
- Change in stream or river flow
- Effect on fresh water reserve
- Excavation, filling or grading
- Mining or extraction
- Forestry
- Blasting, drilling and explosions
- Cart away disposal
- Both solid and liquid waste disposal and treatment
- And other relevant aspects

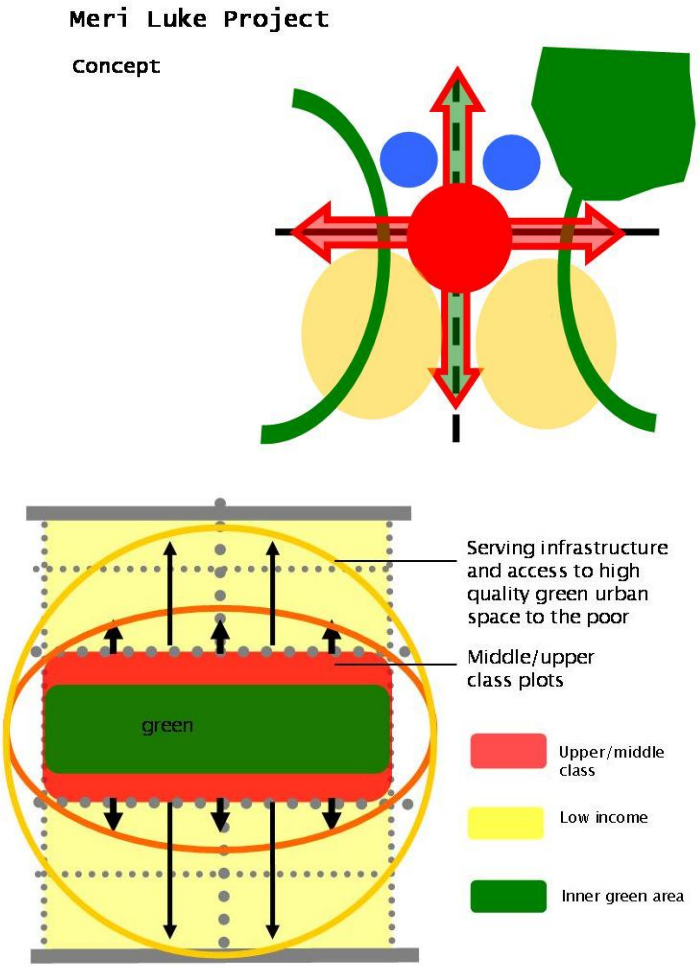
Generally speaking environmental impact assessment principle helps to realize a project on a site effectively by fully understanding the program, and fully aware of the physical properties of the site and of the total environs which leads to action to be under taken and mitigate environmental hazards and to enhance positive inputs.

We have by now developed a comprehensive program defining the proposed nature of our project. We have become fully aware of all features of the total neighborhood. Up to this point, the planning effort has been one of research and analysis**.** Then follows formulation of basic ***concept*** and interpretation of this particular concept on the basic ***project site types to neighborhood plan*** integration.

## A. Conceptual Plan

Conceptual plan preparation process is an area of the conceptual and forming process that is common to the major physical planning disciplines. This is the formulation of the basic plan concept by which in sketch and diagram the use areas and plan forms are conceived in harmony with the natural and constructed forms, forces, and features of the total project site. Usually the plan concept is best arrived at through a collaborative effort in which all participants contribute freely of their experience and ideas.

This phase is of vital importance because it is the only means by which we can achieve full command of the data on which our design will be based. From this point on, the planning process becomes one of integration of proposed uses, structures, and site.




*Sample conceptual plan (Meri Luke)*

If structure and site development are contemplated, it is impossible to conceive one with out the other, for it is the relationship of structure to site and site to structure that gives meaning to each other and to both.

An effective collaboration brings together experts in various fields of knowledge who are on the planning team (architect, planners, engineer and others), in a free interchange of ideas; develop an atmosphere of perspective understanding and know-how.

## B. Project site and neighborhood plan expression

At this stage the harmony between the different Neighborhoods design characteristics and their respective project site nature or types should be given at most emphasis. Below we have listed four different categories of neighborhood expressions a planner has to refer while working on the major four-project sites.

The Different Project site types: -

i. **Inner city site**
ii. **Expansion site**
iii. **Sloppy site**
iv. **Level (flat) site**

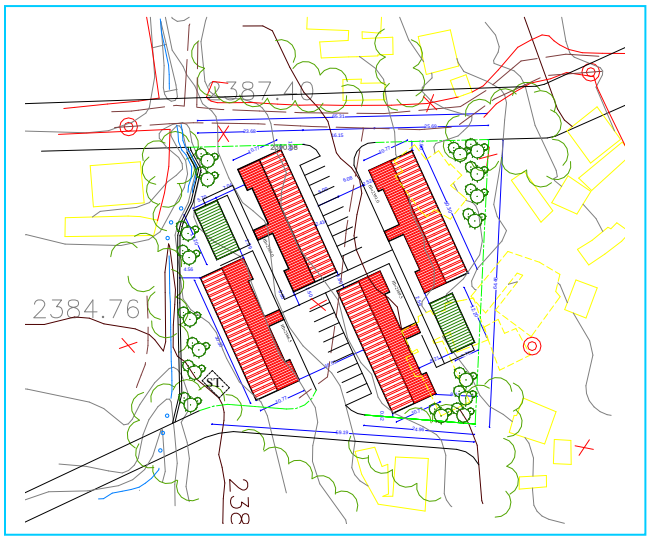
Users of this manual are advised to apply two of the pertinent expressions at a time when dealing with mixed project types. These special cases are sloppy inner city, flat inner city, sloppy expansion and flat expansion areas. The neighborhood plan expression we have to apply regarding the different project site types is expressed below in detail.

### i. Inner city site

This urban development scheme can also be called urban infill scheme. The plan will be compact, of necessary to utilize the scares urban area fully; a maximum of the property of the study area may be included.

The multiple or mixed use and the interplay of horizontal and vertical volume (Variety of buildings in height) in the design process will probably be used to expand the apparent limited space. Any reference materials regarding built up density according to the structure plan of the particular city has to be passed on the new development design work.

*Aware Den Limat (sample 1)*




The city environs impose a sense of confinement and oppression on the new housing development. Rigid property lines for the new developments may be softened to relief the sense of tight enclosure.

City streets and pedestrian walks are major lines of approach, observation, and access to the site. They are elements most strongly relating the new dwelling to the existing community. Therefore, bringing existing roads and walkways to the site could help also the site's integration with an existing neighbors and settlements.

The design of these new structures should also take in to consideration the new cityscape these buildings could create.

Inner city, with their concentration of built environ, are hotter in the summer and colder in winter than the suburbs and countryside. The climate can be amended by the provision of open spaces preserves, parks, street planting and gardens in the new settlement design and construction works.

Since natural features are very scares in the inner cities; trees, intersecting ground forms, rocks, and water bodies should be preserved and incorporated with the new settlement design to increase value and meaning.

An inner city site has a fishbowl quality resulting from the proximity of neighbors. Privacy is the basic design requirement in a new inner city dwelling designs. A logical orientation of such structures is inward, to communal uses, gardens and courts.

### ii. Expansion site development

This area has plenty of land for a relaxed neighborhood design practices. The plan is more open, free. The visual limits may include extensive sweeps of the landscape. The scope of the planning and design considerations is increased; even a mountaintop far away from the site may become

design factors and elements. Since all features of the landscape that can be seen or sensed are part of the extensional site.

Ample area permits an exploded plan, each element being related to the most compatible topographic features. We may logically orient our plan outward to embrace the total site's best features and to command the best views.

The choice of an expansion site would indicate a desire to be at one with nature. Therefore, make nature appreciation a design aim and theme.

A structure conceived in studied relation to ground forms gains in architectural strength and in harmony with the site.

During this kind of development structure become elements imposed on the landscape. Either the site is considered basically a setting for a dominant structure, or the structure is conceived as subordinate to the landscape and designed to complement the natural contours and forms. The site-structure diagram and structural forms should reflect thorough understanding of and adaptation to the climate.

Both the vehicular and pedestrian approaches, important element in our design, may often be aligned within the project site boundaries to reveal the best site and architectural features.

The use of indigenous building materials in buildings (like communal use), fences, culverts and walls helps to relate structures to their surroundings.

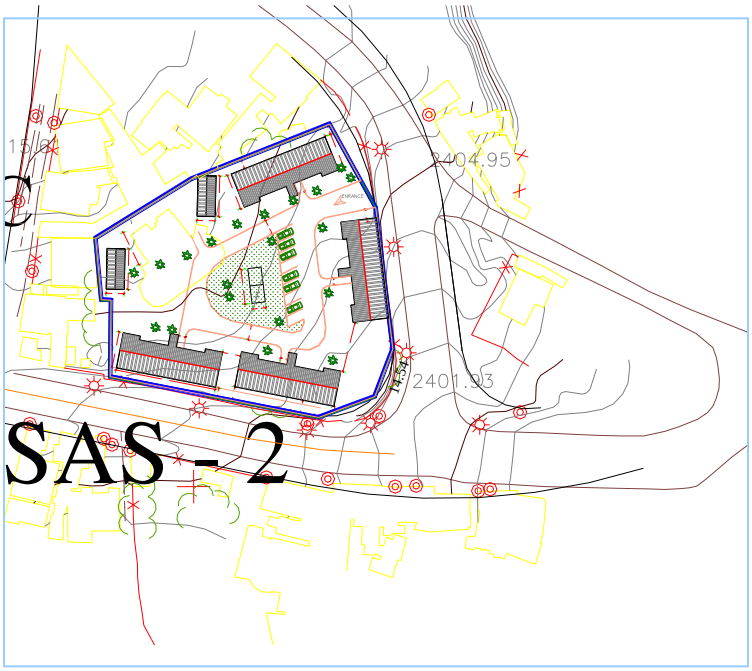
### iii. Steeply Sloping Site development

Neighborhood planning and design in the steeply sloping areas contours are major plan factors. Contour planning (alignment of plan elements parallel to with the contour) is generally indicated.

The essence of slope is rise and fall. A terraced scheme is suggested. Levels may separate functions, as in split level or multi-deck structures. The slope is a ramp. Ramps and steps are logical plan elements.

On a sloping site terracing, retaining walls, the supported plat form, or the cantilever achieves the level plane.

The slope grade is perhaps too steep for vehicular traffic. Therefore, access is easiest along the contours.




*Key Bahir Site*

The sloping site has a dynamic landscape quality so that the site lends itself to lively plan forms. This natural grade changes may be accentuated and dramatized through the use of terraces, overlook decks, and flying balconies.

A sloping site affords interest in views. Site development to create richness of landscape detail may be minimized, for when a sloping site commands a fine view, little else is required.

Plan orientation in sloping site is normally outward and down due to its nature that the slope is oriented outward. Since the view side is exposed, the plan relation to sun, wind, and storm is of increased concern.

A sloping site has drainage problems. Groundwater and surface runoff from above must be intercepted and diverted or allowed to pass freely under the structure. And a slope brings out many of the most desirable qualities of water. Therefore the play of water in falls, spill out, gushes is an obvious plan opportunity.

### iv. Flat (Level) site development

Neighborhood planning on level site offers a minimum of plan restrictions. Of all site types, the flat site best adapts itself to the cell-bud, crystalline, or geometric plan pattern. The planning interest depends upon the relationship of space to space, object to space, and object to object. And this site has a relatively minor landscape interest.

A flat site is essentially a broad-based plane. All structures set upon this plane are of strong visual importance, as is their relation one to the other. And a flat site has no focal point also that the most visually strong or insistent element placed on this site will dominant the scene.

The sun is a powerful design factor on this kind of site so that we should incorporate it in terms of its light and shadow effects. We need to explore the numerous qualities of light and utilize the most effective relation to our form, color, texture, and materials. We may also dramatize cast shadow-solid as from a wall, sculptural as from objects, or as dark background and foil for luminous objects displayed against it.

Flat site neighborhood development offers little privacy. The creation of privacy is a function of the plan orientation. Privacy may be attained by the focus of spaces towards screening walls or other elements, inward to enclosed courts, or outward to infinity from viewing points on the periphery of the project area.

A flat (level) site has a neutral landscape quality. Site character is created by the elements introduced. The dome of the sky is a dominant landscape element of infinite change and beauty. We may all feature the sky through the use of patios, courts, and recessed openings.

Since flat site tends toward monotony, maximize every topographical opportunity in order to enhance and dramatized buildings in all ways possible.

# V. Neighborhood design guidelines, norm & standards

This neighborhood planning & design norm & standard is prepared based on the norms and standards of the Addis Ababa structure plan, building permit guideline of Addis Ababa, which is being used by the A.A. Infrastructure development and construction authority; also the National building code of Ethiopia, and international standards.

It addresses the physical, social and environmental components of the neighborhood design as the scope of a neighborhood design ranges from the housing unit level to the microclimate. The neighborhood guideline preparation has also try to seen the different physical, social, cultural & environmental variations within the country.

## 1. Built up Density

Worldwide the concept of creating a sustainable and compact city is being promoted as it has social, economic and environmental advantages i.e. encouraging positive interaction and diversity; improving viability of and access to community services; enhancing the economic viability of development & infrastructure; supporting public transport; increasing efficiency of energy and resource utilization.

In a neighborhood housing development program, the density range for a certain area can be given in the terms of reference based on the particular city norm and standard. Density of an area may vary not only from region to region; but also within the city based on employment opportunity, resident's interest, development trend, land value etc. In the case of Addis Ababa, density proposal is set for the different zones on the structure plan. In core areas where the land value is high, with better service and infrastructure provision, job opportunity and transportation, dense development is foreseen relatively to maximize efficient utilization of resources.

| *Density Zone* | Proposed Gross density Household / Hec | Population Gross density Inhabitants / hec |
|---|---|---|
| Core area | 190-380 | 950-2000 |
| *Intermediate* | 120-190 | 600-950 |
| Periphery | 54-120 | 270-600 |

Source: Norms & standards of the A.A. city structure plan and its components

For a neighborhood development area whose total area exceeds 1ha assuming in intermediate area, the gross density range is used as a guideline due to the need to accommodate necessary social service to the residents. But for small area, in assumption the new housing development get its needs from adjacent existing services within the planning area, net residential density is calculated.

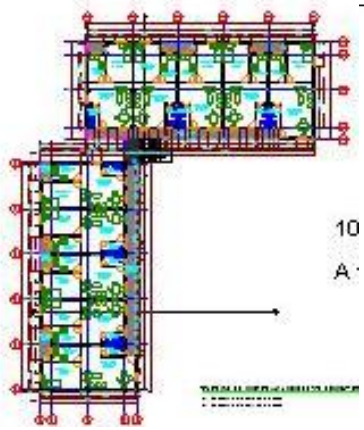
Therefore a neighborhood density should base on the particular city density proposal indicated in the respective norm and standard. Then in the neighborhood design stage, it is recommendable to exercise and develop different alternative neighborhood sample designs within the given density range and apply it in the study area. For cities without norm and standard of their own, the following guideline helps technicians in the neighborhood plan preparation

- Conduct a random survey of the existing built up density in the different zones of the city by the neighborhood planning team,
- Then based on the survey, evaluate the existing efficient use of land and the future growth trend
- Determine the density range for the particular area in respect with the city's zones
- Exercise sample neighborhood designs within the range, refer the sample model neighborhood designs attached in the index.

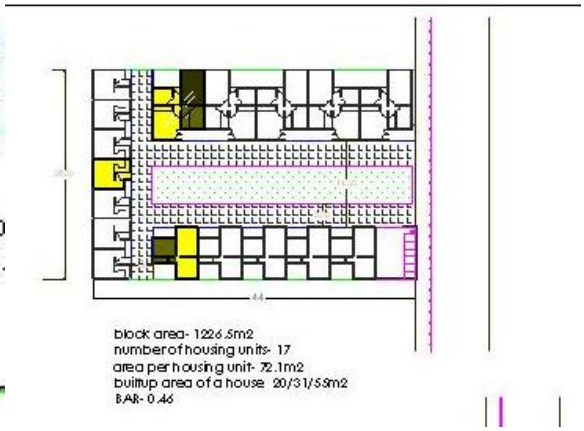
## 2. Building typology

### Main House

A variety of condominium building typologies are being used by the A.A. housing development project office that are economical and suitable to the different income groups. Most of the condominium building typologies are of G+ 4 storey respecting the city's building height regulation i.e. G + 0 – G +4. For a neighborhood plan of a wider area cover, variation of building height and density in accordance to the land value of the area is important to maximize the use of existing infrastructure and avoid monotonous urban character.



10 household ( One bedroom type) in each floor
In G+4 storey , the main house accommodates
50 households




Low cost condominium row house of G+ 0 – G +1 that can allow incremental construction is advisable for low-income groups in the regions

Sample condominium housing typology

**Communal Houses**

There are also communal houses of G+0 that accommodate common laundry, slaughterhouse and stores. Specific location for these communal buildings should lie in between intersection areas of semi public and private uses at equidistance or radius from every beneficiary house. These houses might be considered flexible in use and needs sufficient light and air-conditioned location.

- Ratio of communal house to household

Analyzing the existing practice in the project office, provision of a communal house of G+1 or (two G + 0 communal houses) for an average of 90 households, it is recommended to improve the ratio to
One G+ 0 Communal house per an average of 30 household (one building) or
One G + 1 Communal house per an average of 60 household

N.B. To maximize efficient space use of the existing communal house, design modification is recommended; such as externalizing circulation at ground floor and minimizing partitions. It is also necessary to revise the typologies according to the different contexts; the city's building height regulation, capacity of the inhabitant and climate. For example in hot climate areas, the room height and the building layout should favor ventilation.
In the neighborhood design of wide area cover, It is necessary to mix different building height typologies to avoid monotonous character.

**Social mixity standard**

According to the A.A. building permit regulation, Social mixity standard in housing development is set in a proportion of 75- 95% for the low income and middle income group and 3- 5% for high-income group.

Though the target of the housing development program is to address housing for the low income group, in addition to the neighborhood design principle to bring social mix ; the land value and investment demand in the action area need a consideration ;thus the proportion of mixity should be regulated as

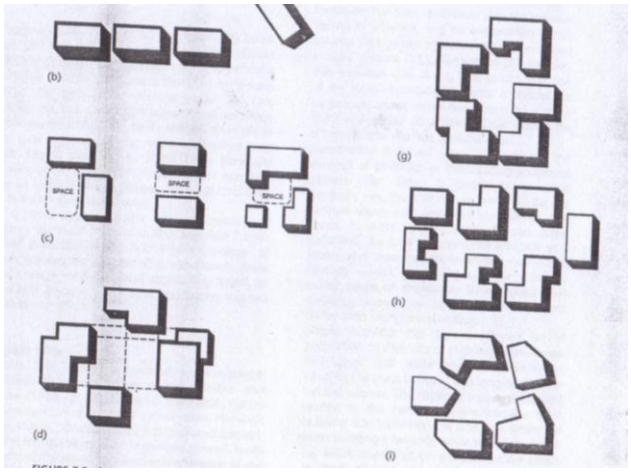
- Low-income group --------- 50 - 75%
- Middle income --------- 25 - 45%
- High income --------- 5 - 10%, which can be leased out to developers

## 3. Open space

The idea of condominium housing though under familiarized, the neighborhood design has to encourage the previous living qualities at a certain level i.e. common green spaces for children playing area and other activities like meeting, edir, holiday celebration to address all age group. Thus in the neighborhood design, it is necessary to regulate the quality & quantity of space.

## Open space enclosure

Out door space can be considered in terms of positive and negative spaces based on the degree of enclosure. Positive, relatively enclosed space has a definite and distinctive shape whereas the latter is shapeless and inconceivable. The amount of enclosure and the resulting degree of containment partially depends on the ratio of the width of space to the height of enclosing wall. The weakest definition of space typically occurs when buildings are organized in row .In this situation the buildings are individual, unrelated elements in without containment .One of the means of achieving compositional order is the sitting of buildings at right angles to one another where the corners of the space are open, forming street intersection or a gap between buildings space leaks out through the corner openings.

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Linear arrangement of building verses building at right angle
( Photos of sample neighborhoods in Addis Ababa)

## Built up area to open space ratio (BAR)

In the case of A.A. building permit regulation BAR for condominium houses is 75 - 85% including parking space. This standard is applicable in core areas of Addis where the density is very high. A neighborhood of a wide area usually develops in the intermediate area. In this case the built up area depends on the available area for development and the minimum area requirement for open space provision at neighborhood level. .

**Neighborhood open spaces standard**

Community spaces are used for recreational and sport activities.

| Level of open space | Space requirement | Catchments area | Served population | Location |
|---|---|---|---|---|
| Play lot (at residential cluster) | 0.1-0.2 ha | 120 m radius | 1,250- 1,750 inh. (250-350 Household) | -Center of catchments area,<br>-Not adjacent to collector street |
| Play lot (at residential cluster ) | 0.3 - 0.4 ha | 400 m radius | 5,000 – 10,000inh. (1,000 – 2,000 Household) | - Within the catchments area |

Source: Urban planning and implementation manual (Draft version)

## 4. Building layout and orientation

In allocating the buildings within a certain selected action area in the neighborhood design, one has to consider:

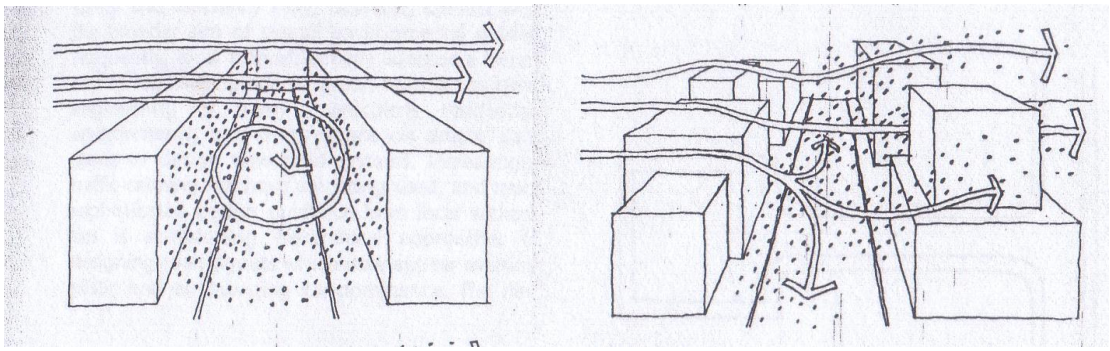
- **Sunlight**

Sunlight penetration varies over the season and location. Ethiopia located near the equator gets overhead sun adequately. But the layout of building facing the east - west direction is not preferable as it has high sunlight penetration and create uncomfortable living environment. Therefore avoid / minimize orientation of the longer side of the building in the east – west direction.

- **Wind**

During analysis, identifying the predominate wind direction in the action area is necessary. In order to reduce wind pressure, the orientation of the longer building side should be perpendicular to the wind.

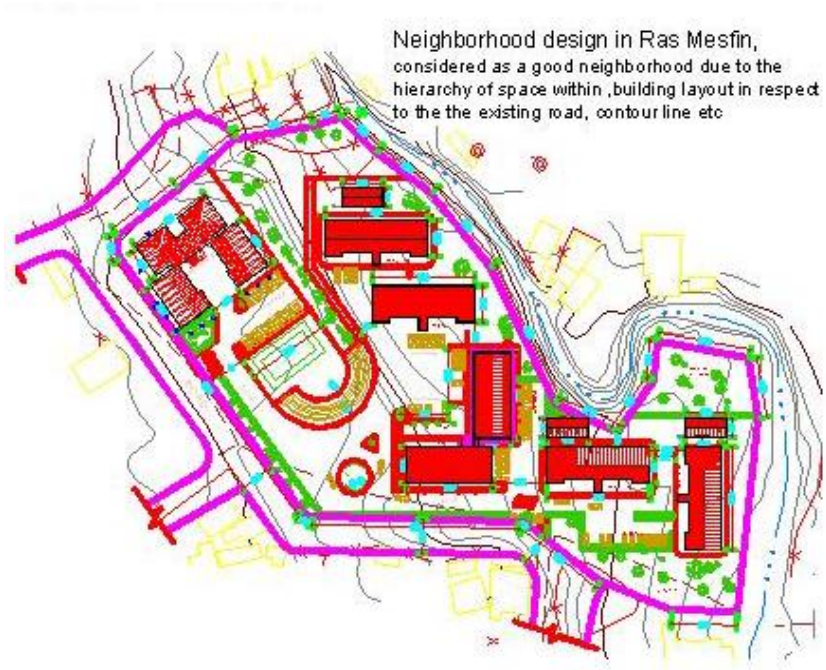
Creating open space perforation through building arrangement and building height variation is also necessary to avoid wind tunnel effects and improve the air quality at street level.



Open space perforation through building arrangement and building height variation HELPS TO avoid wind tunnel effects.

- **Topography**

In areas where the topography is sloppy, building layout should be parallel to the contour line in order to minimize cost of construction.
However, in the neighborhood design the planner has to respect the existing urban structure mainly the main access road; the orientation of the main buildings along the main road should be either in parallel or perpendicular to the main road. This enhances not only the urban quality of the neighborhood but also helps to bring a harmonious development at city level.




Neighborhood design in Ras Mesfin, considered as a good neighborhood design due to the hierarchy of space within, building layout in respect to the existing road, contour line etc

## 5. Set back regulation

Maintaining a desirable height of buildings in respect with the adjacent street / setback from the point of view of the general public, has three underlying importance:

1. Congestion; Congestion in the streets will result if too great a number of people are employed in or served by it; that is, in general, from too great a total ***volume or cubage*** of the building.
2. Light and air; Insufficient light and air in the street and in the building will result due to the shadow of the front elevation building
3. Architectural effect, Loss of architectural effect will result when the building has such a great height that it cannot be viewed at a proper angle.

The above factors worldwide are nearly a direct ratio as the width of the street upon which the building faces. In this neighborhood manual, congestion in terms of through traffic in the sidewalks has been covered in the road section. As the housing program to be carried out by the government is focused on low cost walk up apartment houses, with a maximum height of G+ 4, the impact of shadow of a building on its neighborhood building is neglected . This is as stated Ethiopia located in the equator; get an overhead sun during a day with this assumption the building permit of Addis also is concerned on the privacy, light adequacy and fire hazard of a building.

**Existing practices and working building permit regulation**

1. Setback of a building from the property line
   - Main buildings shall be erected on public property line with the consent of the building official.
   - A building without an opening in its side can be constructed on the property line.
   - Main buildings, which are purely residence, are not permitted to encroach on the right of way of public roads.
   - A building purely residential should have a minimum of 2m setbacks from main road. If it accommodates commercial use at the ground level, it can be built on the property line.
   - A building with top widow opening, the minimum setback should be 1.0m from the property line.
   - For a standard window, the minimum setback should be 2.0m from the property line.

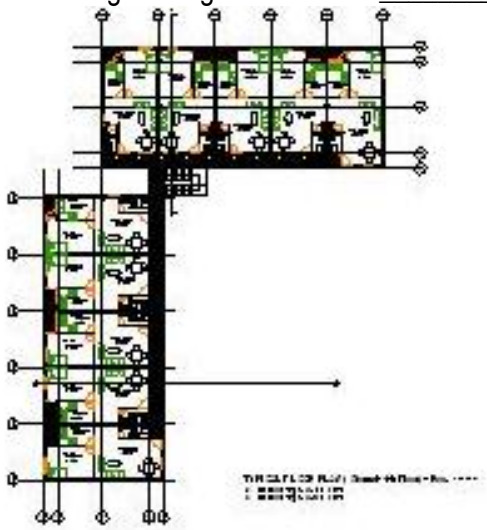
2. For buildings within same compound facing each other should have a minimum setback of 6m from each other.

Taking the existing practice for any piece meal development, in adaptation with the housing neighborhood development, the need for modification has raised necessary in the neighborhood planning and design. Factors considered in setting the regulation

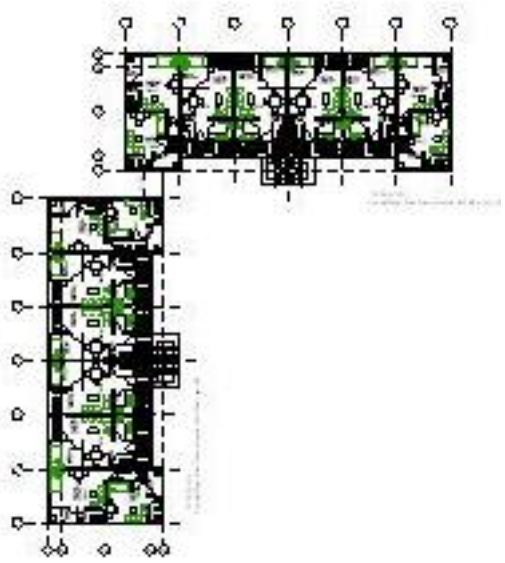
- Existing building typologies used
- The necessity to provide adequate sunlight and ventilation in each flat
- The necessity to maintain a buffer for minimizing the risk of fire dissemination
- The necessity of open space provision for the community
- Efficient use of land
- Minimum pedestrian access through buildings

## Set Back Regulation for a neighborhood design

1.Main building sharing common stair_____minimum 2.50 m as per the standard design

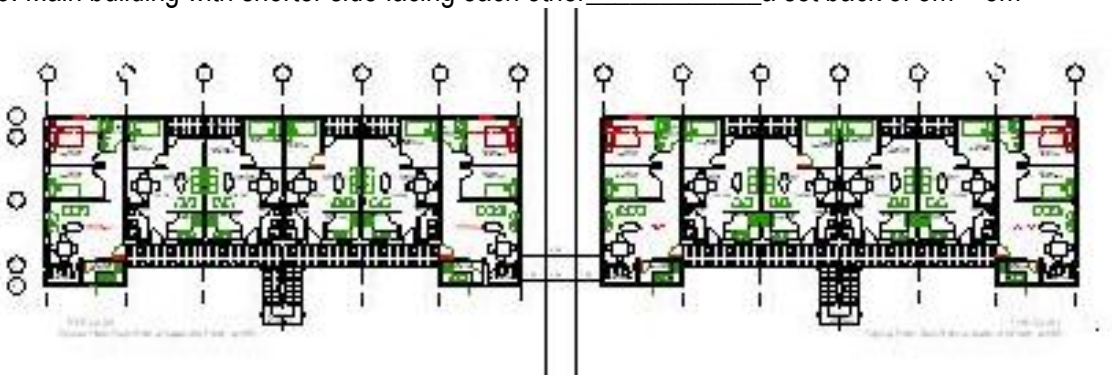


2.Main building placed at right angle without sharing a common stair_____ minimum 2.50 m



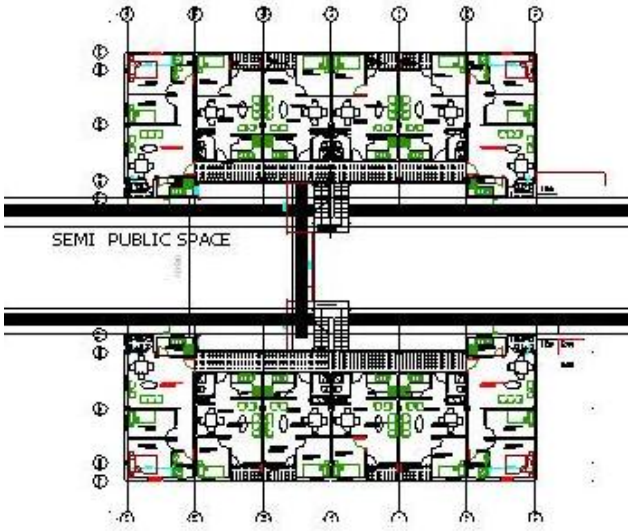
N.B Arrangement of main buildings at right angle shouldn't exceed more than once, as it is necessary for flow of space and visual interaction with its adjacent neighborhood.

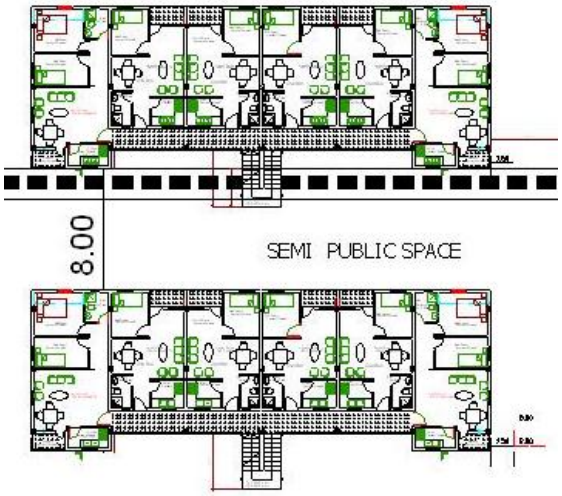
3. Main building with shorter side facing each other_____a set back of 5m – 8m



A minimum of 5m – 8m setback for protection from fire hazard and 2.0 m pedestrian access

4. Main building with longer side facing the semi public space

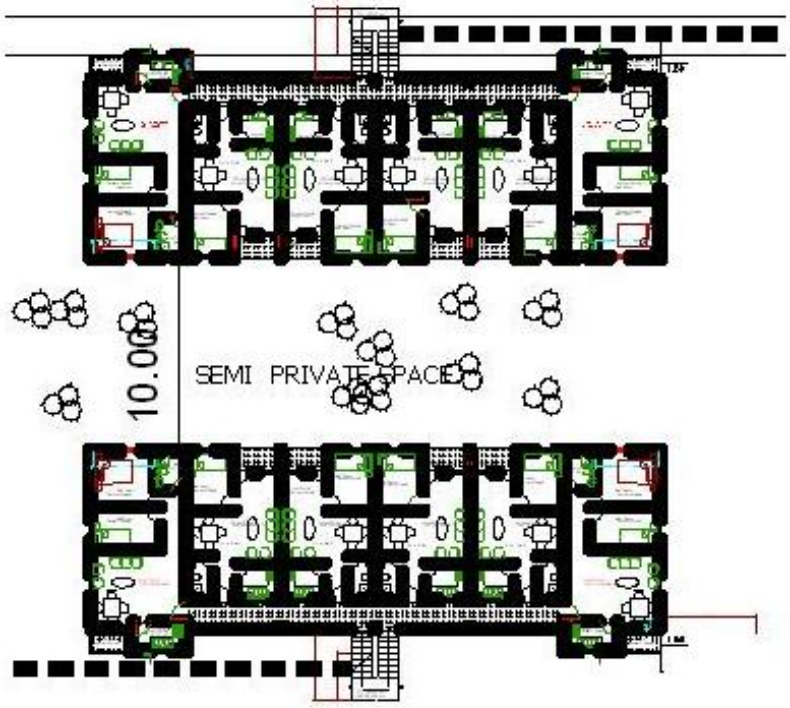



Minimum setback 10.0 m

_____minimum setback 8.0 m

5. Main building with longer side facing the semi private space _____minimum setback 10m
Particularly for privacy but for effective space utilization, the backyard can be used for purposes like clothe drying etc.




## 6. Road

Depending on the size of the neighborhood, the road network design focuses on the integration of the action area with the planning area. Its focus is limited to Collector Street & local streets.

**Road layout and hierarchy**

- Collector streets provide traffic movement between arterial and Local Street and direct access to the abutting property whereas local access roads provide access.

| Street type | Standard Spacing |
|---|---|
| Collector street (CS) | 300-800m |
| Local street (LS) | 150-300m |
| Access roads | Depending on the size of block |

Source: Norms & standards of the A.A. city structure plan and its components

- Design of local streets should discourage through traffic in order to bring safe residential area. Some of the mechanisms are winding a street or breaking the continuity of access road.
- Driveways shall enter public streets at safe location; away from junctions.

- Design access road & parking location in relation to the entrance of the housing building. It should be economical, convenient to the inhabitants, minimize traffic conflict & noise disturbance.
- Pedestrian walkways should be designed to connect the different semi public spaces. Their layout should also provide alternative pathway & short cuts to fulfill the preference of the inhabitants.
- The minimum pedestrian walkway width should be 1.5m and need to be paved.
- Handicapped people can be integrated only at ground floor as the low cost condominium houses are of a medium height of G+ 4 without a lift. Therefore pedestrian walkways for handicapped people need to be designed with a ramp, a slope less than 4.5%.
- Segregate parking for shops at the ground level to the resident's parking lot i.e by providing parking along main roads

**Road right of way width**

| Street type | Right of way | | | Remark |
|---|---|---|---|---|
| | Core area | Intermediate | Expansion | |
| Collector streets-cs | 11 -20 | 11 -20 | 11 -20 | |
| Access road | 4 -10 | 8-10 | 10 -12 | |

Source: Norms & standards of the A.A. city structure plan and its components

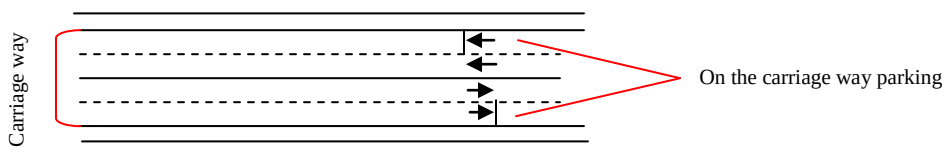
- The minimum width for access road shouldn't be less than 6m if the road has two lanes / for two way movement .

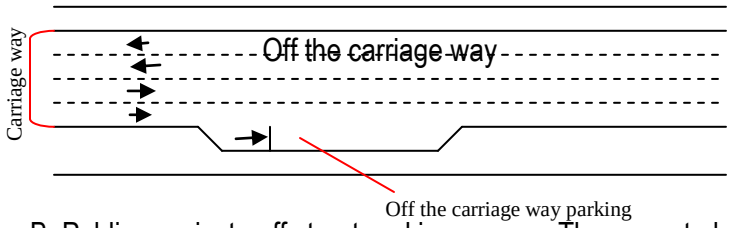
**Parking**

The building permit standard for parking space is based on the socio-economic status of the inhabitants. The housing development program concerned for the upper – low, low income and the middle income group, the ratio of 1 parking for 5 household is taken as a standard.
At global level, an emphasis being given to public transportation system, the neighborhood design should also promote public transport and pedestrian movement.

Two types of parking areas

A. On street parking spaces
   - On the carriage way






B. Public or private off street parking spaces: These are to be developed outside the right of way width of roads

Parking floor area for condominium and residential real estate buildings

| Housing typology | Floor area | Car park/household |
|---|---|---|
| High income | Greater floor space than 57.5m$^2$ i.e. 50m$^2$ (3bed rooms + WC+ Kitchen + 15% circulation = 57.5 | 1/1 |
| Middle income | 46-57m$^2$ floor space i.e. 40m$^2$ (2bed rooms+ 1 living room + WC+ kitchen)+ 15% internal circulation= 46 | 1/5 |
| Low income | 20-46m$^2$ floor space (minimum habitable area= 20m$^2$ | 1/10 |

Source: Norms & standards of the A.A. city structure plan and its components

## 7. Utility line

- Provide communal septic tank accessible to vehicle. If there is a public sewer system in the area, it is recommended to connect it with the system.
- The size of septic tank should correspond to family size

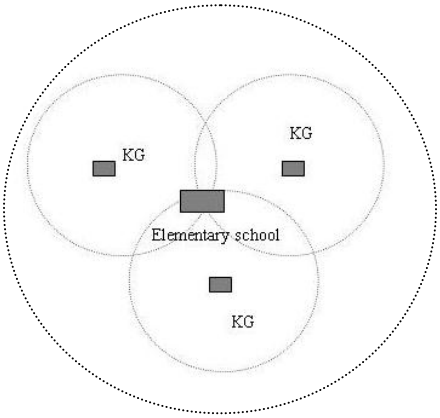
## 8. Service

To bring well-balanced and equitable distribution of services, and up to standard facilities at various levels, the neighborhood design has to analyze the existing service distribution at area level in advance.

At a neighborhood level, functions that should be available within walking distance

- Shops / shopping center
- Facilities like barber, tailor etc
- Play field
- Workshops, mill house
- Communal garbage collection & compostServices of a higher level like kindergarten, elementary school & secondary school, health centers, markets are allocated to serve a population within a certain catchment's radius. So in neighborhood design, before final decisions are made in regard to the provision of services and facilities, the area should be examined for available existing facilities.

Special care must be taken to check the capacity as well as the location of such facilities. There may be citywide / district facilities that can also be used if they provide good service and are accessible.




Provision of kindergarten and elementary school for a neighborhood within a walking distance

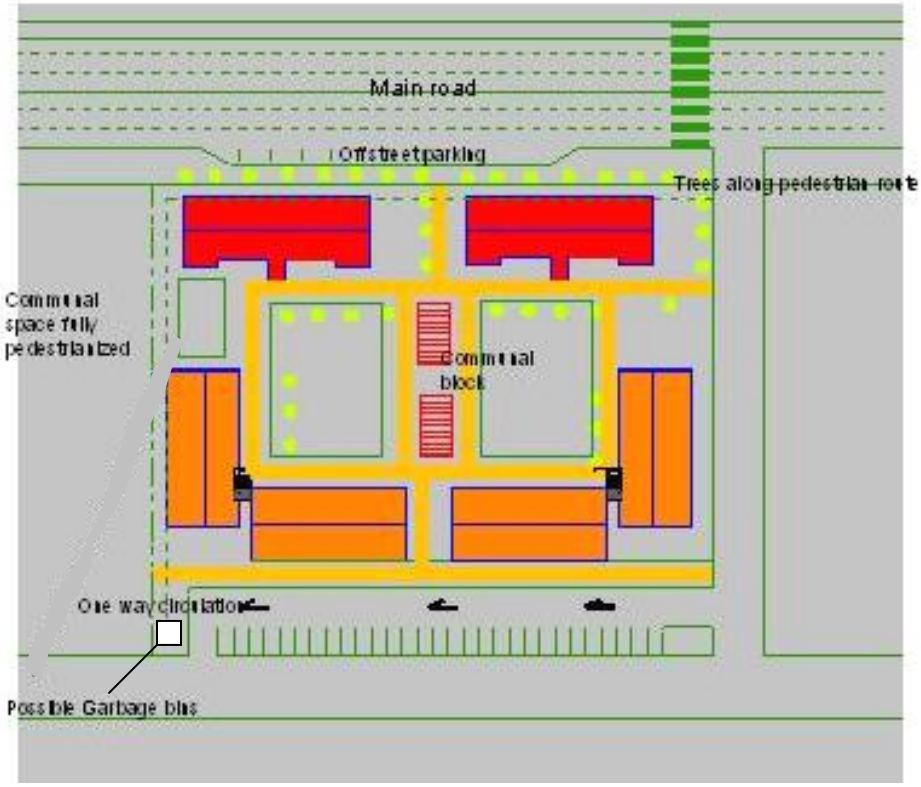
| Service | Catchments radius | | Area requirement (m2) |
|---|---|---|---|
| | Distance in Km | User population | |
| Kindergarten | 0.5 - 1 | 750 - 1000 | 2500-3000 |
| Elementary school | 2.5 -3 | 5,000-10,000 | 12000-18000 |
| Secondary school | 3 - 5 | 10,000-12,000 | 12000-30000 |

Provision of health facility for neighborhood within walking distance

| Type of health facility | Population served | Plot area $m^2$ |
|---|---|---|
| Health center | 1:25000 | 4500-6000 |
| Health post | 1:5000 | 1500-3000 |

## VII. Sample illustrations

Illustration of the application & transformation of concepts & principles into neighborhood planning & design model




- Minimum 2.50m from the boundary line
- Parking 1 to 5 household
- Vehicle access completely segregated from pedestrian free areas
- Communal blocks within minimum distance
- Access road a minimum of 6m width
- Pedestrian walkway of minimum 1.5m width in direct link to the main road for those who use public transport and in direct link to the parking
- Communal house of G+1 for each two blocks

Density 200 Household per hectare

Model for grid pattern neighborhood, which can be duplicated

- Slow street concept applied in longer local roads and streets (which are usually occurred in grid pattern development) to discourage through traffic flows and to decrease vehicle speed for encouraging and ensuring safety to pedestrian movement and non-motorized transport which is the dominant traffic type in the local roads.
- Sufficient communal space for stimulating communal activities such as sport, gardening, recreation and other social interactions
- Reduced hard surface (asphalted cover) through introduction of one way motorized traffic system within the compound
- Garbage bins and composting located at the exist and entrance easy access for garbage collectors and avoids nuisance and NIMBY (not in my backyard)
- Pedestrian oriented amenities and services along the main road such as seats, telephone booth, street vendors

# VII. Annexes

## Annex I. Neighborhood planning checklist

Neighborhood planning and design process normally involves the following steps:

1. Definition of interest and housing program
   a. Goal and objective (prepare Term of reference for a specific project area)
   b. Target population need/demand

2. Site selection
   a. Identification of alternative sites
   b. Comparison and Selection of project area
   c. Definition of the project action area and planning area

3. Data gathering and analysis
   a. Site reconnaissance (site visit, observation, taking photos)
   b. Topographic Surveying i.e base map preparation, slope analysis, drainage etc
   c. Site feature assessment of the planning[1] and action area
      i. Natural (trees, water features, landscape, slope drainage flow, soil type…)
      ii. Man made (coverage, layout, conditions, size and capacity of infrastructure network such as road, electricity, water, telephone, sewerage
   d. Conduct site analysis; strength, weakness, opportunity, threat (SWOT[2] analysis) and identification of critical issues to be addressed
   e. Service distribution analysis in the planning area and sub city level i.e. education, health, market and recreation; existing service provision, capacity
   f. Infrastructure analysis in the planning area and sub city level i.e. water, electricity, road; existing layout, capacity and possible extension

4. Develop conceptual plans for the specific site conditions
   a. Develop alternatives
   b. Compare and select the best alternative through discussion with stakeholders

5. Preparation of the neighborhood plan and design
   a. Prepare integration plan of the planning area (which basically covers beyond the selected action area)

[1] Don't forget that the planning area depend on the issue for example for drainage the whole basin area should be assessed and analyzed while for other issue the planning area might be different

i. Propose services and infrastructure provision required in the planning area based on the analysis made to serve the existing as well as the coming population
   - Extension of existing services to increase its capacity to accommodate the new development,
   - Maintenance and upgrading of existing services and infrastructure,
   - Development of new services and infrastructure;

ii. Reach an agreement through discussion, consultation and confirmation with concerned sectors on the possibility of infrastructure and service provision, such as water and sanitation sector, EEPCO, Tele so that they can develop an implementation strategy and action plan

iii. Indicate environmental mitigation measures and actions in the planning area required to protect the selected site like quarry site, pollutant industry etc

b. Preparation of the action area plan and design by considering the existing Local development plan of the area and the structure plan norm and standards
   i. Land use and road net work proposal
   ii. A neighborhood plan clearly determining the building layout with the respective building typology, communal spaces, green spaces and play grounds, parking, pedestrian layout
   iii. Infrastructure layout and design

6. Cost estimation (building construction cost, road construction cost and infrastructure
7. Organization of reference plans, Neighborhood plan & design and report (files)
8. Preparation of construction plans, specifications, and bidding documents

## Annex II. Neighborhood design checklist

1. Approved and well-dimensioned plan
    - Format hard and soft copy
    - Site visit
    - Standards to be referred
2. Surveying data
    - Dimension
    - Corner coordinates
    - Contour lines with interval 0.25meter
    - Hard and soft copy
3. Overlap planning format and surveying data presentation
    - Site plan and elevations
        - Scale 1:500, 1:200
        - North direction
        - Dimension (internal and external)
        - Type of block
        - Corner coordinates for each block
        - Land use map
        - Road network (vehicular and pedestrian)
        - Green area
        - Play ground
        - Social services
        - Car parking
        - Floor finish level
        - Street side elevation
        - Cross section for internal roads
        - Cross section for site
        - Location for power house
        - Location for water reservoir
        - Location for fire hydrant
        - Location for public telephone
    - Location plan
        - Scale 1:1000, 1:2000
        - North direction
        - Prominent places and roads
        - 2.5 Km radius
    - Title block
        - Total plot area
        - Total built up area
        - Total number of blocks
        - Total number of housing units by type
        - Total number of shops
        - Density
        - Project name
    - Assessment designing phase

- Related to road and transport accessibility
  - Vehicular and pedestrian mobility
  - Car parking
  - Road level and cross section
  - Site and road drainage
- Related to urban character
  - Block layout and density
  - Land use and height
  - Blocks ground floors functions
- Related to environment
  - Greenery
  - Waste management
  - Public/private spaces
- Related to surrounding
  - Integration plan urban design

4.Presentation materials and display outputs

a. Text design briefs
b. Plans in scale 1:500 and 1:1000
c. Plan types:
   i. Integration plan (urban design)
   ii. Detailed site plan
   iii. Detailed landscape plan and contour adjustment
   iv. Site section
   v. Detailed electrical installation site plan
   vi. Detailed sanitary installation site plan
   vii. 3D models or perspectives

## Annex II. Checklist for neighborhood level infrastructure planning and design

### Steps for planning and designing neighborhood drainage system

1. Identify the boundaries of drainage catchments in which the selected site is located
2. Establish existing drainage routes and boundaries through site visit and topographic survey and slope map of the whole drainage catchments area
3. Identify spots where flooding is a critical problem
4. Identify existing drainage networks layout, conditions, levels of existing drainage structures (ditches and culverts) cross-section and longitudinal sections and also the existing and proposed road layout
5. Estimate the surface water runoff
6. Design drainage routes and layouts with primary, secondary and tertiary drainage routes
7. Determine the proposed ditch and culvert levels on the longitudinal section plan
8. Determine the size of each drainage routes to be sufficient and accommodate the discharge amount
9. Integrate the drainage network with the main drainage network system of the city

### Steps for planning and designing neighborhood water supply

1. Assess the population size to be settled in the selected area and the proposed activities and functions
2. Estimate the quantity of water needed/ calculate the water demand
3. Identify water supply options and sources
    a. Off site sources like ground water, streams and lakes or from existing water trunk mains
    b. On site sources ground water, rain water harvesting from roof, communal water points, individual water connection

4. Check the availability/possibility of extending water supply network from the existing near by areas, whether there is a capacity to accommodate the water demand.
5. Decide the type of water supply such as public tap, individual connection and rain water harvest from roof to meet the per capita demand
6. Determine the layout of main lines and distribution network and the location of public water taps
7. Define the pressures and supply rates at supply points
8. Define nodes at all supply points and at intervals throughout the system, including all junctions between mains
9. Divide the area to be served by the system into sub areas centered on these nodes and calculate the peak water requirement for each area, including allowance for acceptable leakage
10. Define the maximum ground level in each sub area together with ground levels and heads at supply points and minimum water levels in reservoirs
11. Determine the sizes of main pipe lines and analyze the system

12. Add additional mains or alter the main sizes as necessary to obtain at least minimum allowable pressure head at all points
13. Sketch a plan of the system, showing the location of water demands and convert the system into a series of branching pipes so that demands are divided in relation to capacity of main pipelines.

**Electric power supply planning**

1. Assess the number of population to be settled and the functions and activities to be developed
2. Estimate the consumption per household and calculate the demand
3. Assess and illustrate the existing electric network the type of electric line and feeder within the planning area and the location of near by transformers
4. Determine the need for a distribution transformer and the location
5. Design secondary distributor main lines along arterials and collector roads for supplying electric to the selected site

**Steps for planning and designing road network:**

1. Assess the proposed road network plan of the structure plan and local development plans for the planning area
2. Assess the existing road network layout and width
3. Sketch the main road connections of the site
4. Design collector and local road connection following the standard spacing and the block layout and also considering the slope and landscape
5. Determine the width of each road
6. Design parking
7. Determine the ground level of the planned roads through the longitudinal section and profiles

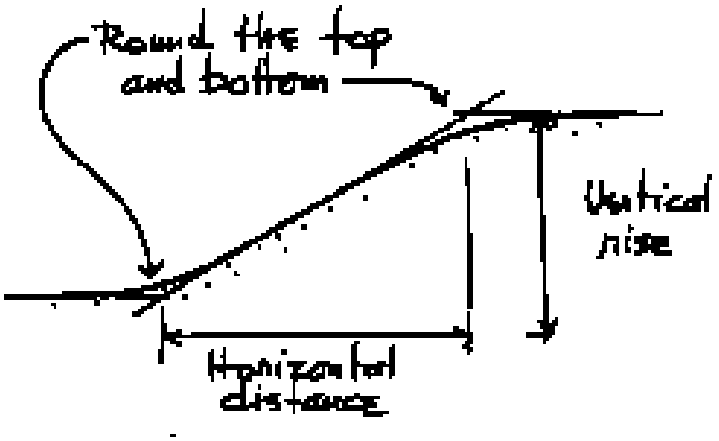
## Annex III. Site Development guidelines:

A checklist of helpful considerations on

1. Excavation and grading
2. Slopes (earth cut or fill)
3. Steps
4. Lawn and seeded areas
5. Walk way paving
6. Roads and driveways
7. Parking
8. Site Drainage
9. Site furnishings
10. Landscape planting

## 1. Excavation and grading

Keep to an absolute minimum.
Balance the on-site cut and fill
Off-site borrow or disposition is expensive.
Protect trees and established ground covers.
Remove and store the topsoil
Avoid working the soil when it is wet, powder-dry, or frozen.
Provide positive surface drainage away from buildings to levels, gutters, drain inlets, or Outer surfaces.
Reestablish ground covers without delay.
Unprotected soils cause erosion and silt.




*Most slopes are best mix together with or merge into the natural landforms.*

## 2. Slopes (earth cut or fill)

Do not exceed the angle of recline of the soils being cut or placed or a slope of 1 meter of vertical rise for 1 1/2 meter of horizontal distance.

A slope of 1 on 2 maximum is recommended for planted embankments.

A slope of 1 on 3 maximum is preferred for grassland to facilitate mowing.

Place fill material in uniform layers of 15 to 20 cm of loose material

Allow for soil shrinkage (or swelling in some instances); 3 to 5 percent shrinkage is normal in compacted fills.

Provide mechanical compaction.

Natural compaction by the eventual settlement of loosely placed soils is seldom uniform or complete.

All fills should be compacted fills, placed on prepared benches cut through topsoil and overburden.

Thrust benches and positive drainage must be provided at the base of major fills.

## 3. Steps

Avoid steps, if possible, except when they are used as a landscape feature.

Always consider the handicapped and provide alternate access ramps.

Avoid use of single steps. They are hazardous.

The risers in architectural flights of steps should be of uniform height.

In free form or naturalized flights of steps (where consistency is not anticipated), riser and tread dimensions may vary widely within a given flight.

Good footing is essential.

On concrete steps a wood float or light textured finish or the use of abrasive fines is suggested.

In rough terrain particularly, persons (as in a stepped ramp) may be desirable on slopes ranging in grade from 16 to 25 percent. These may vary in some instances with site or climatic conditions and material finishes.

## 4. Lawn and seeded areas

Provide a 1 percent minimum gradient for lawn areas (a fall of 1 unit for each 100 unit).

A 1 1/2 percent slope is preferred to ensure more positive surface drainage.

Swales should have a gradient of 1 percent minimum, 4 percent maximum. (On steeper grades a loose stone or paved gutter is required.)

Provide a 15 cm fall from buildings in the first 6-meter.

A 10 cm compacted topsoil section is considered the minimum for new lawn construction.

A 15- to 20-cm section (or deeper) is recommended when soils are impervious or overly porous or when topsoil is abundant.

## 5. Walkway paving

Provide a 1 percent minimum longitudinal or cross slope.

A slope of 1 1/2 percent is recommended for terraces.

A pitch of 8 percent is considered maximum for walks if no handrail is provided.

With a handrail, the walk way can be steeped to 15 percent (for a short ramp distance only).

Width: a confined walkway requires a minimum width of 60 cm per person for comfortable passing. A width of 1.5 meter for a typical low-volume community walk will allow three persons or one person and a baby carriage to pass. If bicycle use is anticipated (such a joint use is not generally recommended), a walk width of 1.8 meter is required for a bicycle and two persons or for two bicycles to pass.

Capacity: each 60 cm of width will accommodate between 50 and 60 persons per minute, or an average of 3300 persons per hour. This holds as well for shuffling crowds, strolling window-shoppers, or students walking briskly across a campus, since as the rate of movement increases, the person-to- person spacing increases accordingly. Rates and capacities vary with climatic conditions surface textures, and gradients. They are to be adjusted for intermittent movement as at crossings, constrictions, and counter pedestrian flow, which can reduce capacities by up to 50 percent.

## 6. Roads and driveways

In planning the approach drive or roadway consider:

Adequate sight distances at intersections

An attractive opening and entrance

Sequential revealment of views, site features, and buildings

All-weather provability and safety

Recognition of topography, sun angles, and storms

Minimum length and minimum landscape interruption

A pleasurable driving experience

Align roads and drives (and walkways) so that adjacent swales, gutters, and/or sewers will have continuous gravity flow, with minimum grading or depth of trenching.

A longitudinal gradient of 1 1/2 percent is preferred; 1 percent is considered minimum.

When flatter grades are necessary, the road must be crowned or cross-sloped to drain,

Use a dished (concave) section only in narrow lanes or minor service drives 9local roads).

All road and drive intersections should be approximately perpendicular (90 degrees).

Horizontal and vertical curvature is subject to design speed and topography.

Horizontal curves are normally true arcs.

Vertical curves are parabolic. Radii vary from 9 meters at the entrance to public roads to 180 meters or more on private drives.

On private drives and in natural areas both the horizontal and the vertical curvature may follow the topography freely without need for geometric computation. In such cases pre-located field stakes guides the grading equipment with a light touch to the existing landforms.

## 7. Parking

Allow a normal stop width of 2.5 meter to 1.8-meter minimum; 3 meter is a comfortable average.

Car stop marking is recommended.

Parking compound (two or more courts); for area-capacity calculation (approximate) allow 2.7 square meter of paved parking area per standard car, plus approach ramps, distributor loop, planting medians, turnabouts, collector walks, and buffer areas.

## 8. Site Drainage

Preserve the natural drainage ways insofar as feasible.

Prohibit concentrated surface runoff to downgrade assets

Avoid trapped water pockets.

Provide under drains at road points.

Conduct surface water by swale, gutter, or buried pipe to storm-sewer mains or outfall.

If storm inlets and lateral sewers are needed, compute the required capacity and then use the next larger size.

Keep the site drainage system unobtrusive.

## 9. Site furnishings

In the selection and placement of lighting standards and fixtures, recreational apparatus, informational signs, benches, movable tables, seating, etc., consider:
Functional suitability.
Compatibility of form, material, and finish
Durability.

Long-term cost: a higher initial expense that yields longer life with less required Maintenance is usually good economics.

Durability is to be stressed. Site equipment and furniture must be designed to withstand the effects of the elements, including sun; expansion- contraction wind stress, moisture and some tomes salt spray, frost, or ice.

Plan a coordinated *family* of shapes, materials, and finishes.

Generally use strong simple shapes, native materials and natural finishes. Black, grays, and earth

tones are basic with bright colors reserved for accent.

Standardize components such as lighting globes signposts and blanks bench slats, bolts and stains.

Invest In the best

## 10. Landscape planting

Strive always for utmost Stress quality not quantity. One well- selected, well-placed plant can be more effective than 100 plants scattered at random.

When budgets are limited, economize on the extent of the lawn and planted areas, but invest in soil quality and depth, larger plant pits, soil preparation, and provision for irrigation.

Lawn areas are best given a well-defined and pleasant shape and (in an architectural context particularly) edged with paving, curb, or mowing strip.

Install no lawn area or plant without a predetermined purpose.

Select each plant to best serve the purpose intended.

In the use of plant materials consider:
Need
Suitability
Appearance in all seasons

Appearance in all stages of growth Compatibility of form, texture, color, and association in the total building and site composition

Hardiness, cultural requirements, and degree of maintenance needed

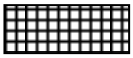
As a rule, use only indigenous or naturalized materials except for bedding plants and container-grown exotics.

Plants used for background, screening, shade, or space definitions are generally selected for strength and cleanliness of form, richness of texture, and subtlety of color.

Plants to be featured are selected for their sculptural qualities and for ornamental twigging, budding, foliage, flowers, and fruit.

They are to be placed strategically for optimum display.

## Annex IV. Major land use classification and coding of the LDP

| Land use Category | Contents of the major category | Coding | | |
|---|---|---|---|---|
| | | **Letter** | **Color** | **Black and white** |
| **Residence** | Existing housing,<br>Proposed housing | R | Yellow  | Horizontal hatch  |
| **Commerce, business and administration** | Shops, supermarket<br>Hotels, bars, restaurants<br>Banks, insurances<br>Business | CB | Red  | Normal square hatch  |
| **Services** | Education<br>▪ Kindergarten<br>▪ Primary school<br>▪ Secondary school | **S-1** | Blue  | 45 hatch  |
| | Health<br>▪ Health post<br>▪ Health center<br>▪ District hospital | **S-2** | | |
| | Sport and recreation<br>▪ play lot<br>▪ neighborhood playground<br>▪ sport field<br>▪ indoor sport activities (swimming pool, gymnasium, …) | **S-3** | | |
| **Open spaces and Environmental aspects** | Open spaces | EA-1 | Green  | Square dotted  |
| | Conservation areas | EA-7 | | |