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SCHOOL OF BUILDING AND ENVIRONMENT

DEPARTMENT OF ARCHITECTURE

SAR1401 – INTRODUCTION TO LANDSCAPE ARCHITECTURE

UNIT – I – INTRODUCTION TO LANDSCAPE

I. Introduction to landscape

What is Landscape?

Landscape: An expanse of scenery that can be seen in a single view or from a single viewpoint.

"a piece of land which we perceive comprehensively around us, without looking closely at single components, and which looks familiar to us" (Haber, 2004)

"the total character of a region" (Von Humboldt)

"a mosaic of interacting ecosystems"

What is design?

- It is the process of creation of Object/ Space/ System/ Policy
- To serve a pre-determined purpose / Objective
- To solve one or more specified problems
- To enhance the quality of environment of the delineated space

What is landscape architecture?

"art and science of planning and designing the landscape for purposeful human use and the conservation of landscape resources"

"Landscape Architecture is the design profession concerned with the design, planning, management and stewardship of the land"

American Society of Landscape Architects (ASLA)

As defined by the American Society of Landscape Architects (ASLA):

- Landscape Architecture is the design profession concerned with the design, planning, management and stewardship of the land.
- The foundation of landscape architecture education and practice is the application of ecological design in the consideration of abiotic, biotic, and cultural features in conservation, development and restoration projects.
- The goal is to achieve environmental, social or aesthetically pleasing spaces by investigating existing social, ecological and geological conditions in the landscape.
- The work of landscape architects is all around us in the form and function of the land: the work often touches on urban design, site planning, storm water management, urban planning, restoration, parks and recreation planning, green infrastructure planning and private or residential master planning and design.
- Those who practice the profession of landscape architecture are called "landscape architects".

Field of landscape design

Behavioral sciences

- Psychology
- Sociology
- Spatial
- Aesthetics
- Experience

General sciences

- Plant science
- Climate
- Environmental science
- Chemicals

Engineering and technology

- Soil
- Drainage
- Construction
- Materials
- Light

Behavioral sciences: People will experience landscape; they will enjoy or criticize it. So people are psychologically involved once they see a landscape. If a person enjoys landscape it's a behaviorally positive result, if they don't enjoy it's a behaviorally negative result.

General sciences: Once a person enters a park, they can experience a lot of plantations around them, a water body, sand, boulders, play of light and shadow, a difference in the micro level of the climate. All these will be concerning to the general sciences. So whether one like it or not, people cannot be devoid of these elements.

Engineering and technology: When the execution of a designed landscape or alteration to a natural landscape, the various technology comes in. In the absence of a proper engineering and technology, no landscape would be perfect.

Behavioral sciences

Psychology

- Peoples connect their reactions and behavior of mind when they experience a landscape.

Sociology

- When people experience landscape, different age groups-toddlers to old people and different group of people of all background are involved. It becomes a hub for sociological communication interactions.

Spatial

- The space, how it works, what is the shape and size of it, what is the dimension of the space, what is the volume and there are multiple components within the space.

Aesthetics

- The state of mind when you enjoy a landscape. It examines subjective and sensory-emotional values, or sometimes called judgments of sentiment and taste.

Experience

- Experience is the effect or influence gained through involvement in or exposure to it. It is the take away by the users through the exposure to certain landscape

General sciences

Plant science

- Majority of a landscape is covered by plants, the most important elements of a landscape. Plant science a single part of the large domain.

Climate

- To support all the major elements in a landscape, climate is the most important factor. Rain, amount of sun rays a place receives, wind flowing all these factors come as a part of the climate.

Environmental science

- The surroundings or conditions in which a person, animal, or plant lives or operates. It is a totality. There are multiple interacting eco-systems in an environment.

Chemicals

- The nutrients that a plant needs, fertilizers added to the soil, pollution created to the surroundings, emission of varies gases from industries all these alters the compositions.

Engineering and technology

Soil

- The entire landscape is spread over the surface of the earth, its stability, its condition, its physical & chemical conditions and how ground modelling is done comes under this.

Drainage

- Areas which are exposed to the rain water or to storm water or exposed to the dew or fog, near a water body will add to the precipitation level or to the water content. These factors will concern drainage.

Construction

- When something is created or altered construction has to be done. When construction has to be done, all the implements of construction, its machineries will come under this.

Materials

- Vegetation of different forms, ground cover, the terrain cover, elements such as pathways, fencing, water body, seating's etc., are made up of multiple materials and constitute to the major part of the landscape.

Light

All the landscape is experienced in different seasons, different time of a day which are has various lighting exposure both natural and created. They define the person's experience to the place.

Categories of Landscape Design

1. Landscape derived directly from natural habitat of the region
2. Man's alteration of the natural habitat for his own use
3. Landscape deliberately designed for a purpose

1. Landscape derived directly from natural habitat of the region

- They exist in their purest form only where man is absent or in the areas of least human intervention

Figure 1.1 Forest, Coast, Desert, Open meadow

2. Man's alteration of the natural habitat for his own use

- With or without major consideration or concern for the natural settings and its elements.
- Introduced to accommodate or solve a certain issue or requirement.
- Introduction of elements may sometimes result in mesmerizing landscape, which can be a planned or an unplanned activity.

Figure 1.2 Farmlands replaced by original landscape

3. Landscape deliberately designed for a purpose

- A landscape designed and created intentionally by man for a specific purpose.
- The character of the designed landscape helps to define the image of the people who inhabit it and a sense of place that differentiates one region from other and the activity that surrounds the place.

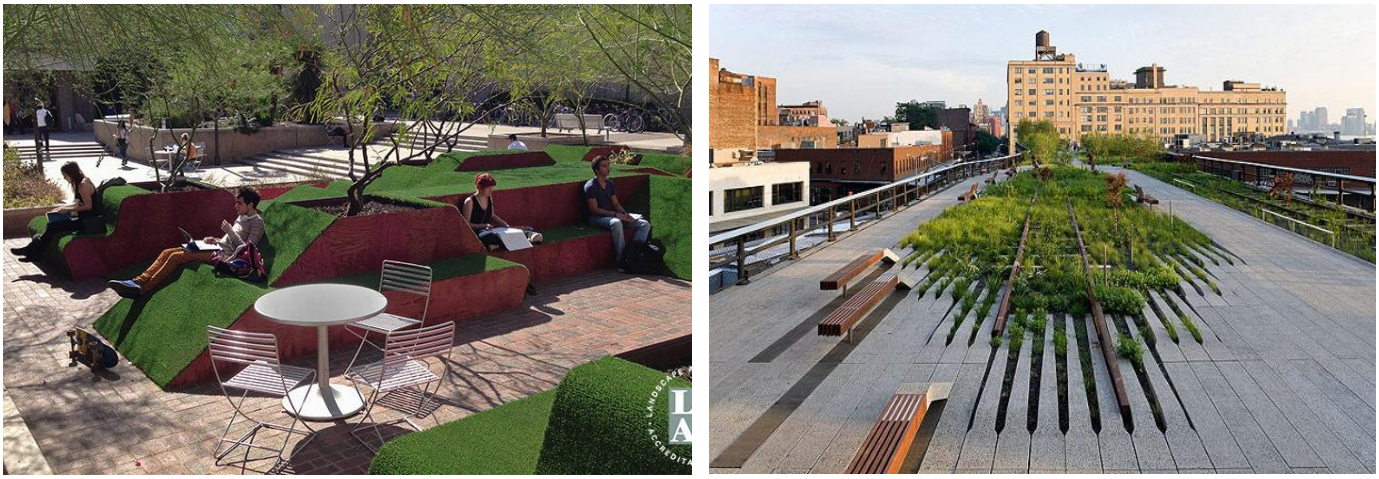


Figure 1.3 landscape design for a purpose

Professional Scope of Work includes

Architectural landscape design
Site planning
Housing estate development
Environmental restoration
Town or urban planning
Urban design
Parks and recreation planning
Regional planning
Landscape urbanism
Historic preservation.
Landscape Conservation

Role of Landscape Architects

- The planning, form, scale and siting of new developments.
- Storm water management including rain gardens, green roofs and treatment wetlands
- Campus and site design for institutions
- Parks, botanical gardens, arboretums, greenways, and nature preserves.
- Recreation facilities like golf courses, theme parks and sports facilities.
- Housing areas, industrial parks and commercial developments.
- Highways, transportation structures, bridges, and transit corridors
- Urban design, town and city squares, waterfronts, pedestrian schemes, and parking lots.
- Large or small urban regeneration schemes.
- Forest, tourist or historic landscapes, and historic garden appraisal and conservation studies.
- Reservoirs, dams, power stations, reclamation of extractive industry applications or major industrial projects.
- Environmental assessment and landscape assessment, planning advice and land management proposals.
- Coastal and offshore developments.

Landscape Interpretation

- Interpretation of landscape has been theorized in a number of ways. The concerns primarily interpretations from socio-cultural relations, emotions and interpretations of environmental processes.
- Landscape interpretation amounted essentially to the explanation of how natural and cultural forces combined in shaping environments.
- Attention to the importance of the human subject and cultural values stimulated a wide-ranging scholarly engagement with interpreting landscapes within their shifting societal contexts as places of, aesthetic pleasure, cultural value, spiritual refuge, ordinary experience, or alienation

Landscape as Nature

Figure 1.4: A natural landscape from Leh showing the varying seasons

A natural landscape is a landscape that is unaffected by human activity. It is intact when all living and nonliving elements are free to move and change. The nonliving elements distinguish a natural landscape from a wilderness. A wilderness includes areas within which natural processes operate without human interference, but a wilderness must contain life. As implied, a natural landscape may contain either the living or nonliving or both.

Landscape as Habitat

Figure 1.5: Coral reef in the Phoenix Islands,

Figure 1.6 : Ibex in alpine habitat

In ecology, a habitat is the type of natural environment in which particular species of organism lives. It is characterized by both physical and biological features. A species' habitat is those places where it can find food, shelter, protection and mates for reproduction.

Landscape as Artifact

Figure 1.7: Ancient stone vessels spread across the old Basilica and Plain of Jars in northern Laos

Figure 1.8: View of Volubilis, the Capitoline Temple

Artifacts are implied as elements of landscape showing human workmanship or modification as distinguished from a natural object especially an object remaining from a particular period showcasing various timeline, culture and environment.

Landscape as System

Figure 1.9: Pichavaram showing mangrove system

Figure 1.10: The Thar Desert

A landscape system is the collection of interconnected ecosystems, which is always open to inputs and outputs, such as a set of wetlands connected by runoff. The successful integration of ecosystem ecology with landscape ecology would be conducive to understanding how landscapes function.

Landscape as a Problem / Challenge

Figure 1.11 Poor maintenance blocking the culvert drain

Land pollution is nowadays a major problem into landform which creates various hazardous effects to the environment. Waste landscapes or derelict landscape, disturbed landscape, land that needs regeneration and reclamation, brownfields are some of the landscape challenges that need to be addressed.

Landscape as Ideology

Figure 1.12 : A theme created in the existing landscape to create awareness

With an intention to help raise awareness about the world's shrinking forests, artist Konstantin Dimopoulos 'paints' trees in urban areas, most recently in Seattle and Kenmore, Washington state. Colored with azurite (a blue rock) and water that will eventually fade and wash away, the project's trees are supposed to draw attention.

Landscape as Wealth

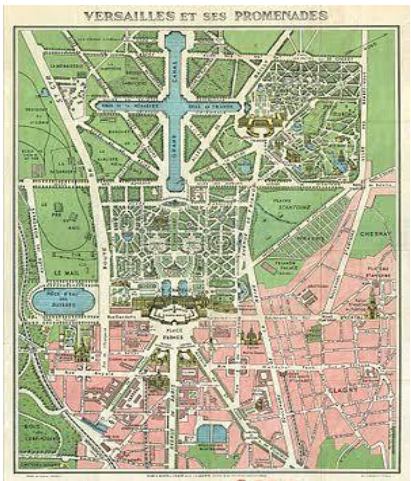


Figure 1.13 : The Gardens of Versailles , Palace of Versailles

Landscape considered as aesthetic expressions of beauty through art and nature, a display of taste or style in civilized life, an expression of an individual's or culture's philosophy, and sometimes as a display of private status or national pride showcasing the wealth of the person/ culture/ community/ nation.

Landscape as History

Figure 1.14 : Stonehenge, Historical landmark in England

The complex cumulative record of the work of nature and man gives a picture of the written record and deep into the natural evolution of the history and geology. These landscapes will act as a record to the evolution of mankind, the culture belief and their relationship with the environment.

Landscape as Place

Each landscape needs to define the character of the place and its relationship with the surrounding elements. Eg. Urban landscape, gardens, plazas. An appreciation for the everyday landscapes (vernacular) that citizens create out of their social, economic and environmental needs. Eg. Farmers market.

Figure 1.15: Hud Plaza, Washington, USA

Figure 1.16: MAGOK central plaza

Landscape as Aesthetic

Figure 1.17: The Garden of Cosmic Speculation by Charles Jencks emphasizes artistic form and uses it to suggest the influence of cosmic forces on the landscape.

Figure 1.18 : Landscape pleases the eyes by means of high water jets, land art and colors in outdoor areas. The courtyard with bubbles made out of used compact discs.

Hard And Soft Landscape Elements

- The elements of landscape design will fall into the broad categorization of hard and soft scape elements.
- Soft Landscaping and Hard Landscaping are essential elements of a landscape design. There is a requirement of a good mixture of soft as well as hard landscape materials for a proper well-built landscape design.

Hard Landscape:

- Hardscape or Hard Landscape refers to the heavy elements of a Landscape design like stone, rocks or driveways.
- The construction materials used in the design of landscape elements or to make outdoor structures come under hardscape.

Soft Landscape:

- The Softscape or the Soft Landscape is the living part of your landscape structure.
- The plants, the lawns, the trees and the shrubs make up the components of Soft Landscape.
- For example, materials required to build a pond in a garden area are components of Hard Landscape; however, the Pond itself is a part of Soft Landscape.

Pavements:

- Pavement in construction is an outdoor floor or superficial surface covering. Paving materials include asphalt, concrete, stone such as flagstone, cobblestone, setts, artificial stone, bricks, tiles, and sometimes wood.
  In landscape architecture pavements are part of the hardscape and are used on sidewalks, road surfaces, patios, courtyards, etc.

Types on the basis of subgrade:

- The pavement material receives traffic wear and transfers load to the base and subgrade.
- Pavements are classified as being either flexible or rigid. Additionally, they are porous or non-porous.

1. Flexible Pavements:

- Flexible pavements commonly have thin wearing surfaces and relatively thick aggregate basis and sub-bases. A thick aggregate base will distribute design loads over a greater subgrade area and will limit subgrade deformation potential. These pavements are appropriate in cold climates and in clay subsoil areas due to the capacity to move uniformly during swell and shrink cycles.

2. Rigid Pavements:

- In rigid pavements (i.e. reinforced concrete), loads are distributed internally within the rigid pavement and transferred to the subgrade over a broad area. These pavements are suitable in areas that contain uniform subsoil with moderate bearing capacities.

3. Porous Pavements:

- Porous pavements are a class of pavements structured to allow precipitation runoff to drain freely though the pavement surface and aggregate base. Porous pavements may perform more effectively in cold climates.

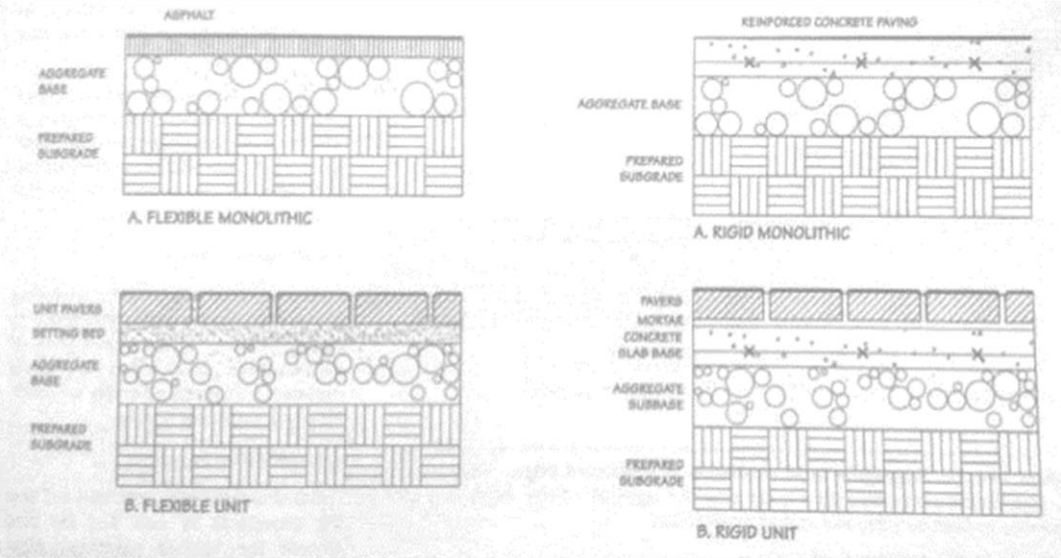


Figure 1.19 : Flexible and rigid pavements

1. In-situ Paving:

- Concrete: It is easy to pour concrete and pattern imprints it, which makes design patterns versatile. Concrete can stand abrasive materials and different climatic conditions.
- Asphalt: Asphalt is flexible, built in multiple layers and provide smooth surface to pavements. Asphalt pavements are load bearing and are easy to construct and maintain.
- Synthetic Surfacing Systems: Can be designed for specific purpose (e.g.. Court games, track) More resilient than concrete or asphalt.

Figure 1.20 Concrete pavements

2. Unit Paving:

- Bricks: Bricks provide non-skid surface. Bricks can be use anywhere due to their small size; they can be laid to strong flowing curves.
- Tiles: Tiles provide polished appearances (indoor/outdoor)
- Granite: Granite can support heavy load. They are durable, flexible and easy to clean.
- Limestone: Easy to work with. Rich color and texture.

Fig 1.21 Brick pavements

Fig 1.22 Tile pavements

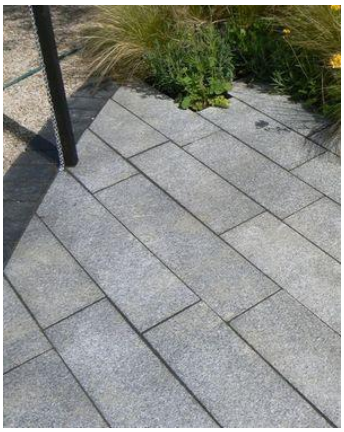


Fig 1.23 Granite pavements

3. Soft paving:

- Aggregates: Economical surfacing material. Available in wide range of colures.
- Organic materials: Compatible with natural surroundings.
- Turf: Good drainage characteristics. Ideal for many types of recreations.

Figure 1.24 Aggregate pavements

Figure 1.25 Turf pavements

Fences:

- A fence is a structure that encloses an area, typically outdoors, and is usually constructed from posts data connected by boards, wire, rails or netting.
- In landscaping, fencing can be done for decorative purposes to enhance the appearance of a property, garden or any other space.
- The widely used materials for fencing are wood and metal. Nowadays, vinyl is also used in some places.

Structural elements:

1. Basic structural frames
2. Horizontal Boards
3. Post and Rail construction
4. Pickets
5. Board Frames
6. Panels
7. Gates

Retaining Wall:

- Retaining walls are often designed when the terrain is sloped and soil has to be restrained.
- In landscaping, retaining walls help to make sure that soil is bound between the levels of a hill side and create spectacular and picturesque views.
- Retaining walls can be simple or complex – boulder walls, stone walls, wood, concrete, etc. can be used as materials.

Figure 1.26 Stone retaining wall

Figure 1.27 Screen block retaining wall

Pedestrian Bridges:

- Pedestrian bridges are structures built in the landscape to allow movement across areas that would otherwise be difficult or dangerous to traverse.
- Bridges become a necessary means for connecting two points in the presence of obstacle as water, steep topography, or major roadways.

Types of pedestrian bridges for the design of short span foot bridges:

1. Log footbridge
2. Sawn timber footbridge
3. Galloway timber footbridge
4. Galloway steel footbridge
5. Steel beam footbridge
6. Suspension bridge

Figure 1.28 Natural footbridge

Figure 1.29 Wooden footbridge

Seating's:

- Landscape is for relaxing and an important part of relaxing is the seating, they come in all shapes and sizes.
- Seats should be capable of snoozing in, reading the paper, a book, sewing, or just relaxing to take in the vista.
- Seats can be made or metal, timber, bamboo, wicker, rope (hammock) and concrete.

Figure 1.30 Seating

Pergolas:

- It is important vertical element, an arched structure in a garden or park consisting of a framework covered with climbing or trailing plants. An outdoor garden feature forming a shaded walkway, passageway, or sitting area of vertical posts or pillars that usually support cross-beams.

Figure 1.31 Pergolas

Gazebo:

- A gazebo is a pavilion structure, sometimes octagonal or turret shaped, often build in a park, garden or spacious public area.
- It may be simply being a place to sit and admire the view, sheltered from the weather.
- It is usually made up of wood, bamboo, vinyl and metals like aluminum, wrought iron or steel, brick and stone work.

Figure 1.32 Pergolas

Lightings:

Landscape lighting add safety, security, mood and drama to the outdoor environment. Lighting changes, the environment, various effects can be achieved:

1. Down lighting
2. Up lighting
3. Path lighting
4. Washing
5. Cross-lighting
6. Accent-lighting
7. Silhouetting
8. Spot-lighting
9. Underwater lighting
10. Step/ deck lighting
11. Sculpture lighting
12. Grazing light

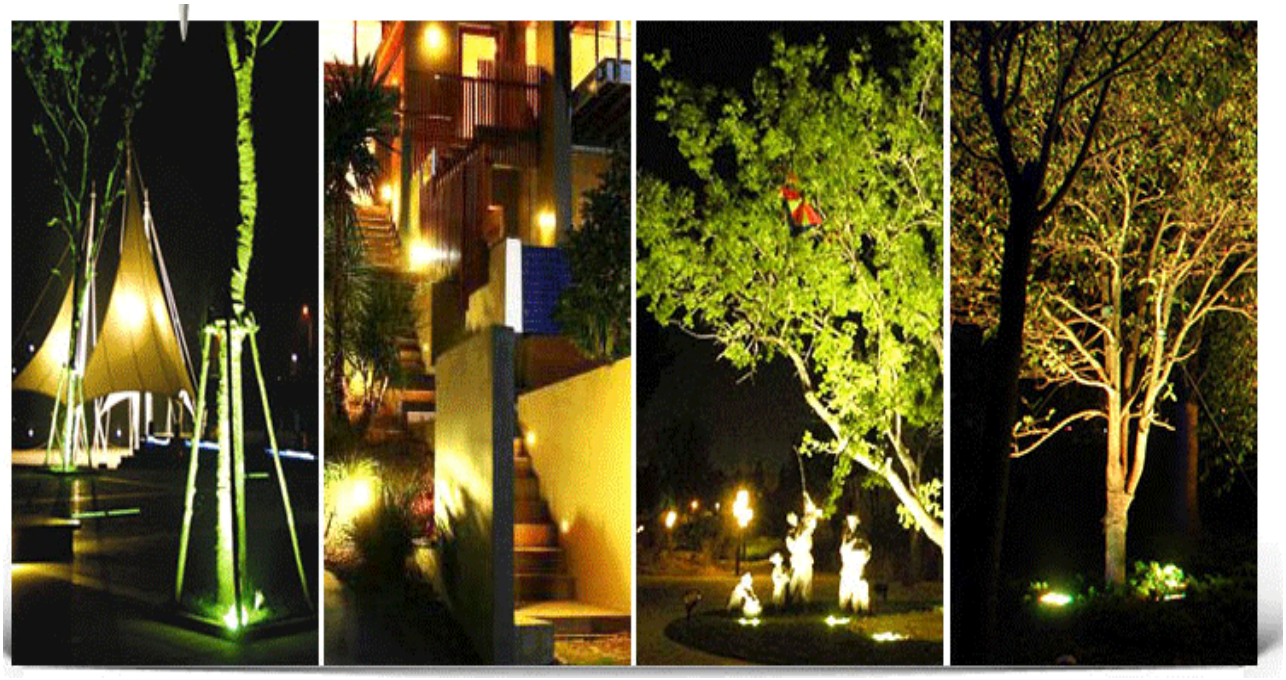


Figure 1.33 lighting

Water Feature:

In landscape architecture, a water feature is one or more items from a range of fountains, pools, ponds, cascades, waterfalls and streams. A water feature may be indoor or outdoor and can be and size, from desktop water fountain to a large indoor waterfall that covers an entire wall in a large commercial building.

Water features can be made from any number of materials, including stone, granite, stainless steel, resin, iron, and glass.

1. Still Water: The container defines the form assumed by the water. The finish of the underwater surfaces and the condition of the water at the surface influence the ultimate effect.

2. Spouting water: Spouting water relies on externally applied force to direct water through a nozzle and, working with gravity, forms a jet of some configuration. E.g. Fountain

3. Free-falling water: Freefalling water moves vertically without contacting any surfaces and is most often expressed as a full sheet.

4. Flowing water: Flowing water is constantly in contact with the container. A vertically oriented flow creates a water fall.

5. Cascading water: Cascading water is a combination of flowing water, falling water and dry areas.

Figure 1.34 Still water feature

Figure 1.35 Spouting water feature

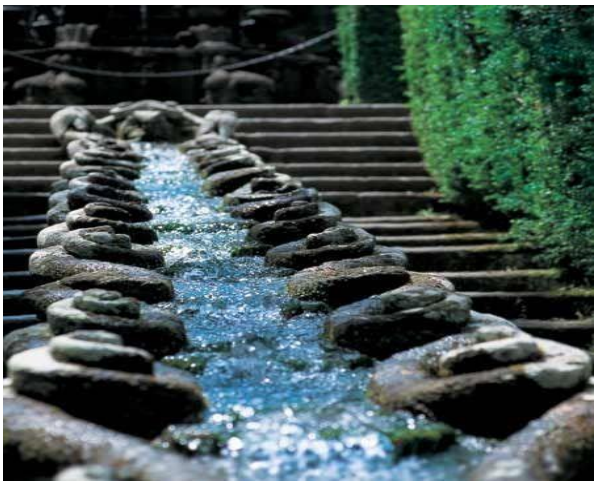


Figure 1.36 Flowing water feature

Figure 1.37 Cascading water feature

Figure 1.38 Free falling water feature

Softscape / Soft Landscape Elements

Trees:

- Trees are an important part of landscaping. When thriving they make a beautiful contribution to the landscape. Adding trees to your landscape, whether it is one specimen tree or a grouping of a certain variety, will greatly improve the appearance and ecological value of the area.
- They define spaces, marks boundaries, acts as landmarks, gives a sense of place and also acts as shade giving element.
- They provide enclosure, gives privacy, camouflage with the surroundings and gives direction.
- It also forms linkages between one building to another forming avenues and creates network of tree lined streets.

Improves air quality, provides shade and shelter, reduce noise level and contribute to habitat creation.

Trees:

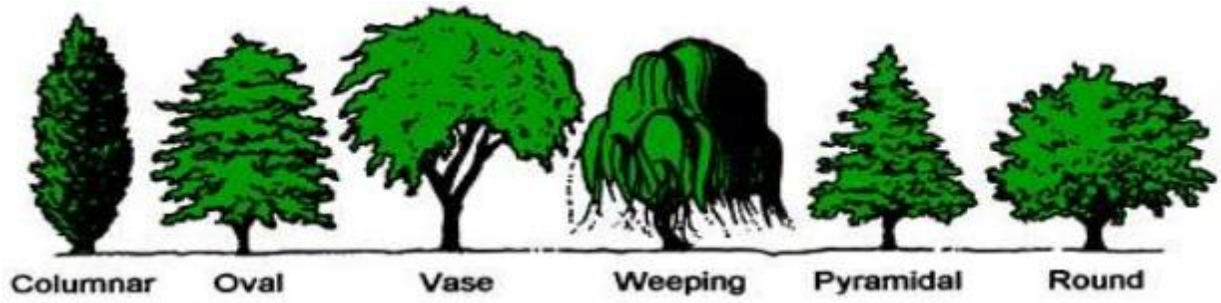


Figure 1.39 Structural Quality Of Trees

Figure 1.40 Avenue of Trees

Softscape / Soft Landscape Elements

Shrubs:

- Shrubs diversify the landscape and give variety to it horizontally.
- It is a good source of food and cover for wildlife on a smaller scale.
- It also provides cover for shade loving plants.
- It can be used to demarcate boundary, give buffer between spaces and give a sense of place.
- It gives free vision and movement.

Figure 1.41 Horizontal characters with shrubs

Figure 1.42 Shrubs giving boundary

Grass:

- Grass, any of many low, green, non woody plants belonging to the grass family (Poaceae).
- They make good ground cover
- They provide variety of texture, color and serve as a transition between two different vegetated areas such as from a shrub to a flower bed.
- Ornamental grasses add experience to the landscape.
- Helps the surrounding by preventing soil erosion.

Flowers:

- A flower, sometimes known as a bloom or blossom, is the reproductive structure found in flowering plants.
- They add color and texture to the landscape defining the mood or the context in which it is set in.
- Alters and plays with the aesthetic feel of the area.
- The add value to the place with their interaction with surrounding flora and fauna.

The Profession of Landscape Architecture Is Diverse in Practice Type.

- Landscape Design
- Site Planning
- Urban landscape design
- Landscape Planning
- Environmental Restoration

Landscape Design Process

1. Site Study

- Topography map
- Water map
- Soil map
- Vegetation map
- Climatic map

2. Site Analysis and Zoning with Major Site Requirements

3. Access

- Pedestrian movement
- Vehicular movement

4. Decision Making

- Preservation and conservation of environment (prevent cutting of 100 years old tree in the site). Try to include it as design element.
- Exploit the nature into the site through views. (View points).

5. Landscape Master Plan

- Landscape Character - Gardens, Play courts, Streetscapes, Courtyards
- Landscape design - detailing's.

Landscape Planning

- Landscape Planning is defined as an activity concerned with reconciling competing land uses while protecting natural processes and significant cultural and natural resources (Erv Zube).
- Procedures in Landscape Planning - Four Stages in the process
- Survey and Analysis
- Evaluation/ Assessment
- Policy or Design Solutions
- Implementation

Landscape planning projects

- are of broad geographical scope;
- concern many land uses or many clients;
- are implemented over a long period of time.

Three classes of Information

1. Socio-economic and Cultural Factors
2. Landscape- Ecological Factors
3. Visual Appearance (represents the interaction of 1 and 2)

Overlay Analysis

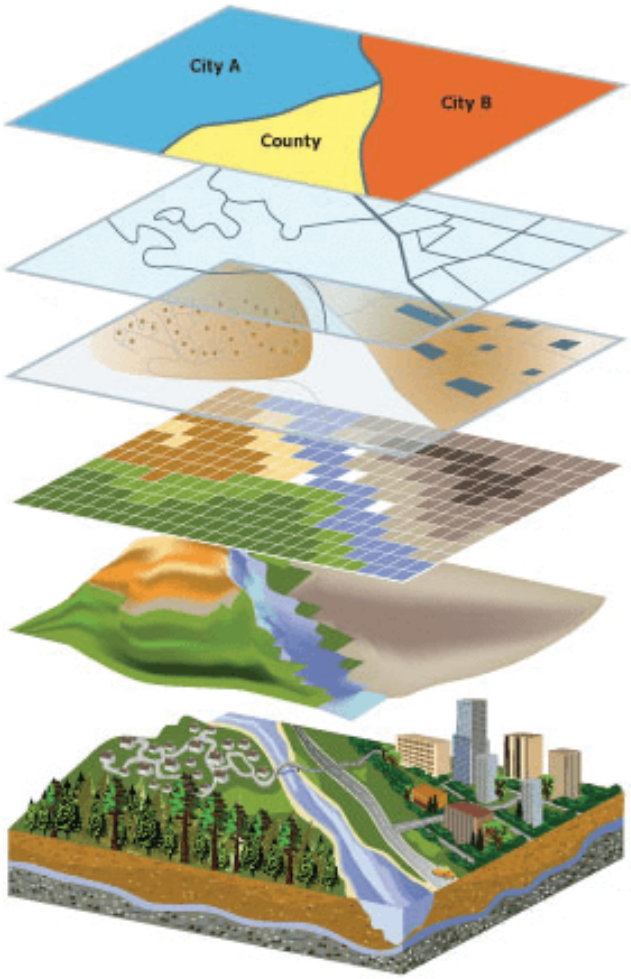
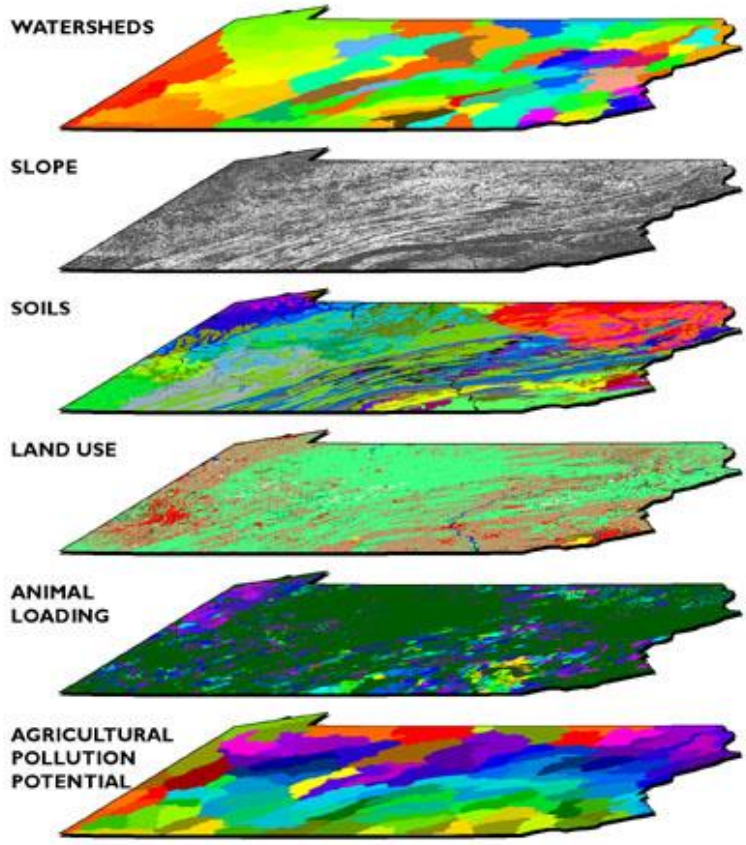


Figure 1.43 Overlay Analysis



Landscape Planning

Areas of activity

- Environmental Inventory
- Opportunity and Constraint
- Site Assessment
- Land capability / Sustainability/ Carrying Capacity of a region/site
- Hazard Assessment and Risk Management
- Forecasting Impacts
- Restoration planning
- Site Selection
- Facilities Planning
- Management Planning
- Master Planning

Methodology

The conventional planning process is a linear progression of activities. The common steps are:

- Identification of problems and opportunities.
- Establishment of goals.

- Inventory and analysis of the biophysical environment.
- Human community inventory and analysis.
- Development of concepts and the selection of options.
- Adoption of a plan.
- Community involvement and education.
- Detailed design.
- Plan implementation.
- Plan administration.
-

Landscape Conservation

Threats to Landscape

- Accelerated climatic changes have magnifying impacts on water and land resources, agricultural and biological diversities. Unprecedented scale, pace and complexity of resource management challenges-
- Habitat loss, fragmentation, degradation
- Invasive species
- Contaminants
- Hydrological impacts

Conserve the Ecosystems by reducing the disturbances given to

- Terrestrial
- Aquatic
- Protection of water resources
- Conservation of disturbed landscape
- Includes the Conservation of Cultural landscapes
- Conserve old, historic Ancient reminiscent (Ajanta ellora caves, rock cut arch. Temples, Masjid, Churches.
- Maintenance the Ecological corridors, heritage corridors

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DEPARTMENT OF ARCHITECTURE

SAR1401 – INTRODUCTION TO LANDSCAPE ARCHITECTURE

UNIT – II –HISTORY OF LANDSCAPE ARCHITECTURE

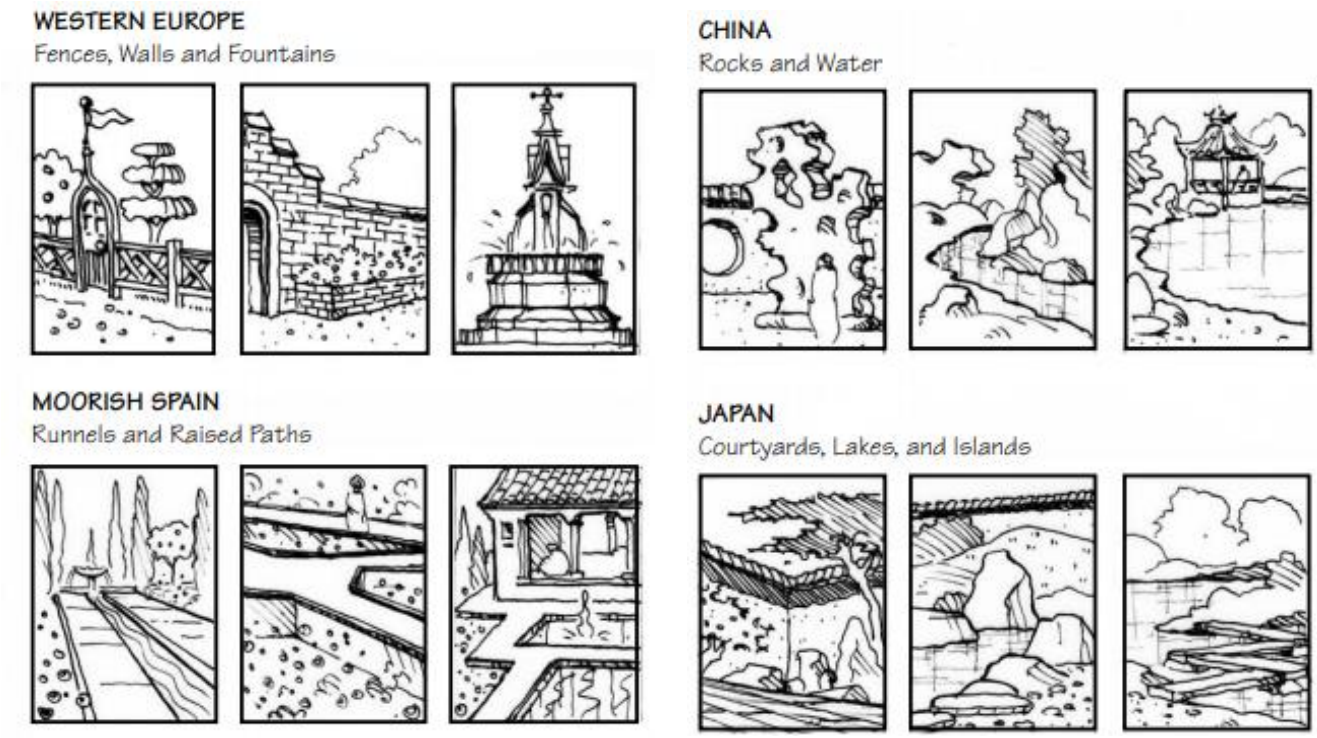
Pre History – 6TH Century

- Early cultures attempted to re-create or express the sacred meanings and spiritual significance of natural sites and phenomena.
- People altered the landscape to try to understand and/or honor the mysteries of nature.
- Early "landscape design" elaborated on humankind's intuitive impulse to dig and to mound.
- Our ancestors constructed earthworks, raised stones, and marked the ground, leaving traces of basic shapes and axial alignments.
- Cosmological Landscapes characterizes prehistoric earthworks and patterns.
- Ancient Gardens describes early parks and villas.
- Landscape and Architecture illustrates temple grounds, buildings, and important site plans.
- Genius Loci depict sacred landscape spaces.

6TH – 15TH Century

- The term "Middle Ages" applies to a period from the 6th to the 15th centuries, when cultural advancement in western Europe was disrupted by the decline of Roman to when the power structures of antiquity were replaced by the humanist ideologies of the Renaissance.
- While progress in western Europe paused, other cultures continued to thrive such as the great gardens of China, Japan, and Islamic Spain.
- During these nine centuries, enclosed gardens / walled gardens shut out the uncertain dangers of the surrounding landscape.
- Medieval gardens can be understood as metaphorical constructions, representative of a culture's changing perceptions of nature.

6TH – 15TH Century



15TH Century

- The 15th century was an age of exploration—a period of expansion and cultural advancement that proceeded at a different pace, across the world.
- Europe emerged as a world power, with Italy at the center of early Renaissance thought.
- As horizons broadened, gardens became places to contemplate nature, not escape from it.
- Garden prototypes established during the Middle Ages reached maturity in the 15th century.
- The Zen garden became the ultimate expression in Japan; the "Chahar bagh" epitomized Islamic garden form; and the Italian villa evolved as the physical representation of a philosophical ideal.

Figure 2.1 Illustrative Ideologies in Landscape from 15th Century

17TH Century

- 17th century is often described as the beginning of the Age of Reason, a period when advances in scientific knowledge challenged beliefs in religious belief.
- Nature was shaped according to human will, and typically by royal privilege.
- As settlements expanded, native populations suffered and ancient life ways started to disappear.

- The idea of extension applied not only to geopolitical influence: gardens merged into the landscape with vistas to endless horizons. Large-scale views were part of the drama and idea of mobility that characterized Baroque styles.
- The earth was no longer the static center of the universe but part of a system in motion around the sun. Politically and culturally, emphasis shifted to France, where the garden became a venue for spectacle.

Figure 2.2 Illustrative ideologies in landscape from 17th century

18TH Century

- The great advances in science and technology that defined the Enlightenment changed the way people viewed their place in the world. Scientific progress shed new light on social relations.
- The rise of the middle class as an economic and political force brought about the collapse of the ancient regime.
- England became the force that shaped garden history in the 18th century. The English "landscape" garden created a new lens through which we see nature.
- The influence of Chinese garden styles on English trends is the effect of the landscape garden on early American landscape design.

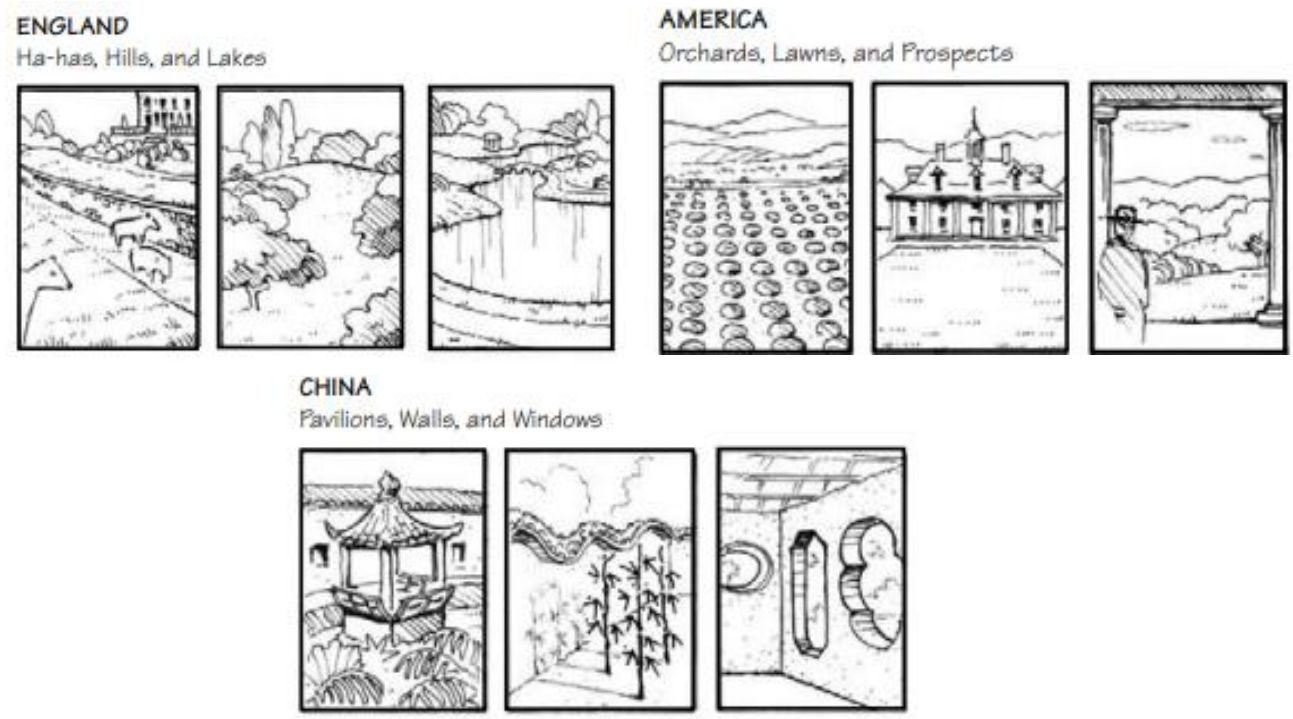


Figure 2.3 Illustrative ideologies in landscape from 18th century

19TH Century

- The Industrial Revolution eroded agrarian society. People moved into cities to supply the labor force required by factories.
- Industrial production defined the social, economic, and political order of the western world in the 19th century.

- For the middle class, emotion triumphed over reason, imagination was prized more than cultivated scholarship, and nature was elevated as the source of inspiration.
- Society believed sensitivity to natural phenomena and appreciation of natural beauty to be morally and spiritually uplifting.
- The 19th-century landscape was urban, public, and Romantic.

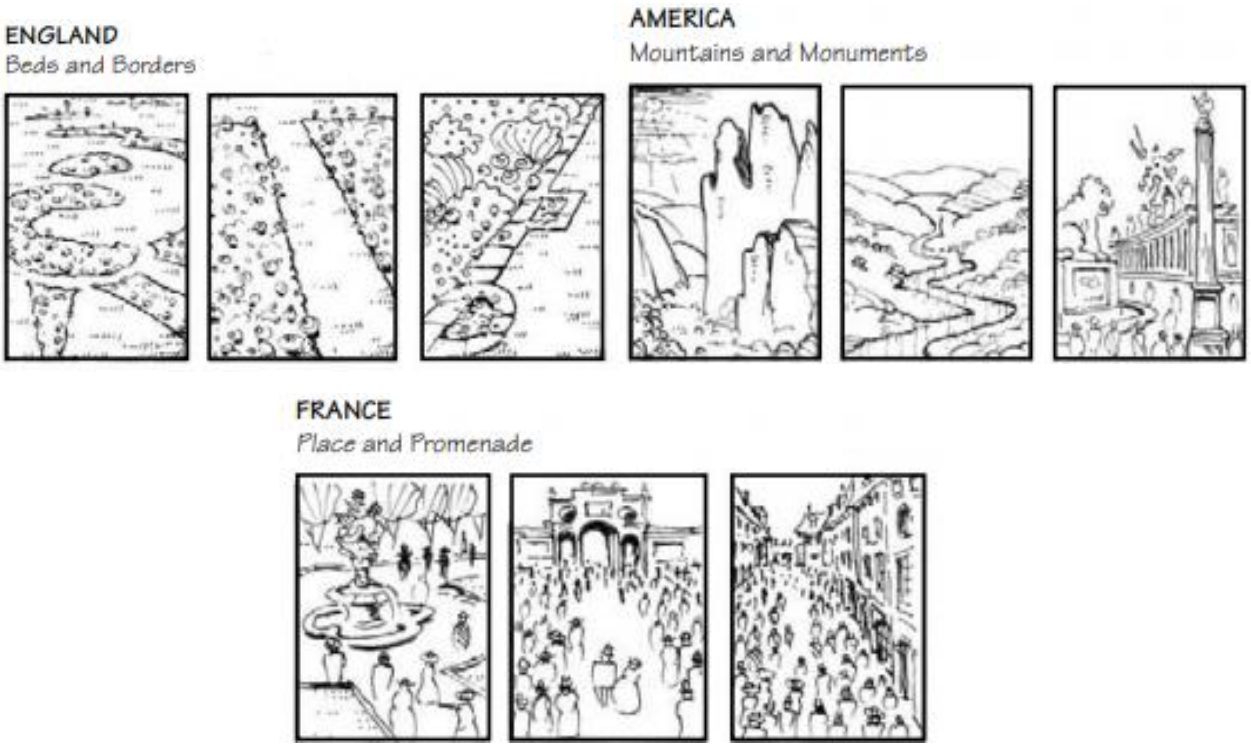


Figure 2.4 Illustrative ideologies in landscape from 19th century

20TH Century

- Over the course of a century, the world saw the biggest wars ever fought, the fastest speeds ever achieved, an enormous growth in population and migration, the formation of "superpowers," and massive devastation to the Earth in terms of species extinction and climate change.
- While communication and transportation systems seemingly shrunk the world, the distance between industrialized societies and developing nations remained great.

- Western culture reached new heights of complexity in the 20th century. Influences on the built landscape were tremendously diverse.
- No single style or approach represents the age. The development of the profession of landscape architecture accelerated in the early 20th century, particularly in America.
- Significant movements that affected American landscape design include the Country Place Era, the City Beautiful Movement, Modernism, Land Art, Environmentalism, Postmodernism and Ecological Design.

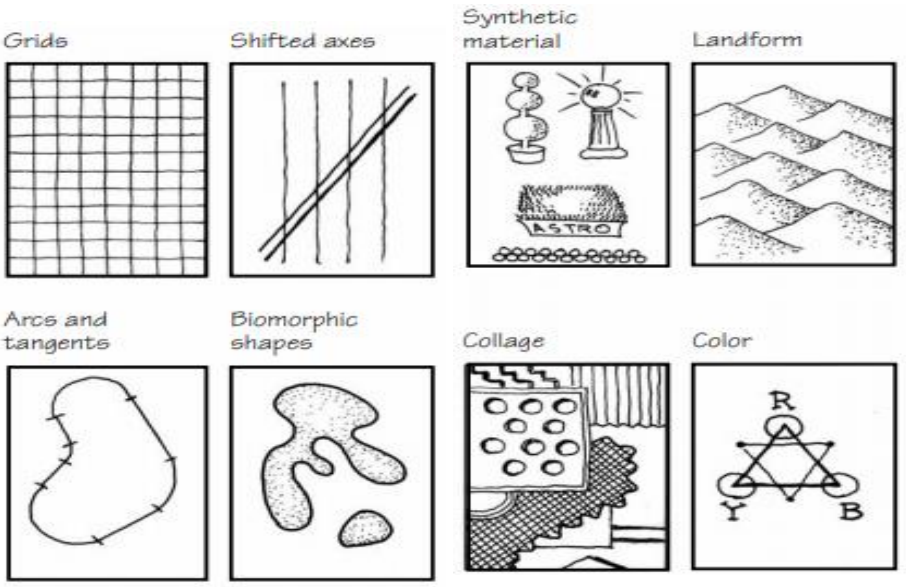


Figure 2.5 Illustrative ideologies in landscape from 20th century

21TH Century

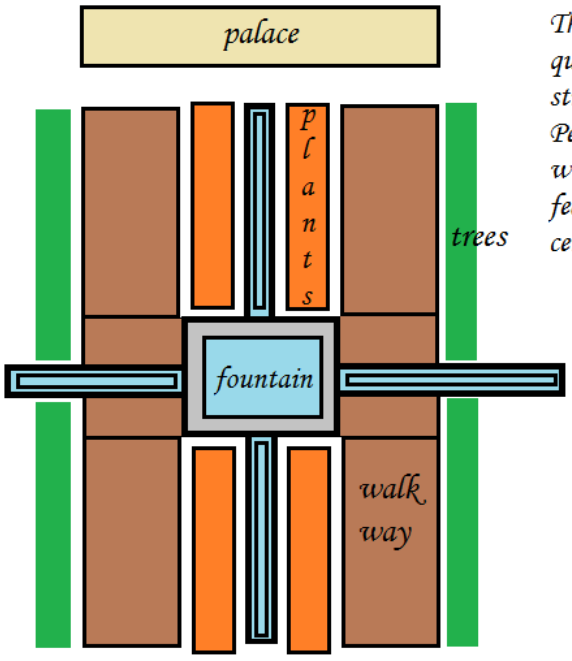
- The at the moment is "green"; what started as a countercultural movement has now become mainstream. Everything is green.
- Sustainability is a buzzword. One hopes that this trend will be permanently instilled into the global consciousness and become the origin of all design.
- Designers are hopeful that technology can help re-establish a harmonic balance with nature.
- The work in the era demonstrates that art and science can combine to create beautiful and ecologically responsible design.

History of Gardens

3,000 B.C. to 1,000 B.C. - Mesopotamian gardens:

- 3,000 B.C.- Gardens of Eden & Hanging gardens of Babylon in Mesopotamia. Hanging gardens of Babylon is known as to be the seven wonders of the ancient world.
- 1,800 B.C.- The concept of "courtyard garden" began which is said to be enclosed by the walls of a palace.
- Around 1,000 B.C. – The Assyrian kings developed a style of city garden incorporating naturalistic layout, water supply & exotic plants
- High classical garden with proper geometrical layout.

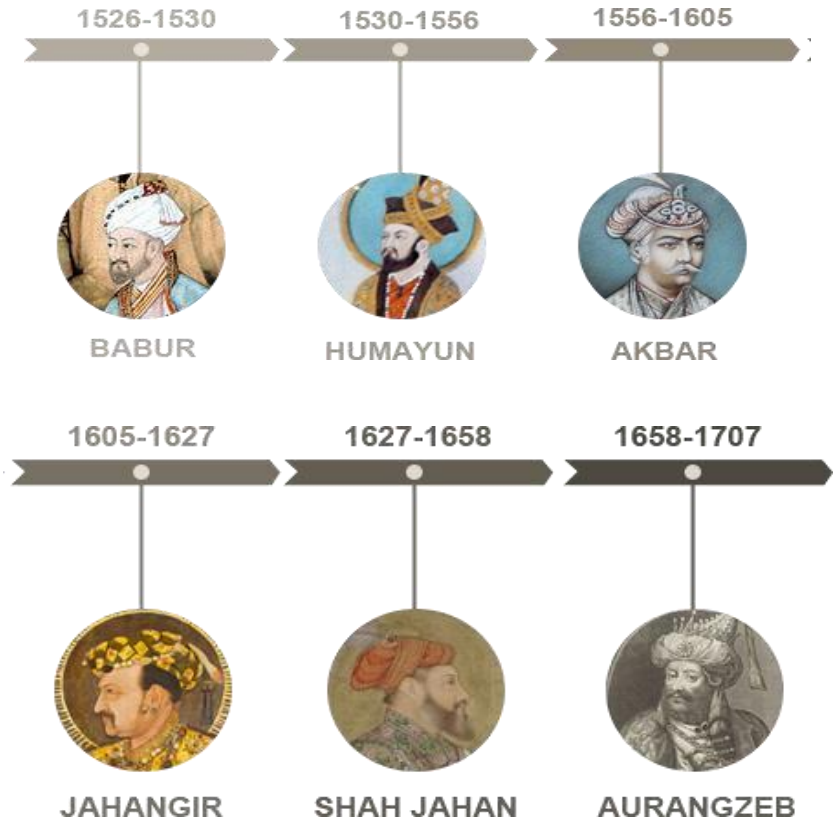
Around 4,000 BCE – Persian gardens:



The basic quadripartite structure of a Persian garden with the water feature in the center.

Elements of the Persian garden, the courtyard style in a public garden in Shiraz.

Mughal Empire



History

- Babur –the first Mughal emperor introduced ideas of Persia, art & way of life into India.
- Babur, described his favored type of garden as a Charbagh.
- This word developed a new meaning in India because, as Babur explains, India lacked the fast-flowing streams required for the Central Asian charbagh.
- The Agra garden, now known as the Ram Bagh, is thought to have been the first charbagh.
- India and Pakistan have a number of Mughal gardens which differ from their Central Asian predecessors in their highly disciplined geometry.

Types of Mughal Garden

The three types of Mughal garden based on context are as follows:

1. **Tomb Gardens** (e.g. Humayun's Tomb and the Taj Mahal)

2. **Palace Gardens** Courtyard gardens within Forts and Palaces (e.g. at Delhi and Agra)

3. **Encampment Gardens / Pleasure Gardens** (e.g. the Shalimar Bagh gardens at Srinagar, I

Shalimar Bagh, Srinagar by Haenraets, J., Schwann, A. and Atelier Anonymous

The two types of Mughal garden based on location are as follows:

1. River Side

- On the banks of river
- Commanding view of the river
- E.g. Humayun's Tomb,Tajmahal, Agra fort, Delhi fort)

2. Foot Hills

- Sited on the shallow slopes of the foot hill
- Distant view became a visual component of the designed landscape
- E.g. Gardens of dal lake- nishat bagh, shalimar bagh

3. Plains

- Landmass that generally does not change much in elevation
- E.g. Palace garden, Delhi

Concept and Influence

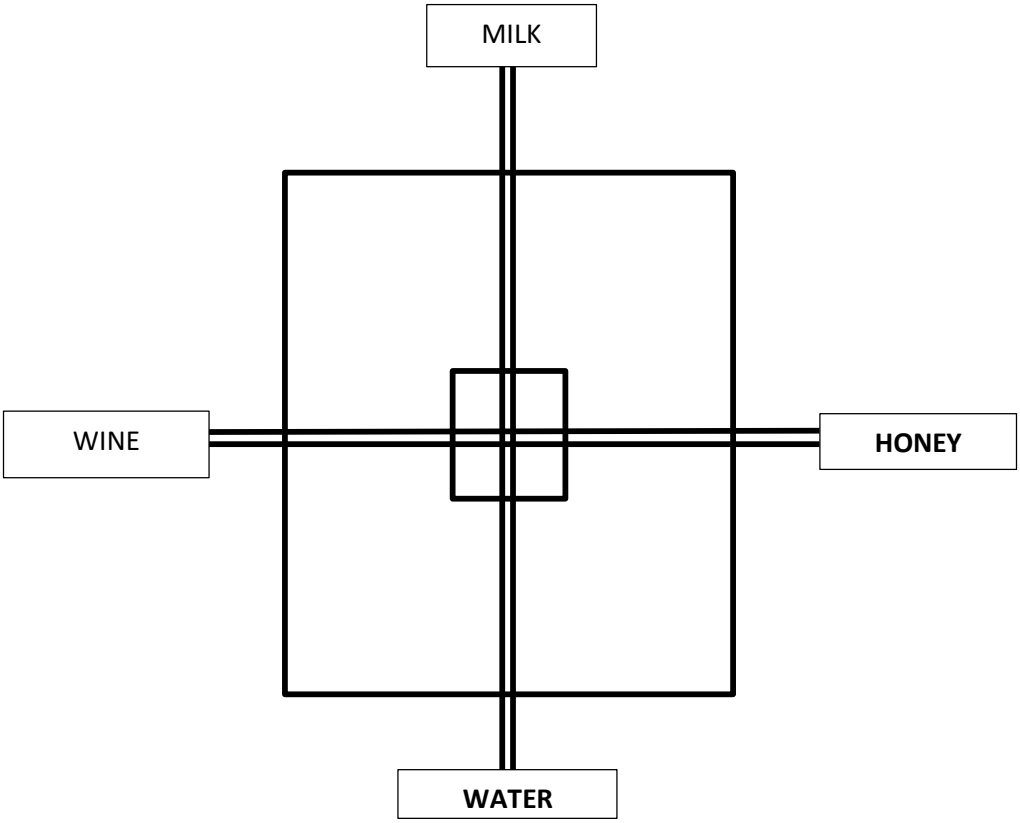
Persian Concept of Garden

- For the Mughals, gardens were like a glimpse of heaven and they drew inspiration from the Quran, modifying and adapting established designs to shape their paradise on earth.
- A Mughal garden or Charbagh was a perfectly balanced formal composition of space, vegetation and architecture, texture and color, light and shade, designed to address and delight all the senses.
- Paradise garden - 4 water channels divides the garden into 4 quarters
- Water channels-symbolize four rivers of life - Intersection of channels-symbolize meeting of god & human.

Figure 2.6 Persian concept of garden

Paradise Garden

- Consists of a cross, symbolizing the division of the world into 4 sections
- With the pool of life at its center.
- Four elements - fire, air, water, and earth.
- Four rivers in paradise



Characteristics and Elements of A Mughal Garden

Concept of Chahar Bagh

The 'Chahar Bagh' Garden Plan and Its Symbolism

- The four water channels are often associated with the four rivers of Paradise, described in the Quran, which flow to the four quarters of Heaven or from them towards the center.
- Chahar Bagh is a square or rectangular enclosure, quartered by water channels that are said to represent the four rivers flowing out of Eden (as described in Genesis).
- Examples of these include the principal Mughal tombs - Sikandar, Taj Mahal, and Humayun's tomb.

Characteristics and Elements of a Mughal Garden

Concept of Walled Enclosure

- The common square pattern of the garden or the compound of a tomb probably developed from a fusion of the walled garden, thought to have originated in the Persian paradiaza, with the concept of the Garden of Eden.
- The paradiaza is a walled enclosure that shuts out the outside world and encloses a garden.
- The fusion of these developed into the 'Chahar bagh', the quartered garden.

Figure 2.7 Nishat Bagh, Mughal Gardens

Mughal Garden Layout and Elements

Water Features

- The use of water as both an ornamental and as an essential ablutionary feature.
- Water channels are always straight and quite shallow and often tiled in turquoise or jade colors.
- There may be little bridges across water channels. Or sometimes square stone blocks are used as stepping stones.
- In large gardens, each of the ‘four gardens’ in a ‘chahar bagh’ may itself be divided into four by more ‘chahar bagh’ water channels.

Figure 2.8 Water features, Mughal Gardens

Water Features – Pools

- These are always a regular geometric shape – never like a natural pool. Most common are octagons, rectangles and eight-pointed star shapes**.** But ten and twelve sided polygons and six, ten and twelve pointed stars are also used.
- Sometimes pools include curved shapes but these are regular and symmetrical. There is one style of pool which has distinctive lotus leaf shapes along its edges. Four very small eight-sided pools are placed around a larger pool in a symmetrical arrangement.
- There are some pools where the water's surface is always rippled by fountains. There are others which are very still and mirror-like. Some pools are slowly fed by an underground water source so that they are permanently overflowing into channels which lead away from their base. This gives the pool's surface a beautiful, smooth, glassy appearance.

Water Features – Fountains

- An important thing about Islamic gardens is that they use many small fountains rather than a few big ones.
- The most common type of fountain in India, Pakistan and Iran is shaped like a short pillar and sometimes carved into a stylized lotus flower shape.
- Another common image is the rows of fountains in Mughal lakes or water channels, like this Mughal garden in Kashmir.
- The play of water fountains caused the light to sparkle and covered the surface with ripples.

Figure 2.9 Water feature - Fountains

Water Features – Chadar' waterfalls

- These are sheets of stone or white marble, set at angles between 30 and 70 degrees, whose surfaces are carved to produce ripples in water flowing over them. One common pattern is the 'pigeon-breast', where a pattern of little scallops is carved all over the marble. Another is a herringbone pattern of V shapes.

- Many chadars are quite small. But there are some large ones in Kashmiri gardens where the hilly landscape made this possible. Sometimes chadars were placed facing sunlight so that reflection would make the water bright.

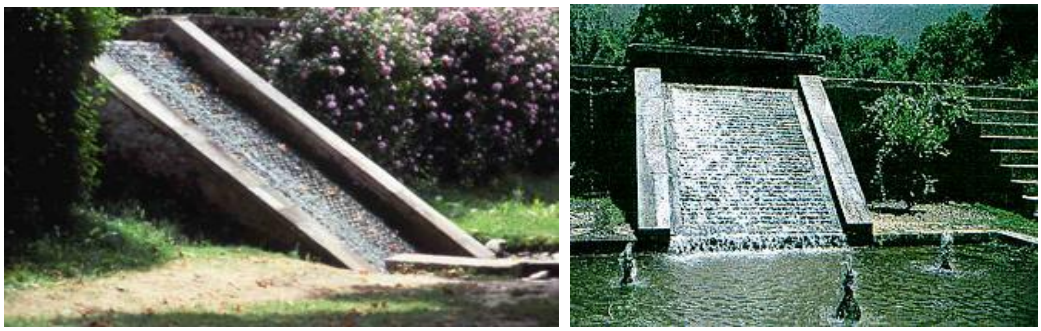


Figure 2.10 Water feature – Chadar waterfalls

Water Features – Cascades – Chini Khanas

- At night times the enjoyment: has brought down into tiny oil lamps set in marble niches sparkled from behind cascades while flickering lights were reflected from tiny boats floating across the dark water.

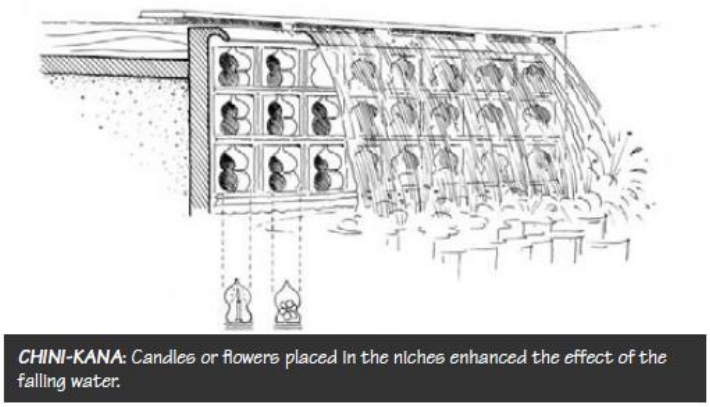


Figure 2.11 Water feature – Cascade- Chini Khanas

Water Features – Chabutras

- They are the sitting platforms placed in pools or at the junctions of water channels in India and Pakistan to provide a feeling of being surrounded by water.

Figure 2.12 Water feature – Chabutras

Paths and Avenues

- Paths run on both sides of water channels. Often they are slightly raised. There may be an avenue of tall trees along the outside of each path, shading strollers from the sun.
- Often conifers are used for tall avenues in Islamic gardens – especially the Italian Cypress tree. This is specially important tree for Islamic gardens. Plane trees are also common.
- Sometimes, in these avenues, dark cypress trees are planted alternately with fruit trees, like cherries and plum trees. The latter were sometimes seen as symbolizing life which is born and dies each year.
- Whereas the cypress, which never loses its leaves, represented eternity.
- Paths are paved in some form of attractive geometric pattern. Materials – tile, brick, cobbles or pebbles.

Figure 2.13 Paths and Avenues

Pavilions and 'Iwans'

- To help people to enjoy the garden at all times – summer and winter, day and night – Islamic gardens often include buildings, like pavilions, or shelters called 'iwans'.
- 'Iwans' are deep arched recesses in a courtyard's walls where there is a raised, sheltered platform for people to sit and be comfortable.
- Very grand iwans include little pools with fountains too.
- Some gardens have large pavilions at their center, which contain fountains and pools for coolness and are sometimes decorated with patterns in mirror work, colorful tiles and stained-glass windows

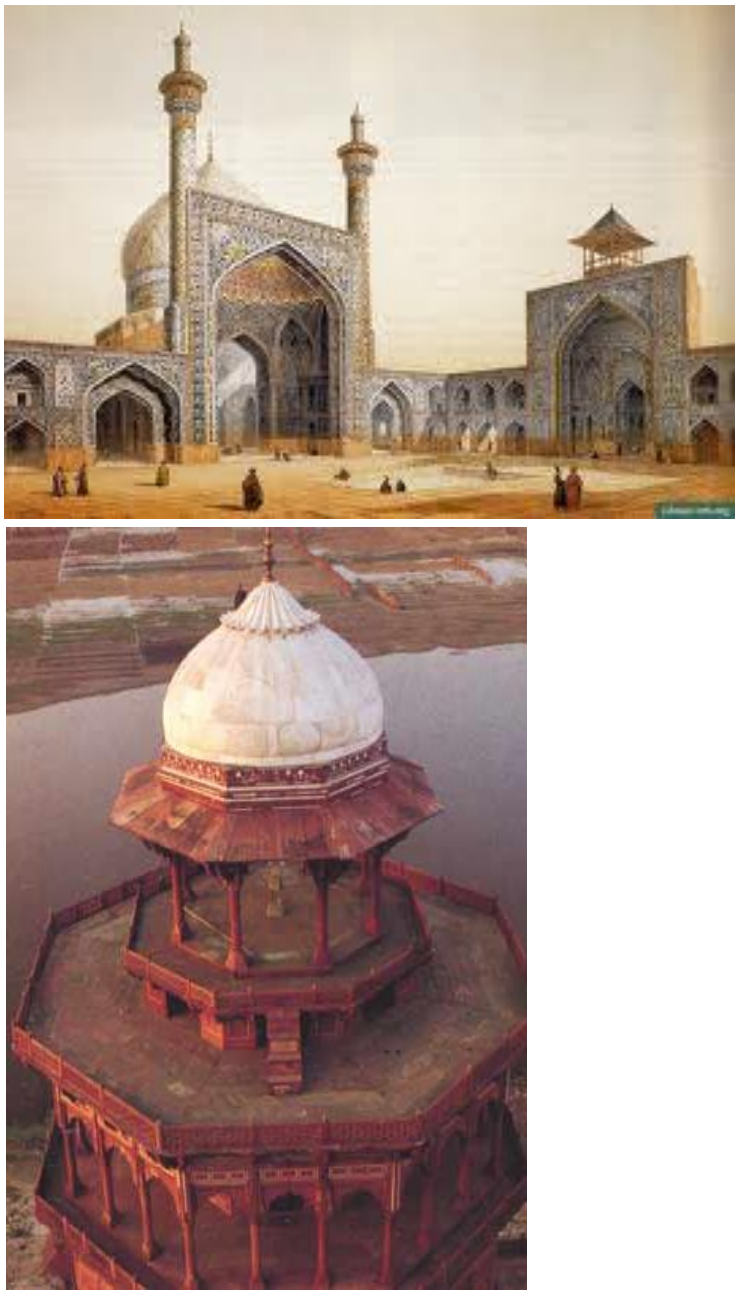


Figure 2.14 Pavilions and Iwans

Flower-Beds and Flowerpots

- Flower-beds are always a regular geometric shape – rectangles, star shapes (usually eight-pointed), diamond shapes and octagons. They are placed as part of a symmetrical pattern within the garden as a whole. Sometimes flowerbeds are the same shapes as the pools in the garden.

- Star-shaped flower beds are common. Sometimes they are very large. Sometimes there is inner star and an outer star in different colors. Sometimes there are low box bushes shaped into eight-pointed stars.

- Flowerpots are very widely used in Islamic gardens. They are sometimes massed together in large numbers. Sometimes they are lined against the side of pools.

Figure 2.15 Flower bed and flower pots

Eight' Is A Special Number

- 'Eight' is a number associated with Paradise in Islam and it is often used in the design of gardens. For instance, in the Jahan Nama Garden**,** there is an eight-sided pavilion at the center. There are eight cypresses on each side of the paths leading to it. There is a long water channel which is divided into eight sections, each containing eight fountains. Eight-sided or eight-pointed shapes are often used for pools and flower beds.

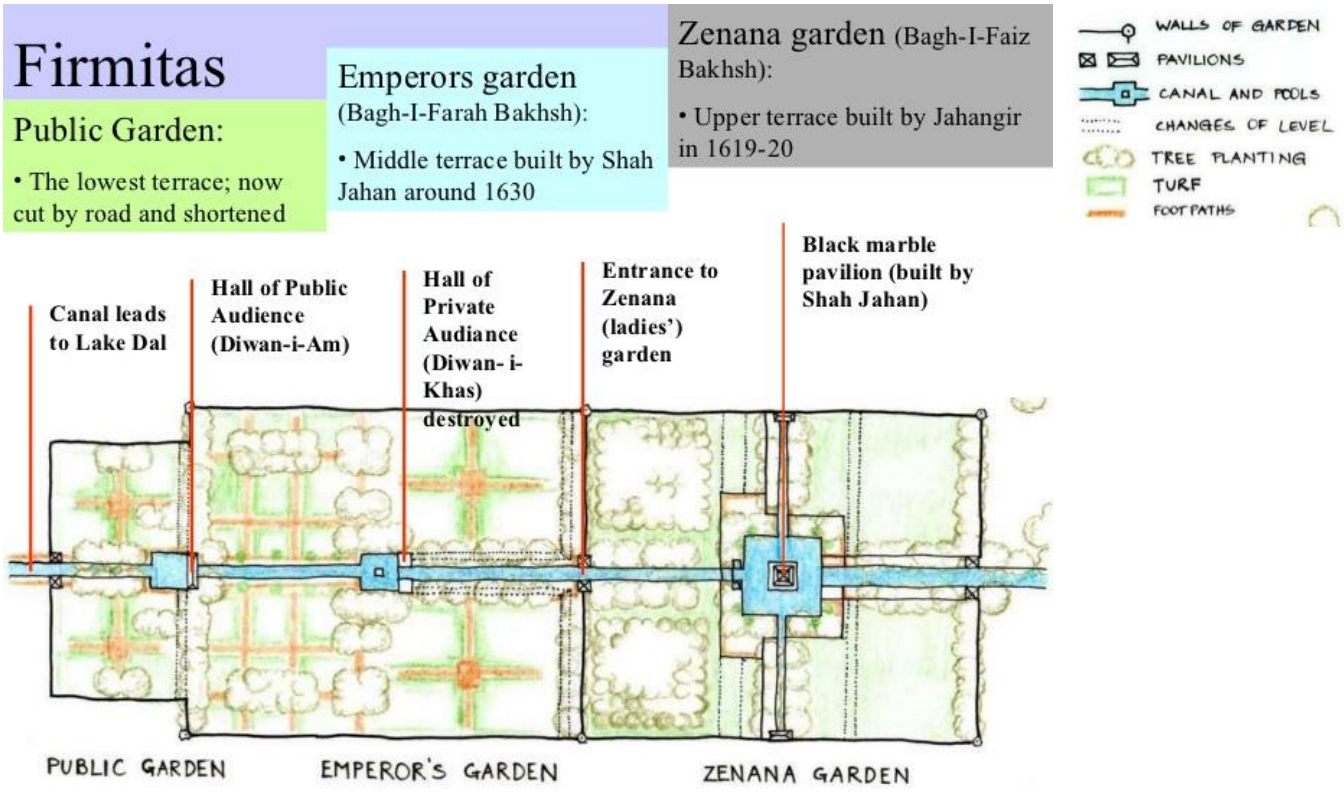
Figure 2.16 Eight shaped design

Night Time Garden Features

- Scented flowers were planted for night time – and white flowers which would look lovely on moonlit nights.
- Special night time garden feature, the 'chini-khana'. These are rows and rows of little stone niches, each holding a candle, built behind waterfalls so that the candles shine through the sheet of falling water.
- Small chini-khanas have three rows of five candle-niches each. There are some very large chini-khanas at Shalamar Gardens, Lahore, Pakistan with hundreds of niches.

SHALIMAR GARDENS – Mughal Gardens

- The Shalimar Gardens is an example of Mughal gardens built by the Mughal emperor, Jahangir, in the lake city of Srinagar, which is the summer capital of the northern most Indian state of Jammu and Kashmir.
- It was built specially for his beloved wife, Mehrunissa, titled Nur Jahan.
- The gardens comprise four terraces, containing a canal supplied with water from the Harwan gardens nearby. The top garden, unseen from below, was reserved for the ladies of the court.
- The garden is considered to be very beautiful during the Autumn and Spring seasons due to the color change in leaves and the blooming of flowers.
- The gardens were the inspiration for other gardens of the same name, notably the Shalimar Gardens in Lahore, Pakistan.



- The outer or public garden, starting with the Grand Canal leading from the lake, terminates at the first large pavilion, the Diwan-i-Am. The small black marble throne still stands over the waterfall in the center of the canal which flows through the building into the tank below. From time to time this garden was thrown open to the people so that they might see the Emperor enthroned in his Hall of Public Audience.
- The second level Emperors garden is slightly broader, consisting of two shallow terraces with the Diwan-i-Khas (the Hall of Private Audience) in the center. The buildings have been destroyed, but their carved stone bases are left, as well as a fine platform surrounded by fountains. On the northwest boundary of this enclosure are the royal bathrooms.
- At the third level Zenana garden, the little guard-rooms that flank the entrance to the ladies garden have been rebuilt in Kashmir style on older stone bases. Here the whole effect culminates with the beautiful black marble pavilion built by Shah Jahan, which still stands in the midst of its fountain spray; the green glitter of the water shining in the smooth, polished marble, the deep rich tone of which is repeated in the old cypress trees.
- This unique pavilion is surrounded on every side by a series of cascades, and at night when the lamps are lighted in the little arched recesses behind the shining waterfalls.

Central channel:

- Central axis of the garden.
- 6 meters wide - Polished stone
- Cross-axial channel on the uppermost terrace take on classical Persian chahar bagh form. Water from mountain stream dammed up.
- Square pools below pavilions recall the broadening of rivers into lakes.

Water jets and cascades:

- Gravitation Jets used to have solid plumes of water.
- Cascades of smooth sheet of water falling from retaining walls. Black pavilion is surrounded by 3 cascades.
- Now water runs only in spring (deforestation lowered water table)

Pathways:

- Slightly offset from channel on both sides.
- Stepping stones to reach Diwan-I-Am with a shaded marble throne of emperor in the center of canal above cascade
- Causeways to reach Diwan-I-Khas.
- Narrow stones bridges among fountains reach Black Pavilion .

Pavilions:

- Stone, marble, mortar.
- Used the talar and Nan (arched talar).
- Originally flat-roofed.
- Native wooden Kashmiri roofs were added in later centuries.
- Recesses (chini kanas) under cascades are filled with flowers on special occasions or oil lamps at night.

Utilities:

- Function of each section of garden changes with ascending level from
- 1) Public through 2) Courtly to 3) Private zone
- The Zenana Garden could be accessed only by Emperor and used by his court ladies

Garden Of Taj Mahal, Agra

- The Taj Mahal located at the west side of the Yamuna river , Agra, Uttar pradesh, India .
- It represents the finest and most sophisticated example of Mughal architecture.
- It consists of five major constituents, namely darwaza (main gateway), bageecha (gardens), masjid (mosque), naqqar khana (rest house) and rauza (main mausoleum).
- The architects Ustad ahmad lahauri and Mir abd-ul karim .

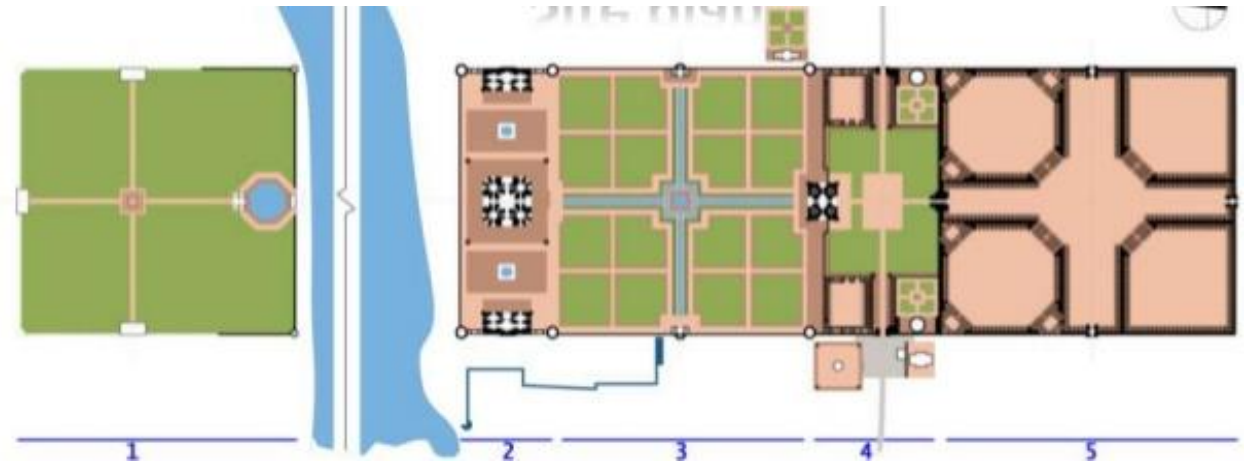
History

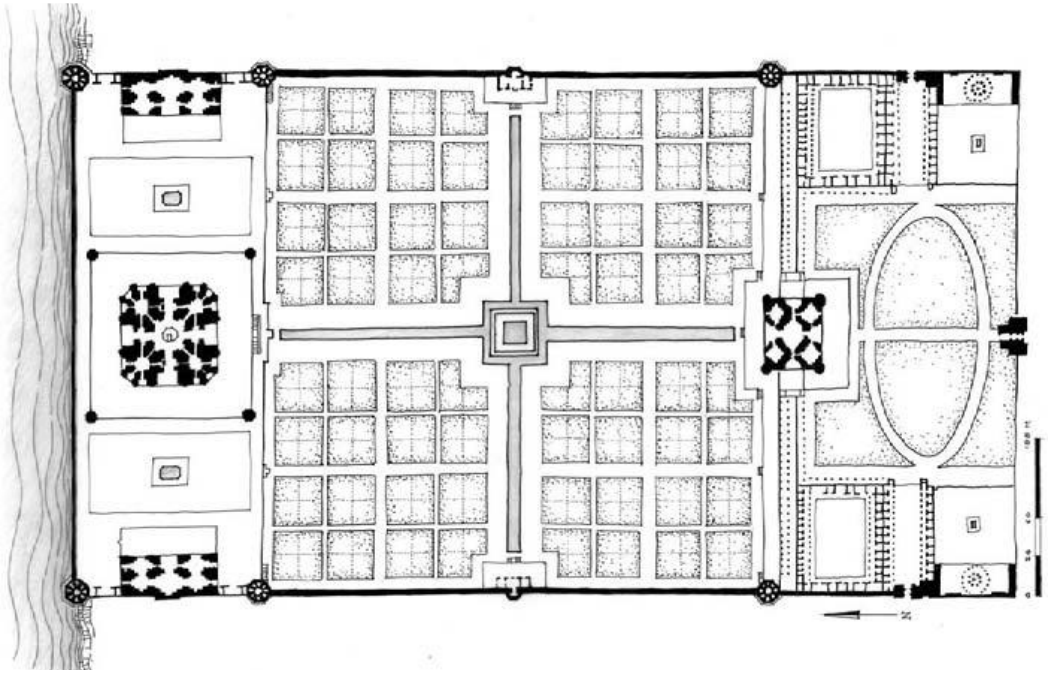
- The construction of Taj mahal started in the year 1631 was finally completed in the year 1653.
- It was soon after the completion of Taj mahal that shah jahan was deposed by his own son Aurangzeb and was put under house arrest at nearby Agra fort.
- Shah jahan, himself also, lies entombed in this mausoleum along with his wife.

Site Plan:

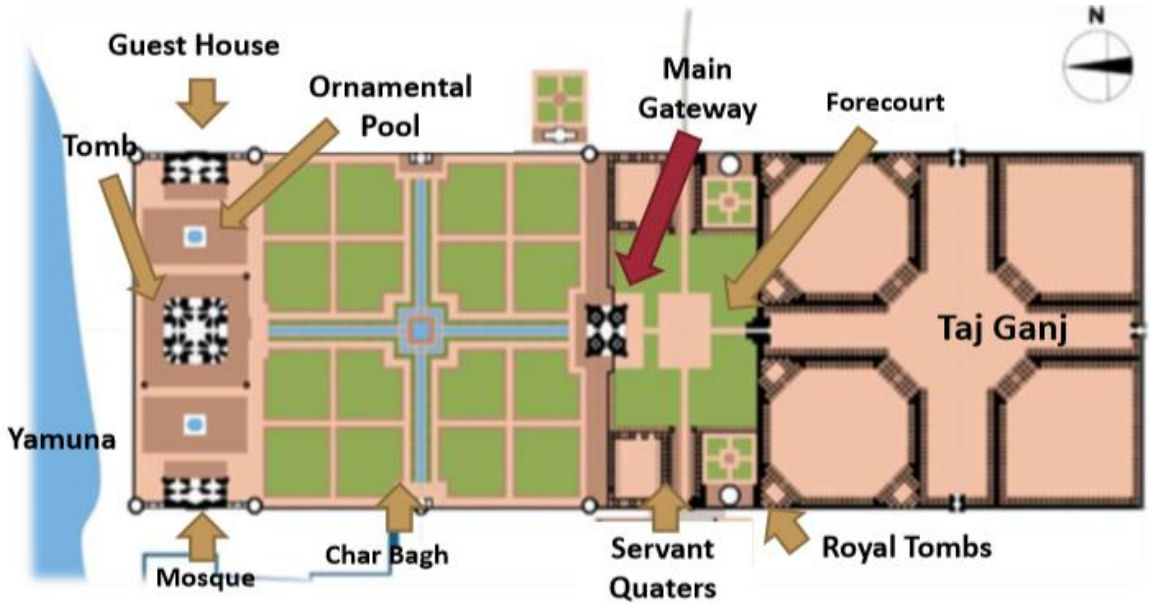
The Taj Mahal complex can be conveniently divided into 5 sections:

1. The moonlight garden to the north of the river Yamuna.
2. The riverfront terrace, containing the Mausoleum, Mosque and Jawab.
3. The Charbagh garden containing pavilions.
4. The Jilaukhana for the tomb attendants and two subsidiary tombs.
5. The Taj Ganj, originally a bazaar, only traces of which are still preserved. The great gate lies between the jilaukhana and the garden. Levels gradually descend in steps from the Taj Ganji towards the river.

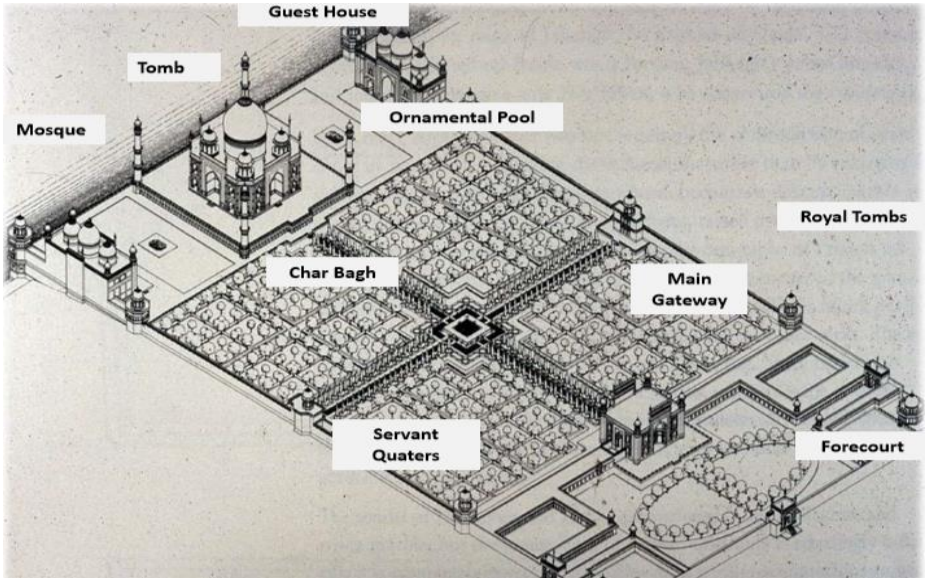




Taj Mahal: Historic plans show additional subdivisions of space within each quadrant



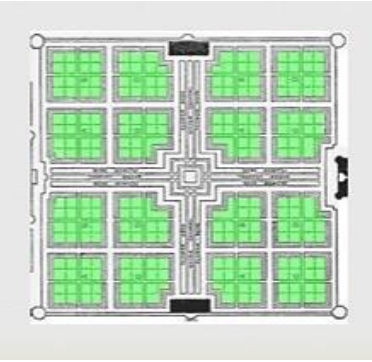
Plan of Taj Mahal, Agra



Char Bagh

- The gardens in the Mughal era were heavily influenced by the Persian style.
- The Holy Quran describes the paradise as a garden, so we see that most of Mughal monuments mostly accompany beautiful gardens as representation of heaven.
- The Taj Mahal garden are no exception and have been designed in the "Charbagh" style, that is, divided into four parts, the number four being a sacred number in Islam.

- Style: Persian
- Divided into: Four parts
- Canals: two (crossing in the center)
- Flowerbeds: Sixteen
- Trees: Cyprus & fruit bearing
- Type: formal and private
- Plan: geometric



The al-Kawthar - The Celestial Pool of Abundance

- The planner of the Taj preferred to add to the gorgeous view of the monument from the front by providing these delicate bud-shaped fountains in the Centre.
- This is the point where the two water channels intersect dividing the garden into four sections.

Garden Layout and Planting:

- The layout of the garden, and its architectural features such as its fountains, brick and marble walkways, and geometric brick-lined flowerbeds are similar to Shalimar's, and suggest that the garden may have been designed by the same engineer, Ali Mardan.
- Taj Mahal Gardens are set up in a Persian style, running from the main gateway to the base of the Taj Mahal. The Persian style of gardens, with emphasis on flowers, fruit, birds, leaves, symmetry and delicacy, was introduced in India by Babur.
- These gardens were based on geometric arrangements of nature and no attempt was made to give them a "natural" look. Another architectural attribute that has been followed in the case of the entire monument, especially the gardens of the Taj Mahal of Agra, is the usage of number four and its multiples.
- Since four is considered the holiest number in Islam, all the arrangements of Charbagh Garden of Taj Mahal are based on four or its multiples.
- The entire garden is divided into four parts, with two marble canals studded with fountains crossing in the center. In each quarter portion, there are 16 flowerbeds that have been divided by stone-paved raised pathways. It is said that even each of the flowerbed was planted with 400 plants.
- The trees of the Taj garden are either that of Cyprus (signifying death) or of the fruit bearing type (signifying life) and even they are arranged in a symmetrical pattern.

JAPANESE GARDENS

Introduction:

- The idea of these unique gardens began during the Asuka period.
- Inspired by Chinese landscape gardens.
- Japanese gardens first appeared on the island of Honshu.
- Japanese gardens have their roots in Japanese religion of Shinto.
- Earlier gardens were designed in order to bring a spiritual sense to the gardens and make them places where people could spend their time in a peaceful way and meditate.
- Today, in many parts of Japan and the western parts of the world the traditions of Japanese garden art are still maintained. The intensity of expression, continue to inspire many artists that aspire to create a personal Japanese garden of their own.
- Japanese gardens are commonly known as Zen gardens.

Elements:

- Water
- Rock and sand
- Garden bridges
- Stone lanterns and water basins
- Garden fences and gates
- Trees and flowers
- Fish

Elements - Water:

- Japanese gardens always have water, either a pond or stream, or, in the dry rock garden, represented by white sand. Water is used not just for its visual quality, but also for its sound.
- The Japanese have learnt to exploit the sound of water in all its various form. it varies from powerful waterfall to water falling into a water basin, creating different emotions.
- The bank of the pond is usually bordered by rocks & in order to preserve the natural shapes, man-made ponds are asymmetrical.

- In traditional gardens, the ponds and streams are carefully placed according to Buddhist geomancy, the art and science of putting things in the place most likely to attract good fortune.
- In Buddhist symbolism, water and stone are the ying-yang, two opposites which complement and complete each other.
- A waterfall is more suitable to stimulate both visual and acoustic senses and a lake or a pond is to create a more formal and calm setup.

Figure 2.17 Elements - Water

Elements - Rocks and Sand:

- Rock, sand and gravel are an essential feature of the Japanese garden. The rocks are like the coordinates of a garden project. Rocks and water also symbolize yin and yang, the hard rock and soft water complement each other, and water, though soft, can wear away rock.

Size:

1. Only when viewed in the context of the scale of the garden & its relationship with the neighboring rocks and other artifacts.
2. Variation in rock sizes offer greater contrast & interest resulting in the more dynamic arrangement of rocks.
3. Rocks are traditionally classified as tall vertical, low vertical, arching, reclining, or flat.

Figure 2.17 Elements – Rock and Sand

Colours:

1. Generally bright colors are avoided.
2. Color of rocks generally varies from grey to black, and from yellow to brick red on other hand.

Texture:

1. Rocks are often used to represent islands and mountains, so conical or dome shaped rough volcanic rocks would be the obvious choice. (kansai) Hard metamorphic rocks are usually placed by waterfalls or streams.
2. A jagged textured rock gives feeling of timelessness and dignity. Smooth rocks like water worn stones or glacial boulders convey the feeling of antiquity especially when combined in an interesting shape are used around lakes or as stepping stones.

Certain guidelines or ground rules are followed to achieve good results such as:

1. Rocks of varying sizes are used to emphasize the contrast.
2. Asymmetric arrangement of rocks is preferred over symmetrical arrangement.
3. Sometimes there is a tradition for arranging the rocks to reflect the philosophical concept heaven, earth and man.

Elements – Garde Bridges:

Bridges could be made of stone or of wood, or made of logs with earth on top, covered with moss; they could be either arched (soribashi) or flat (hirabashi).

Figure 2.18 Elements – Garde bridge

Elements – Stone lanterns & water basins:

- Stone lanterns,in its complete and original form, like the pagoda, represent the five elements of Buddhist cosmology. The piece touching the ground represents chi, the earth; the next section represents sui, or water; ka or fire, is represented by the section encasing the lantern's light or flame, while fu (air) and ku (void or spirit) are represented by the last two sections, top-most and pointing towards the sky.

- Stone water basins, (tsukubai) were originally placed in gardens for visitors to wash their hands and mouth before the tea ceremony. The water is provided to the basin by a bamboo pipe and they usually have a wooden ladle for drinking the water.

- In tea gardens, the basin was placed low to the ground, so the drinker had to bend over to get his water.

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Figure 2.18 Elements – Stone lanterns

Elements – Garden Fences and Gates:

There are three types of fences:

1. The short fence which extends from the house into the garden.
2. An inner fence.
3. An outer fence.

- Short fences or sodegaki are screens that hide unwanted views or objects.
- They are about 6 or 7 feet high and add color and texture to the garden.
- Materials used are bamboo, wood and twigs of bamboo or tree.

Elements – Trees and Flowers:

- Plants are chosen according to aesthetic principles.
- Plants are used either to hide undesirable sights or to serve as a backdrop to certain garden features, or to create a picturesque scene, like a landscape painting or postcard.
- Trees are carefully chosen and arranged for their autumn colors.
- Mosses often used to suggest that the garden is ancient.
- Flowers are also carefully chosen by their season of flowering.
- Some plants are chosen for their religious symbolism, such as the lotus, sacred in Buddhist teachings, or the pine, which represents longevity.
- The trees are carefully trimmed to provide attractive scenes, and to prevent them from blocking other views of the garden.

Elements – Fish:

- The idea of using fish in landscape.
- Garden is borrowed from Chinese garden.
- Japan is a country where a large population leaves little land available for flower gardens.
- The Japanese, therefore, have found places to grow living flowers, the colored carps.

- They appeared in Japan many centuries ago and the Japanese have crossbred them for over 100 years, producing carps of high value that bring a flash of color to the shallow waters.
- Carps can live for up to 50 years. In Japanese culture, they are a symbol of strength and perseverance.


Figure 2.19 Elements – Fish

Elements – Kasan and Bonsai:

Kasan

- These are miniatures of mountains in Japan.
- They are made up of ceramics, dried wood or strangely-shaped stones.
- They generally have sharp peaks.

Bonsai

- Bonsai is a Japanese art form using miniature trees grown in containers.
- The trees are usually less than one-meter-high and kept small by pruning, re-potting, growth pinching, and wiring the branches.
- Pine, cypress, holly, cedar, cherry, maple.


Figure 2.20 Elements – Kasan and Bonsai

Principles:

- **Natural**: That should make the garden look as if it grew by itself.
- **Asymmetry**: That creates the impression of it being natural.
- **Odd numbers**: Like three, five or seven; that support the effect of the asymmetry.
- **Simplicity**: That follows the idea of 'less is more'.
- **Triangle**: That is the most common shape for compositions made of stones, plants, etc.
- **Contrast:** That creates tension between elements.
- **Lines**: That can create both tranquility and tension.
- **Curves**: That softens the effect.
- **Openness**: That indicates interaction between all elements.

Types of Japanese Gardens:

1. Karesansui Gardens or dry gardens
2. Tsukiyama Gardens or hill garden
3. Chaniwa Gardens or tea gardens

Karesansui Gardens Or Dry Gardens

- Also known as rock gardens and waterless stream gardens.
- Influenced by Zen Buddhism and can be found at Zen temples of meditation.
- Found in the front or rear gardens at the residences.
- No water presents in gardens. Raked gravel or sand that simulates the feeling of water.
- The rocks/gravel used are chosen for their artistic shapes, and mosses as well as small shrubs.
- Plants are much less important (and sometimes nonexistent)

Figure 2.21 Dry Gardens

- Rocks and moss are used to represent ponds, islands, boats, seas, rivers, and mountains in an abstract way.
- Gardens were meant to be viewed from a single, seated perspective.
- Rocks in karesansui are often associated with Chinese mountains such as Mt. Penglai or Mt. Lu. Karesansui.
- Stones are usually off-white or grey though the occasional red or black stone were added later.

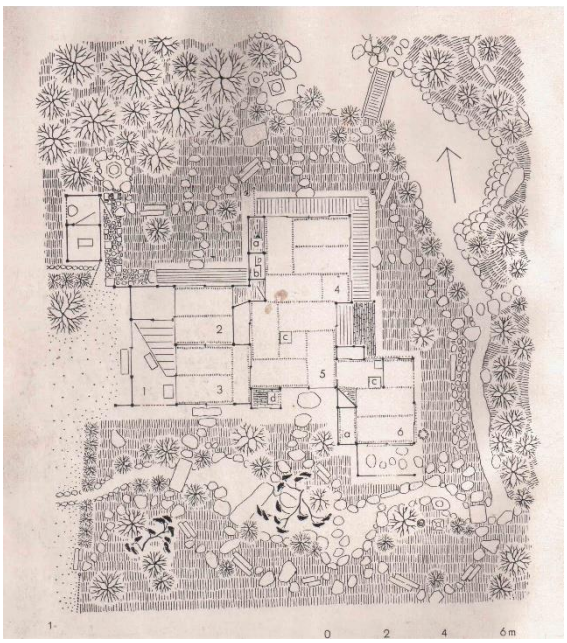
Tsukiyama / Hill gardens

- They strive to make a smaller garden appear more spacious.
- Shrubs are utilized to block views of surrounding buildings.
- The gardens main focus is on nearby mountains in the distance.
- The garden has the mountains as part of its grounds.
- Ponds, streams, hills, stones, trees, flowers, bridges, and paths are also used frequently in this style as opposed to a flat garden.

Chaniwa Gardens Or Tea Gardens

- Developed for the tea ceremony called 'cha no yu'.
- Not a well composed garden as earlier examples, the objective was to bring about a separation from the outer world and to facilitate entry into another realm.
- Main focus is the tea garden path or 'Roji' meaning dewy path.
- Elements were bamboo fence around the garden, a natural stone basin to wash hands, and stone lanterns to light the path and basin.
- Were precursors of the Stroll garden

Saihonji Gardens

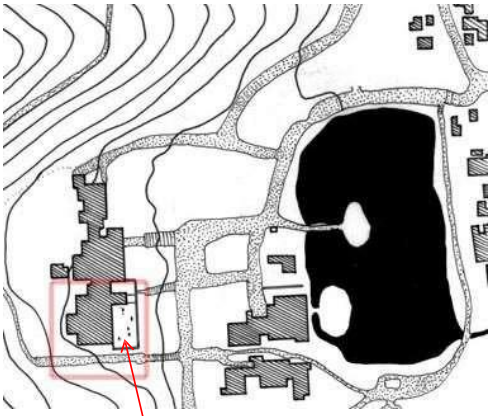


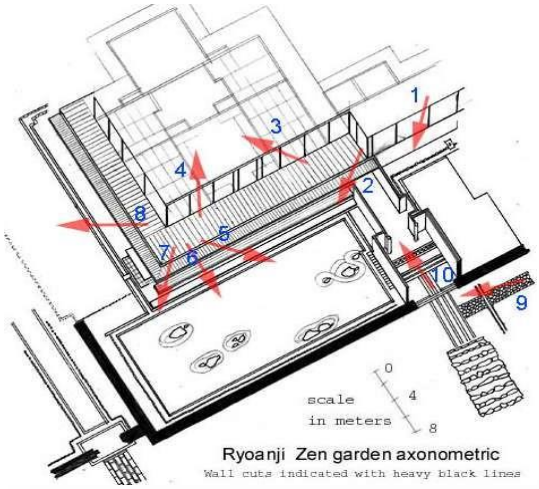
Saihonji Gardens

- The famous moss garden of Saiho-ji is situated in the eastern temple grounds. Located in a grove, the garden is arranged as a circular promenade centered on Golden Pond.
- The pond is shaped like the Chinese character for "heart" or "mind" and contains three small islands: Asahi Island, Yuhi Island , and Kiri Island. The area around the pond is said to be covered with more than 120 varieties of moss, believed to have started growing after the flooding of the temple grounds in the Edo Period.
- The garden itself contains three tea houses, which were partially inspired by phrases from the Zen work.
- The eastern temple grounds also contain the main temple hall, the study, and a three-storied pagoda.
- The northern temple grounds contain a Zen rock garden, and a temple hall known as Shito-an.
- It is famous for its moss garden, for which reason it is also commonly known as Moss temple or Koke-dera.
- Today, there are roughly 120 types of moss in the garden. It is a stroll garden, set in a dark forest and designed for meditation.

Ryoanji Gardens

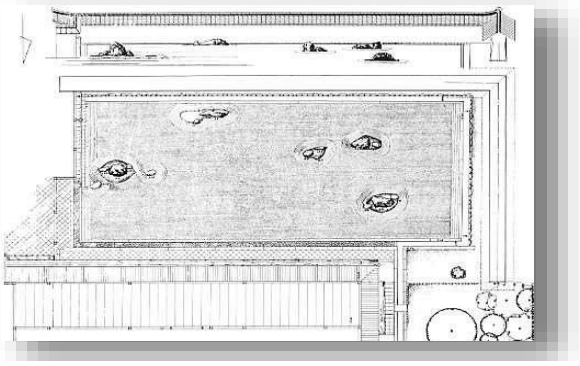
- Ryoanji (Peaceful Dragon Temple) is a Zen temple and World Heritage Site in northwest Kyoto, Japan.
- Best known for its Zen garden, simple gravel-and-rock arrangement that inspires peace and contemplation.
- It is considered one of the finest surviving examples of kare-sansui (dry landscape).
- The garden measures thirty by seventy-eight feet. To the east, a low wall surrounds the garden. On its north side the long veranda where the visitors experience the garden is located. On the southern and western side, a wall-topped with thatched roof tile edges the garden.
- The Zen garden itself is comprised of fifteen stones, arranged in five groups, placed on of raked sand.





Ryoanji Zen garden axonometric

Wall cuts indicated with heavy black lines



- Consists of fifteen moss fringed stones placed in a bed of white quartz gravel evenly scored with the long continuous marks of a rake.
- There are from left to right, five, then two, next three, again two, and finally three stones.
- Sitting at any point in the veranda, the viewer will always find one stone is hidden from view. The compositional balance of this garden can be grasped intuitively, not analyzed logically

Figure 2.22 Dry Gardens

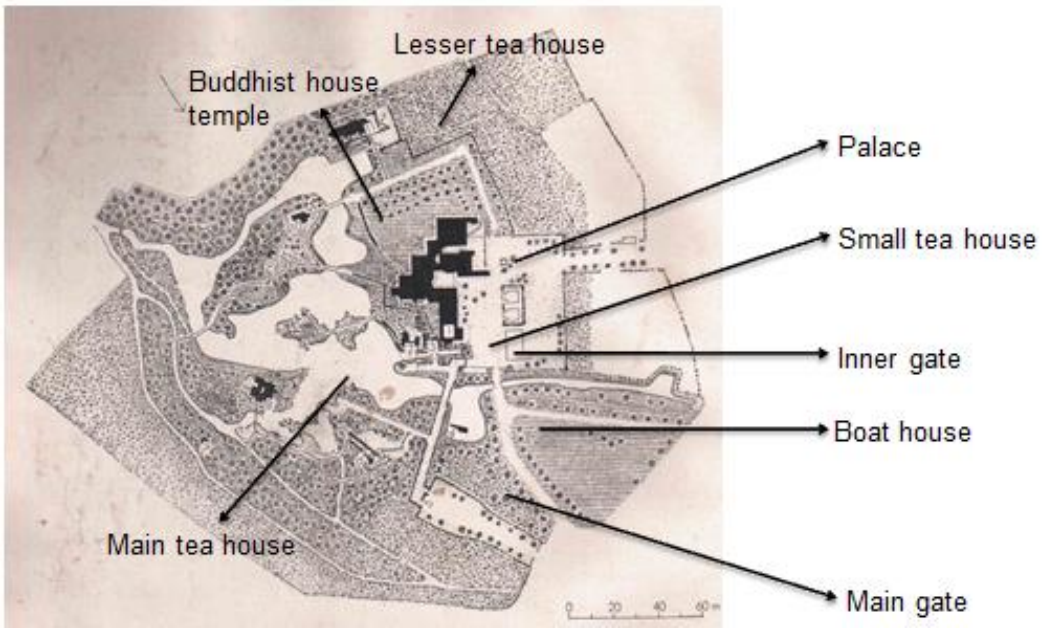
The path

- The most notable aspect of the tea garden is the ground plane itself.
- The path consists flat stepping stones set within moss. Usually rounded river washed stones were preferred

Figure 2.23 Paths

Katsura Imperial Palace Garden, Kyoto

- Lake of 1.25 hectares was dug, hills and islands were formed, beaches made, pavilions built and planting undertaken.
- Has 16 bridges connecting the lake.
- Lake used for boating parties and the surrounding land as a stroll garden, in effect a tea garden on an enormous scale.
- The 'Katsura Tree' was associated with the God of the Moon and the garden has a platform to view its rising.
- There are 23 stone lanterns to light the stroll path after dark.
- Stone basins were used for hand-washing before a tea ceremony.
- Garden designed not only for meditation (Zen) but also for ceremonious courtly pleasures.



- A garden to be viewed by walking through it. Developed from the tea garden.
- Consists of paths in Zig-zag movement, creating scenic surprises as one travels along.
- The technique of hide and reveal is the essence of a stroll garden.
- With the stroll garden, the stepping stone path of the tea garden, is employed for the purpose of kinetic experience of Landscape

.Italian Renaissance Gardens

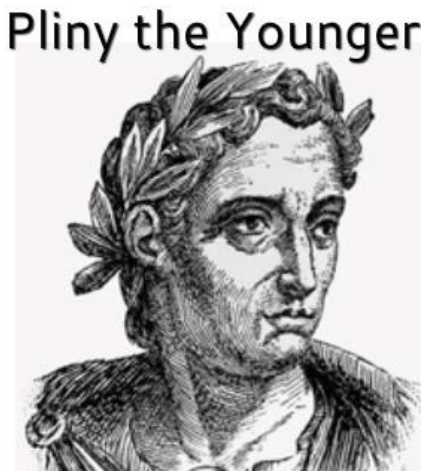
Italian Renaissance gardens - Location and Time period

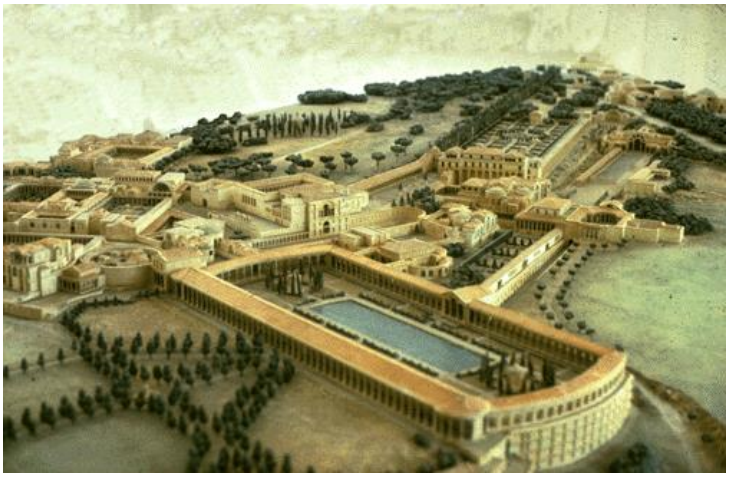


Concentrated mainly in the farms of the hillsides of Florence, Tivoli, Bagnaia and other northern towns of Italy. Historical period- 14th -16th Cent. Initially Renaissance, followed by Baroque and declined after that.

Background

- Evolved from the Cloister gardens of the middle ages, but were inspired and followed the great roman gardens. Also inspired by writings of Pliny the younger, which contained descriptions of his villas in Pompeii and Laurentium.





15TH Century

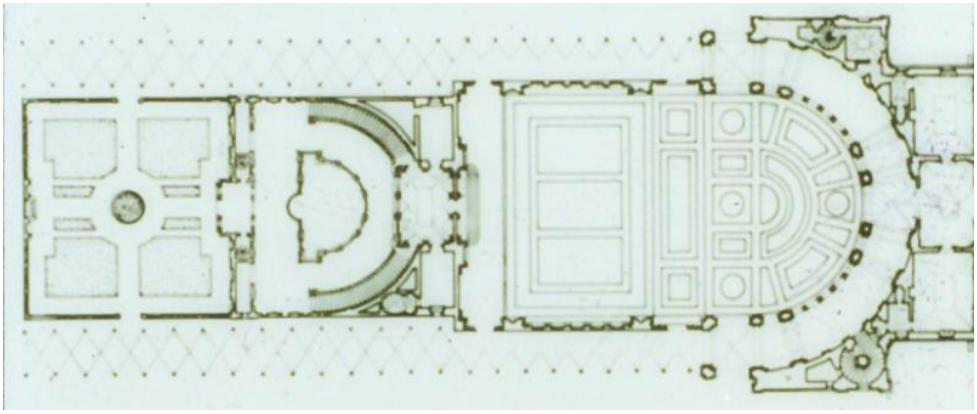
- Medieval thinking to expansiveness.
- Humanists believed that the divine could be perceived in the order of nature. Gardens could be composed to express the order.
- Landscape appreciated for their scenic value.
- Gardens focused outward.

Types

- Predominant form of the garden type was the country villa purely designed for pleasure.
- A farm center for the 'padrone' to live in when stock taking – the garden here is still subsidiary to the farm.
- Semi town garden – Having a simple vista directly from street, through the courtyard and out into the small formal garden beyond.

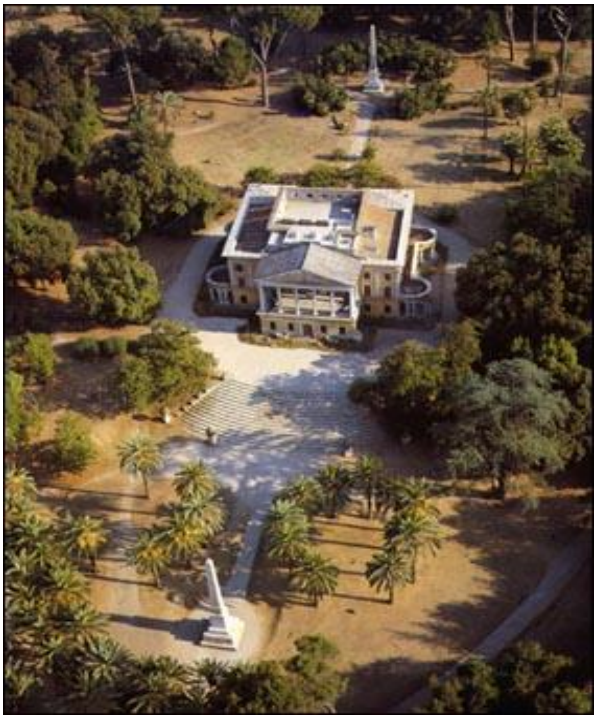
Composition of the garden

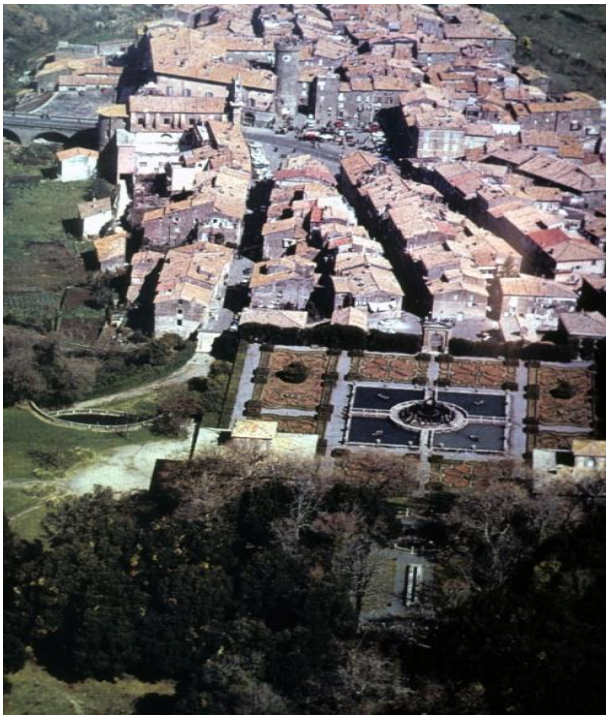
- Formed a suite of garden reception rooms, spreading from a central court to theatre and loggias and beyond to terrace on terrace of gardens.
- The Actual living rooms were negligible.



Siting and Surroundings

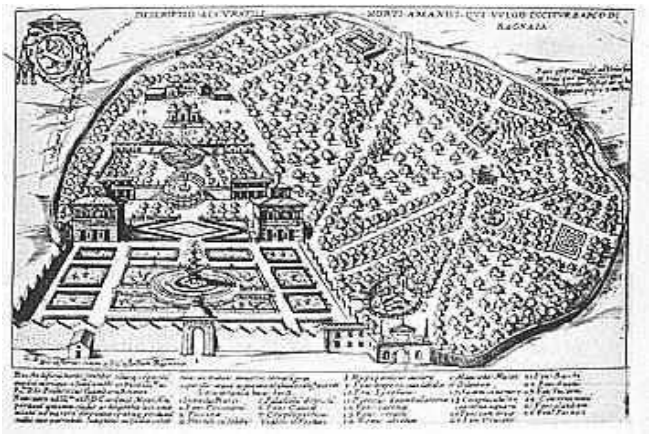
- The Villas and gardens maintained a strong connection with the surrounding countryside.
- The garden design was sympathetic to the country in which they were designed.
- The garden was considered a part of the house and vice versa.
- The garden was the mutual ground in which the house and the surrounding nature met.
- The scale of both the house/villa and the garden varied from intimate to very large.
- The nature of countryside varied from flat uninspiring plains to steep hillsides.





Design principles

- The lines of the garden should grow less defined as they left the house, like water ripples spreading from the center to die gradually into their surroundings – lines always formal(defined) and less and less emphasized.
- The garden should merge not into, but from its surroundings – The excited stream of Garden pours from the woods, down the Hillside, and floods into the calm formality in the square water garden below.



Character of the Garden

- Varied with the patron. Some had the character of a dignified room. Ex- Villa Piccolomini at Frascati.
- Or could be dramatic with all surprises and allusions. Ex- Villa Gamberia
- axial arrangement
- Abundant presence of water
- use of decorative sculpture
- Ground plane of garden into compartments (parterres)
- Very formal lines that intersect - Result of hot climate
- Influences French baroque gardens
- Geometrically patterned beds, or parterres, are a distinct element of the Italian style.
- Traditionally, Italian gardens had few flowers. The plants were primarily evergreens for texture and shape, often in manicured topiary.
- Designed to be inspiring all year round

- Not dependent on color
- Very formal
- An expansive vista - Display and backdrop for sculpture
- Historic themes
- Contrast of sun and shade - Shady alley or walk
- Water Features

Response to Surroundings

- When the view was uninteresting – the garden was shut by walls and lively scene was introduced within by frescoes – Villa Corsi-Salviati at sesto.
- When the view was very good, the garden itself was reduced in proportion to the nature outside – Villa Mondragone at Frascati, only a terrace separates the house from the unrestrained splendor of the view.

Climatic Response

- Strong sunlight and relatively hot summers.
- Led to avoidance of flowers and lawns.
- More of shade, a sense of coolness – led to use of evergreens, stonework and water.

Color in garden

- So glaring is the light in Italy, that the bright colors of flowers are not greatly missed.
- Soft cool tones mostly grey and greens are more prevalent in response to this glare.
- However sometimes relief was brought by the coloring of the house itself in bright colors.

Planting and Shade

- Hardwoods and evergreen trees dominated, especially in Bosco's.
- Boscos –wooded areas which surrounded the garden enclosure and acted as buffers. Also symbolized the sacred woods and gardens of earlier Rome.
- Cypresses were used for avenues
- Ilex, beech hedges were also used for their shade value.

Elements Of Gardens – Avenues And Vistas

- Generally originated from or culminated in the house, but can also lead to a primary feature or climax- which could be a fountain or grotto. Accentuated by planting, these avenues carry the eye over practically unlimited distance of otherwise natural land.
- The dramatic qualities of a View were consciously accentuated For ex. In the vista from the house at valanzibio, the effect of distance is obtained by a gradual closing in of the elements. At other instances, perspectives were falsified for dramatic effects. The cunning widening of the cascade towards the top gives the effect of added distance from above and from below exaggerates the steepness and violence by bringing the top very much nearer.

Elements of Gardens – Gardino segreto

- The secret garden is found in every garden, where there is the slightest hint of entertaining.
- Not so much for secrecy, as for seclusion and unexpectedness/ surprise – also meant a smaller relative scale.

- Meant more for the use of patron themselves, a place to unwind.

Elements of Gardens – Sculpture

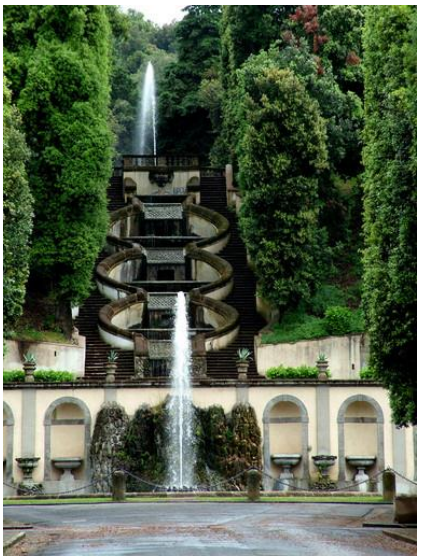
- Italian Gardens were incomplete without sculpture. In fact the notion that a garden was a setting in which white marble figures should be seen against dark green foliage or framed by architectural niches within building facades and garden walls was fixed firmly in the mind of all padrons.

- The theme was mythological, certain heroes and themes were chosen to symbolize the patron and his benevolence.

Elements of Gardens – Steps and Staircase

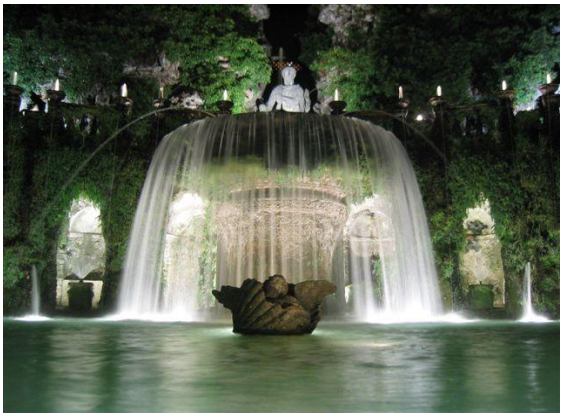
The ascent was gloriously celebrated in Italian gardens.

- There were often multiple sets of steps. The most common was the double diagonal steps.
- Some of these had water and became water steps
- Some had at times a concealed element like a torrent of water, unexpectedly drenching the viewer.


Elements of Gardens – Water

- Water was everywhere in the Italian gardens.
- In Villa d'este, Tivoli the entire garden is a complete water garden spectacle.
- Present as fountains (made possible by 'fountanieri' -hydraulic engineers with reputation akin to magicians because of the ingenuity of their creations), Reflecting pools, Basins and small ponds.

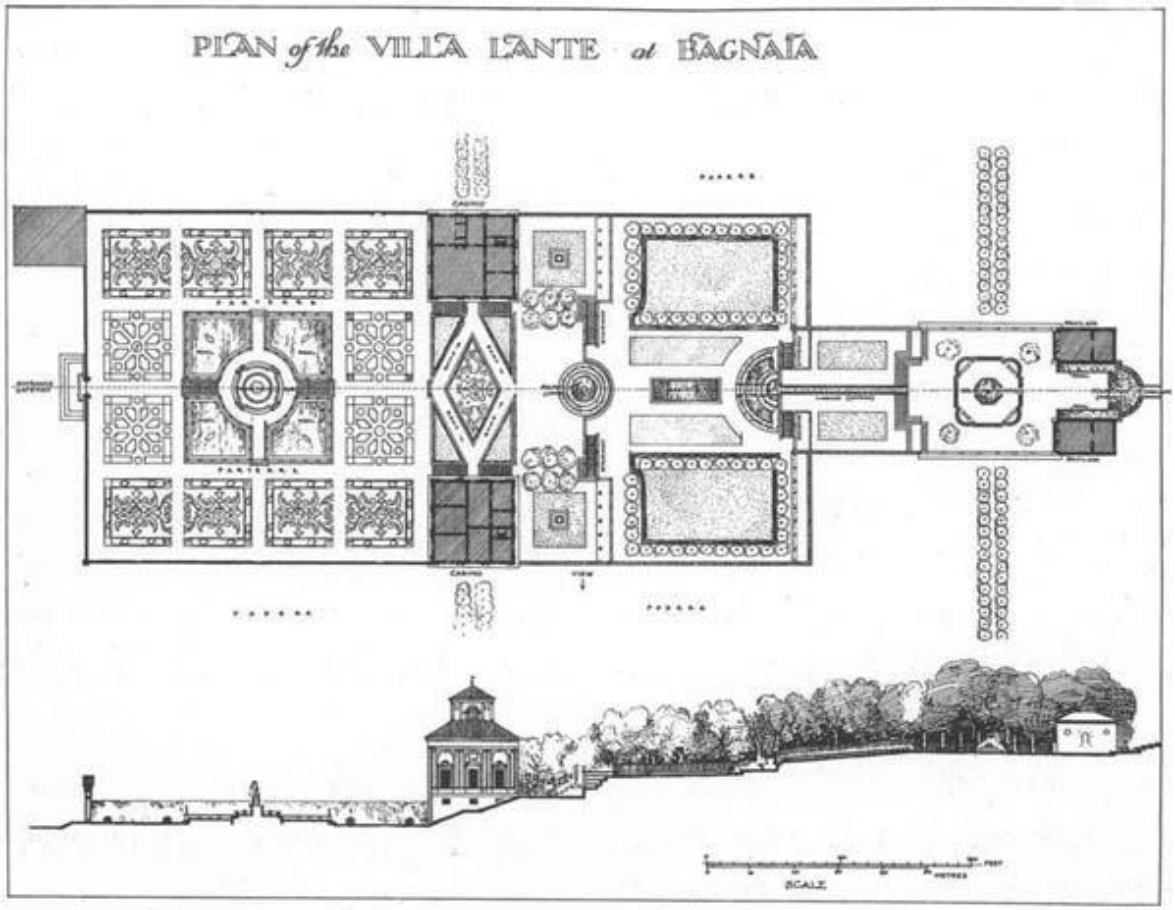



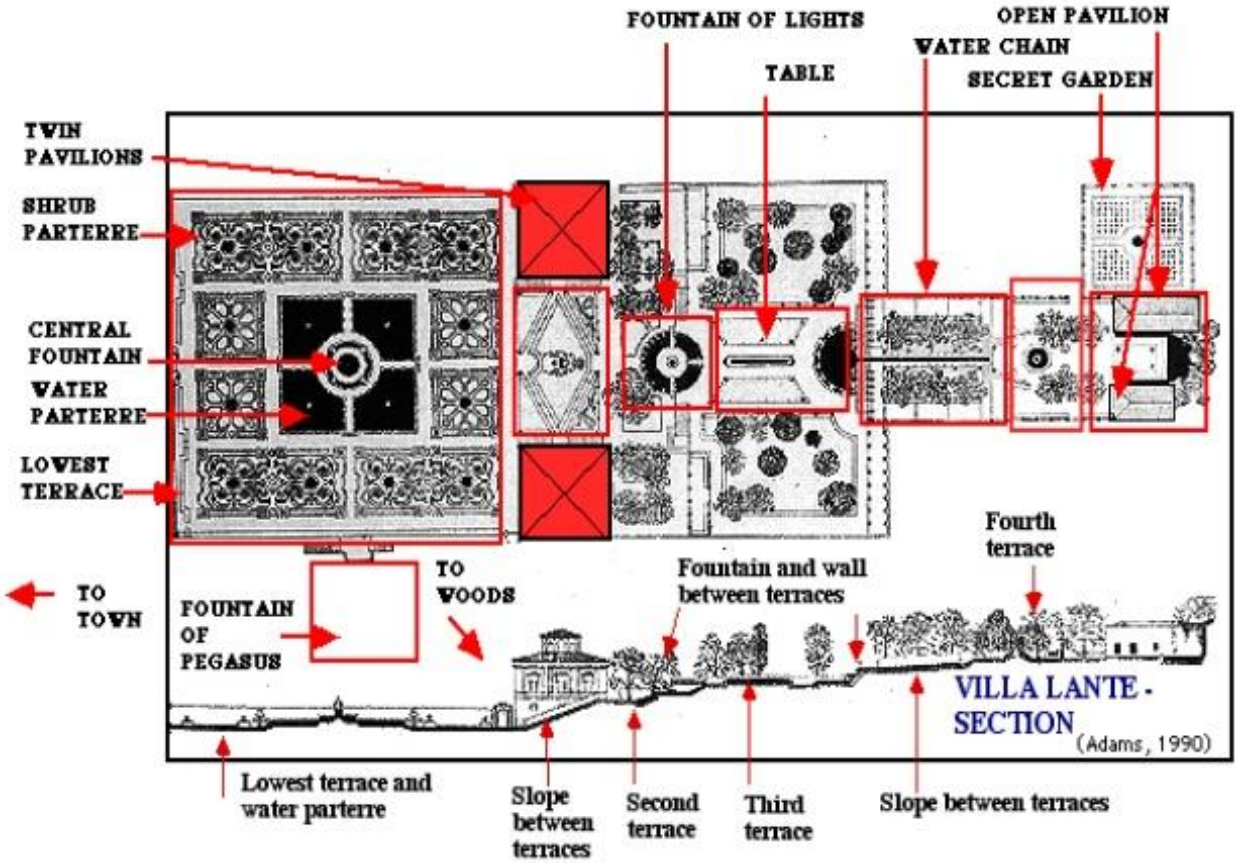
Elements Of Gardens – Parterre

- A pattern woven on ground with low level shrubs primarily green in colour.
- Meant to be viewed from above.
- Were sometimes very intricate and formal.

VILLA LANTA, BAGNAIA

The compact garden at Villa Lante presents a unified composition of "part" to "whole"





- Begun in 1568 by Cardinal Gianfrancesco Gambara, the Villa Lante (named for a later owner) is a superb expression of Renaissance design principles. The garden, an axial composition juxtaposed against an untamed woodland, is schematically similar to the barchetto at Villa Farnese (described next), but differs experientially.

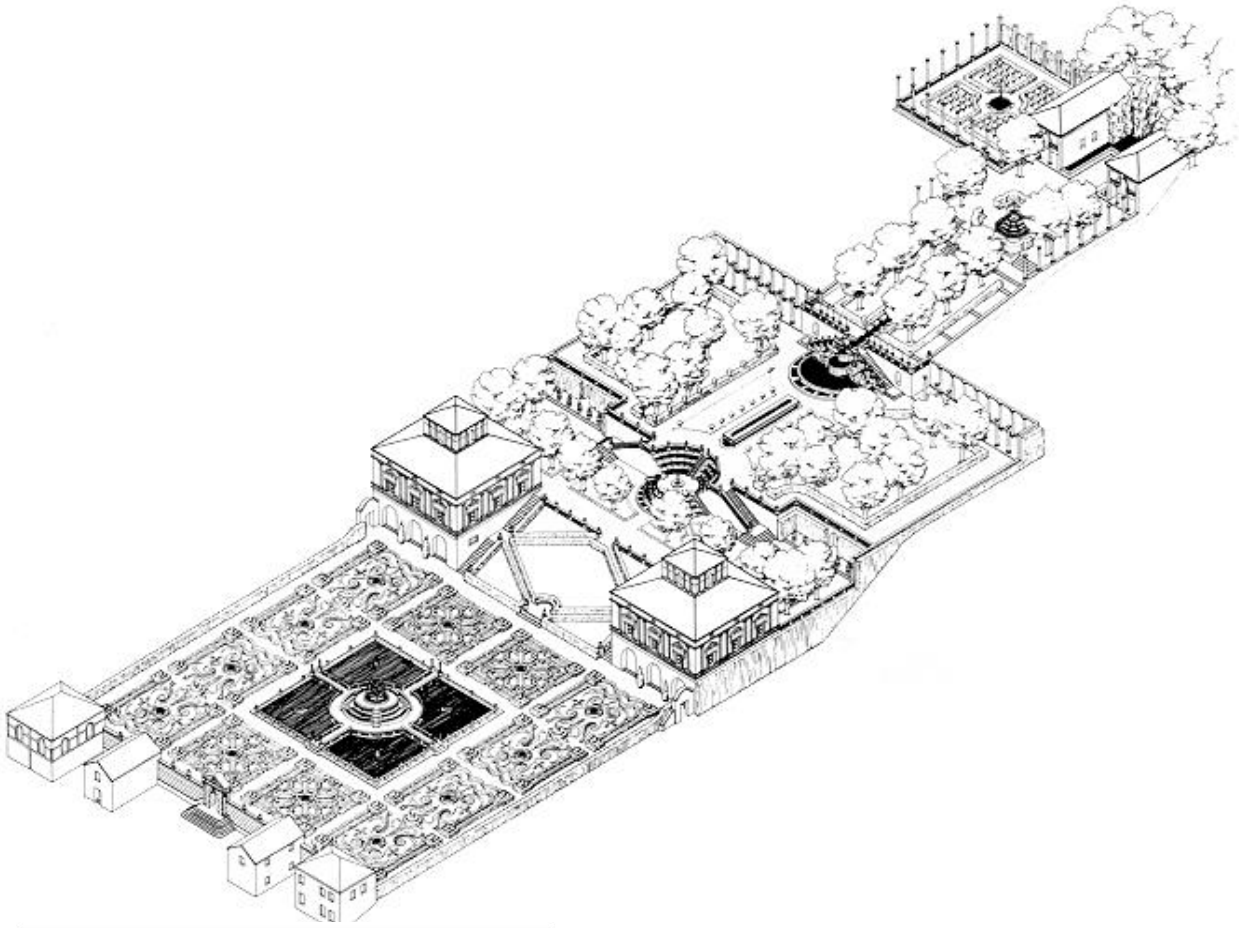
- Since antiquity, the town of Bagnaia was celebrated for its springs and baths. The cardinal repaired the aqueducts, bringing fresh water to the town in hopes of restoring its ancient status. Tommaso Ghinucci, who is cited as the designer of the waterworks at Villa Lante, revised the urban plan of Bagnaia, creating three new avenues that converged near the lower gates of the villa.He also added a loggia to the bishop's townhouse located near this small junction.

- Organized around a central axis of water, the compact garden at Villa Lante presents a unified composition of "part" to "whole." The architectural massing stepped slope, to the Fountain of the River Gods (the Tiber and the Arno).

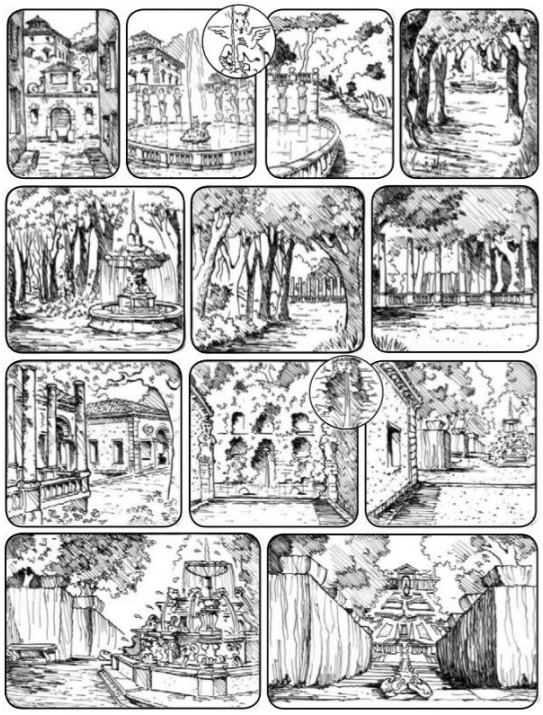
- A water table, as referenced in antiquity, occupies the axis on the second level.

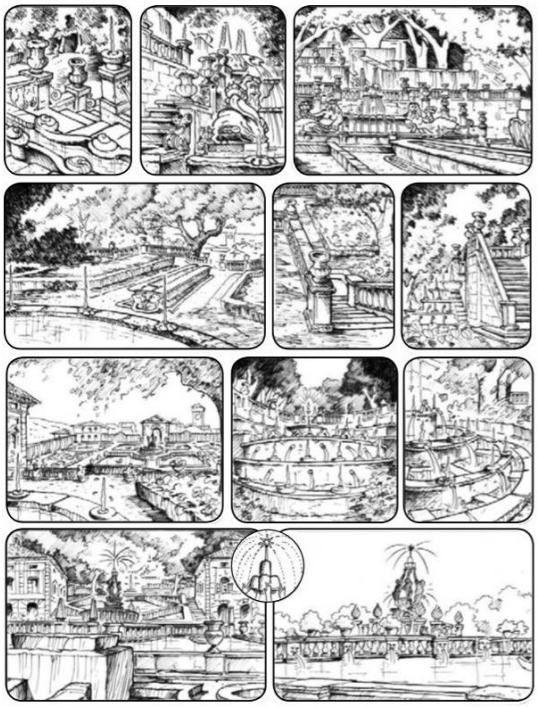
- The concave and convex Fountain of the Lights serves as the transition to the lower terrace. Grottoes of Venus and Neptune are recessed into its retaining wall.

- Steps and ramps lead to the four-square water parterre on the lowest level.
- A central sculpture representing the Montalto family emblem terminates the axis. The garden remains a stunning example of Renaissance design to this day.
- Two casinos flank the central axis, creating a continuous experience of landscape space. Paths and stairs move the visitor to and from the axis in a subtle choreography of dark to light, open space to enclosed, internal focus to outward view.
- An allegory of the control of nature was told through the course of water as it fl owed from the upper parts of the garden to the lower parts. Humans mastered nature through art. The narrative began in the barco (park), but no predetermined route was prescribed. A fountain of Pegasus marked the entry to the woodland, an allusion to the creation of the home of the
- Muses on Mount Parnassus. Situated within clearings were myth logically themed sculptures
- Two casinos flank the central axis, creating a continuous experience of landscape space.
- Paths and stairs move the visitor to and from the axis in a subtle choreography, open space to enclosed, internal focus to outward view.
- A path from the barco leads to the upper level of the garden. The water course begins in a grotto, the Fountain of the Deluge, situated between the two Houses of the Muses. The Fountain of the Dolphins marks the uppermost level of the axis
- Its hillside location on the edge of the town of Bagnaia opened up the possibility of using water in a very expressive way. The garden consisted of several shallow terraces rising about 15 m up the hillside.



VISUAL NARRATIVE: *Villa Lante, Bagnaia*





Terrace 1

The gardens of the Villa Lante are the villa's principal fame, especially the water features, from cascades to fountains and dripping grottos

The main feature of this parterre is the complex fountain at its centre, formed of four basins, separated by parapeted walks, the parapets decorated with stone pineapples and urns that intersect the water. At the heart of the complex, a centre basin contains the celebrated Fontana dei Mori by Giambologna: four life-sized moors stand square around two lions; they hold high the heraldic mountain surmounted by the star shaped fountain jet, the Montalto coat of arms. This is the focal point of this unusual composition of Casini and parterre.

A feature of Italian gardens is the lack of flowers and the dominant 'chiaroscuro' effects created by sculpted trees and shrubbery. The pines and cypress from the adjacent, less formal hunting park add a contrasting backdrop.

Terrace 2

On the next (third) terrace a massive stone table has water flowing down its centre. Here, Cardinal Gambara would entertain his guests with picnics. On this terrace are yet more fountains, depicting river gods. Above this terrace is the fourth, containing the catena d'aqua a water feature (gioco d'aqua) that Vignola added to several 16th-century gardens.

Terrace 3

- On the next upper terrace are yet further fountains and grottos, and two small casini which frame further fountains completing a composition known as the 'theatre of the waters'.
- These small casini, like their grander relations on the lower terrace, are of distinguished design, probably again by Vignola, with open loggias supported by Ionic columns. They bear the name of Cardinal Gambara engraved on the cornices.

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SCHOOL OF BUILDING AND ENVIRONMENT

DEPARTMENT OF ARCHITECTURE

SAR1401 – INTRODUCTION TO LANDSCAPE ARCHITECTURE

UNIT – III – LANDSCAPE DESIGN AND CONSTRUCTION

Principles of Landscape Design

Landscape designers use these principles of design to create landscape designs that are both functional and aesthetically pleasing.

Landscape design principles include

- Focalization or Emphasis
- Proportion and Scale
- Balance
- Order and Unity
- Repetition
- Rhythm
- Sequence or Transition
- Contrast and Harmony

Focalization or Emphasis

Focalization or Emphasis directs visual attention to a point of interest or prominent part of the landscape design. This could be a hanging earth-forms sculpture, a stone-finished Corinthian garden fountain. Emphasis refers to those garden elements which initially seize attention and to which the eye continually returns. It is the creation of the more important and the less important elements in the garden. The parts of any composition should not be equal in their visual interest.

Figure 3.1 Focalization is created as a visual break in the sequence and flow of the landscape

Proportion

- Proportion is the relationship that exists among the components of a landscape.
- It also describes the relationship between the components of the landscape and the landscape as a whole.
- Proportion involves the size relationships between and among the components making up the landscape
- Proportion describes the size relationship between parts of the landscape design or between a part of the design and the design as a whole.
- A large fountain would cramp a small backyard garden, but would complement a sprawling public courtyard.

Scale

- Scale is the human perception of the size of space and form related to the human dimension.
- Scale is relative to the perception of the viewer. For a large two-story house, corner plantings that are proportional to the house may appear out of scale to the viewer.
- Relationship between the size of an object to the size of the other objects. within the same composition

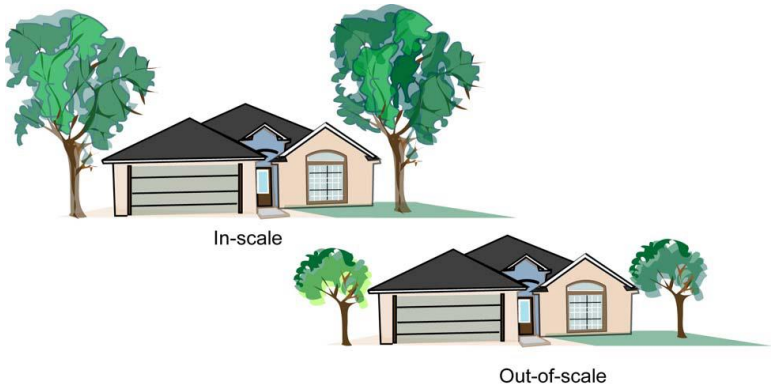


Figure 3.2 Proposition and scale

Symmetrical or Formal Balance

It is achieved when the mass, weight, or number of objects both sides of the landscape design are exactly the same.

Figure 3.3 Formal balance

Asymmetrical or Informal Balance

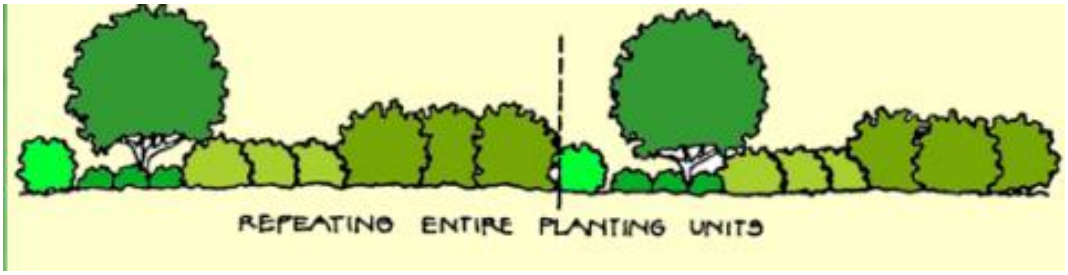
- In landscape design suggests a feeling of balance on both sides, even though the sides do not look the same.
- Asymmetrical balance in visual attraction may be achieved by using opposing compositions on either side of the central axis.
- This form of balance often has separate or different themes with each having an equal but different type of attraction.

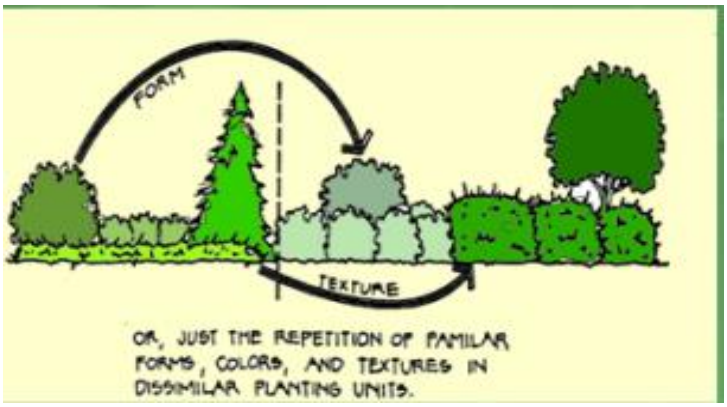
Figure 3.4 In Formal balance

Order and Unity

- Order is the overall organization and structure of a design**.** It is the basic scheme or "skeleton" of the design. Order is created and carried out through the composition. Examples of order in a design may be symmetrical versus asymmetrical balance or a formal versus naturalistic arrangement.
- Unity refers to the use of elements to create harmony and consistency with the main theme or idea of the landscape design.
- Unity gives the landscape design a sense of oneness and interconnection.
- Unity in landscape design can be achieved by using plants, trees, or material that have repeating lines or shapes, a common hue, or similar texture.
- Consistency creates unity in the sense that some or all of the different elements of the landscape fit together to create a whole.
- Unity can be achieved by the consistency of character of elements in the design. Character, means the height, size, texture, color schemes, etc. of different elements.

Repetition Strengthens Unity





Whenever three elements of the same kind are grouped together there is a strong sense of unity

Repetition

- **Repetition** is the continuing thread in a garden and is generally defined as duplication. When any design element is repeated the mind is better able to understand the composition as a whole and so a sense of order is introduced.
- Repetition involves repeating or using an element more than once throughout a design. It helps establish and add order and unity to a design. Repetition provides a common feature throughout the design that pulls the design together.

Figure 3.5 Repetition

Rhythm

Rhythm creates a feeling of motion which leads the eye from one part of the landscape design to another part. Repeating a color scheme, shape, texture, line or form evokes rhythm in landscape design. Proper expression of rhythm eliminates confusion and monotony from landscape design.

Figure 3.6 Rhythm

Sequence or Transition

- Sequence or Transition creates visual movement in landscape design.
- Sequence in landscape design is achieved by the gradual progression of texture, form, size, or color.
- Examples of landscape design elements in transition are plants that go from coarse to medium to fine textures or soft scapes that go from large trees to medium trees to shrubs to bedding plants
- Natural transition can be applied to avoid radical or abrupt changes in landscape design. Transition is basically gradual change.
- Sharp transitions occur most often in formal landscapes and form hard edges. An example of this landscape design idea is putting a brick mowing strip to break the transition from the mulch in your planting bed to your lawn.

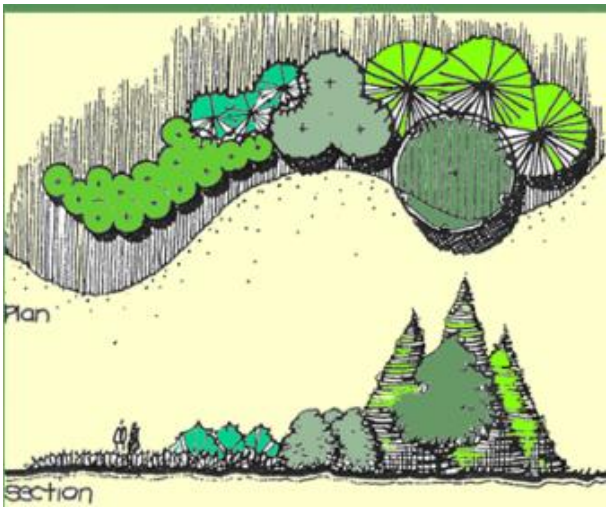


Figure 3.7 Types of Sequential Change Within Planting Units

Contrast and Harmony

- Harmony is a quality of relatedness
- Found in similar plant forms, similar textures, similar qualities of line and closely related colors.
- Aesthetic impact of Harmony depends on simultaneous perception of both similarities and differences.
- We perceive the world as a pattern of similarities picked out as different from its background.
- Harmony and contrast go together; neither can exist without the other.
- Contrast is found between different plant forms, strikingly different qualities of line, texture and colour.

Figure 3.8 Contrast IN Texture Uniform Form

VISUAL CHARACTERISTICS OF PLANTS

Line

In garden design, the form of a line creates a sense of direction as well as a sense of movement. The eye automatically follows a garden line, whether it be the edge of a walkway, the curve of a flower bed, or the outline of plant materials.

The character of a line yields specific responses. Gentle, slow curves and horizontal lines tend to be experienced as restful while jagged diagonals or vertical lines create more excitement and tension.

Line plays an important role in a landscape. This design element causes physical and/or visual movement**.**

- Line leads the viewer's eyes through the landscaped space.
- It defines and delineates space.
- As a designer, incorporate line into a landscape by using contrasting plant material and by forming patterns with similar plant materials. Pattern is line organized in a repetitive sequence.
- Examples of lines created in a landscape include ground patterns, edges of contrasting plant materials, and tree tops meeting the sky.
- Steer physical or visual movement directly through the environment. Use straight lines to represent formality or a contemporary concept.
- Intersecting straight lines suggest hesitation, change of view or direction, or a pause.
- Meandering or curved lines suggest a more relaxed, slower movement. Use these to create a casual, informal concept.
- In curvilinear design, lines should be dramatic, done with a sense of flamboyancy and be very expressive in their shape. Curvilinear lines that have weak, scallopy edges will not be visually interesting or pleasing to the eye. Curvilinear, meandering lines suggest a naturalistic look that invites the user to casually stroll through and experience the landscape.
- On the other hand, linear lines such as those found in a straight hedge or the edges of paving materials suggest quick, direct movement. Angled lines can create opportunities for creating the "bones or the framework of the landscape". Lines that interconnect at right angles create an opportunity for reflection, stopping or sitting.

- Through skillful use of lines in the landscape, the designer is able to direct the attention of the viewer to a focal point.
- Line creates order by directing eye movement or flow. Lines in a landscape design give the eye directions about where to look. Lines may be used to draw attention to an object, divide a space, group related objects together, or separate unrelated objects in landscape design. In landscape design, these can be achieved through the arrangement of plants and borders.
- Line is also created vertically by changes in plant height and the height of tree and shrub canopies. Line in a small area such as an entrance or privacy garden is created by branching habits of plants, arrangement of leaves and/or sequence of plant materials.

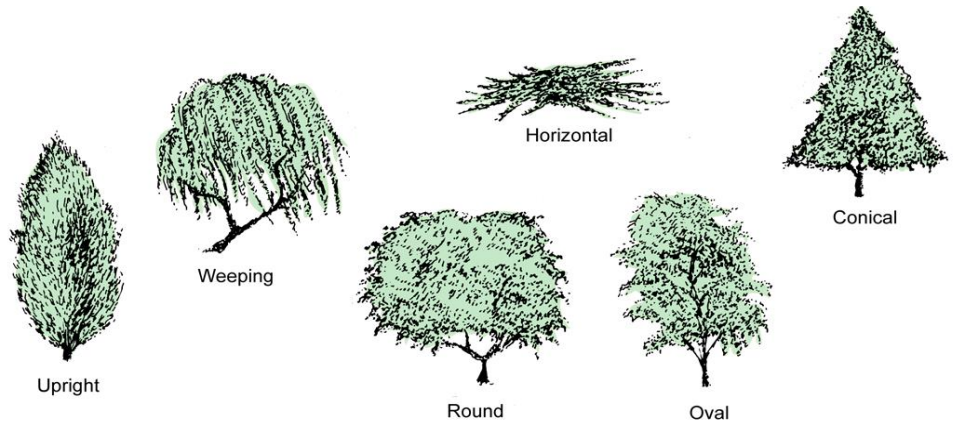
Figure 3.9 Linear / Curvilinear Lines

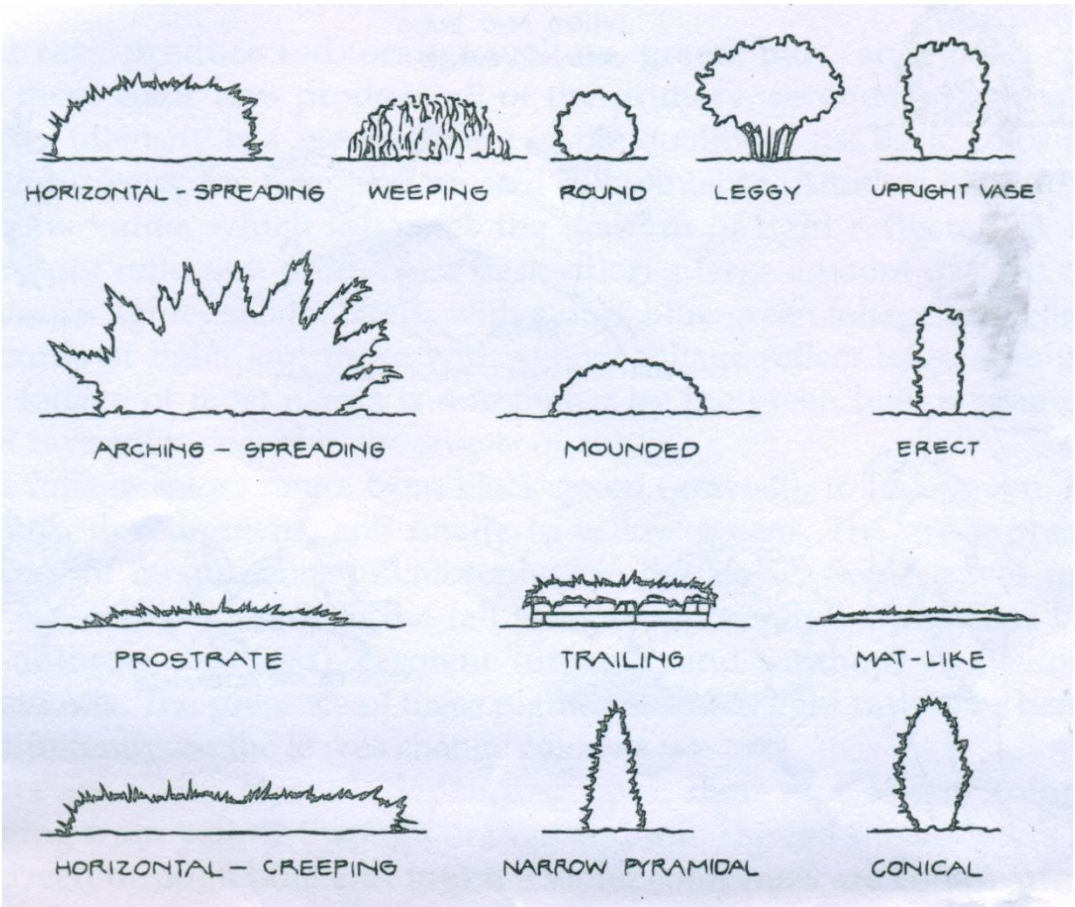
Fig 3.10 Effective Use of Curvilinear

Form

- Form defines the shape and structure of an object. In landscape design, form indicates the shape of a plant and the structure of its branching pattern. Tree forms are defined by branching pattern, while shrub forms are determined by growth pattern.
- Form is the two or three-dimensional shape and structure of an object or space. Whether it is two or three dimensional, form is line surrounding mass
- The shapes of trees and the areas of grass bound by edging are examples of form expressed in a landscape. The air space created by two plant materials set side by side is also an expression of form.
- All the components in a landscape have a distinctive and natural form. The forms of plants contribute to the total design composition. The basic form of each plant depends on the plant's natural growth habit. Some of the more common forms of landscape plants include round, conical, oval, weeping, horizontal, and upright.

- When horizontal forms are placed together as is the case in the hedge, the individual vertical forms take on a horizontal profile





- Weeping, drooping of pendulous forms can also be used to create softer lines or as interesting accents in the garden

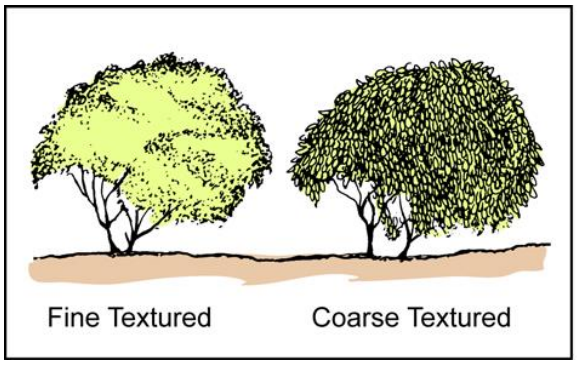
- There are also rounded or globular forms that are useful in creating large masses.
- Most deciduous trees and shrubs have a rounded form. A conical form is characteristic of many evergreen trees.
- Evergreen shrubs have more of a horizontal form.
- The concept or theme for a landscape dictates which forms are most appropriate within that concept or theme.
- Formal concepts suggest the use of very tailored forms of plant material and ground beds. Such a formal landscape would include very straight, crisp, and precise planting beds; topiaries; and other visually clean-lined plants.
- Informal or woodland concepts mandate much more irregular or natural forms. Casual curving ground beds and loosely branched trees and vines have forms to satisfy this concept.
- Use vertical forms for strong accents and for adding height. Horizontal or spreading forms add visual width to tall structures.
- Incorporate weeping or drooping forms to create soft lines and to provide a transition to the ground plane.
- Every plant has a distinct growth-habit, a unique mass and volume which develops and changes as the plant matures. These shapes, whether pyramidal, weeping, columnar, spreading, or round, divide and define the spaces in the garden. Some forms are more dramatic than others and so attract attention.
- The siting of a specific plant may block a view, or open a sight-line, or alter the view depending on the maturity and growth-habit of the plant--open or compact, herbaceous, evergreen or deciduous.
- These plant qualities often change with the seasons and restructure the lines of the garden.
- The form of the plants selected and their placement are critical to creating comfortable, dynamic spaces and pleasing silhouettes.

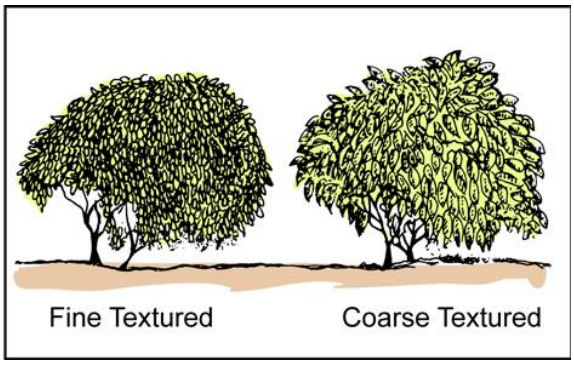
Texture

Texture is the surface quality of an object. Texture is how something feels when it is touched or looks like it would feel if touched. The coarseness or smoothness of the leaf, bark, and foliage of plants and trees and of buildings, patios, and walkways define texture in landscape Design.

Texture in Landscape Is Defined In 3 Groups

- **Coarse** includes plants, structures and hardscapes that are bold and large.
- **Medium** texture takes in many plants and smaller structures.
- **Fine** includes plants such as ferns and grasses and structures that are thin and delicate.





- Texture is the surface quality of any plant material or structure in the landscape. It is the feature of a plant or structure's physical surface qualities as determined by form and size.
- Texture is also a feature of the aggregation of the minor units that make up the plant or structure.
- Texture is relative. It must be seen as a comparison. Texture is analyzed by comparison between objects, by association of these objects with each other, and by distance.
- Texture is associated with the senses of touch and sight. Referring to the physical surface of plants (smooth, rough, shiny, or dull), texture is tactile.
- Texture is also viewed as the organization of the size and arrangement of a plant's component parts (leaves, stems, and branches).
- In addition to being a physical feeling like rough or soft, texture also describes how one perceives a visual difference. For example, the leaves of one plant are rough and coarse when compared to the smaller leaves of a second plant.
- However, when compared to the larger leaves of a third plant, the smaller leaves of the first plant appear smooth and fine. As another example, consider coarse-grade pea gravel.

- Texture in the garden creates sensual and visual excitement**.** It is generally read as the mass and void of foliage, bark, or flowers and changes with the light during the day and with the seasons.
- Up close, the size and shape of the leaves and twigs become the predominant textural elements of a plant. From a distance, it is the quality of light and shadow on the entire form, the patterns of light and dark, that translates as texture.
- Rough, coarse textures tend to create an informal mood and are visually dominant, while fine, smooth textures are associated with formal, elegant, subdued moods and are visually more passive.
- Fine-textured plants are visually translated as being farther away, so fine textures can be a tool for providing a sense of perspective in a small garden and making the space appear larger.
- On the other hand, the predominance of coarse-textured plants make a garden space appear smaller. Strong textural contrasts add drama and interest to a garden. Bark and foliage are two ways of adding textural interest to any space.
- In terms of the overall planting plan, texture must balance in relationship to the axis. Weight on one side should equal the mass on the other side of the axis.
- Texture in the landscape depends upon the distance from which the plant is viewed by the observer. In distant views, the overall mass of the plant is the dominating feature and the fineness or softness of a leaf or branching pattern is lost.

Color

- Color is used to convey emotion and influences the mood and character of the overall landscape design or parts of the design.
- It has three properties: hue or Chroma, value, and intensity. Hue or Chroma refers to the relative purity or strength of the color. Value determines how light or dark the color is, whereas intensity refers to how bright or dull it is.
- Color adds the dimension of real life and interest to the landscape.
- Colors can also be used to direct your attention to a specific area of the garden. A bright display among cooler colors would naturally catch the eye.

- Bright colors like reds, yellows and oranges seem to advance toward you and can actually make an object seem closer to you. Bright colors excite or stimulate emotional responses.
- Cool colors like greens, blues, and pastels seem to move away from you and can make an object seem farther from you. The cool colors of blue and green express restfulness and coolness. These colors are associated with ice, sky, and water.
- Cool colors have a receding visual effect. These colors provide the viewer with a sense of depth. Cool colors make the object of interest appear to be receding into the background. Subdued or cool colors slow down emotional responses and express a sense of restfulness.
- Grays, blacks, and whites are considered neutral colors and are best used in the background with bright colors in the foreground. However, to increase depth in a landscape, you can use dark and coarse textured plants in the foreground and use fine textured and light colored plants in the background.
- Warm colours such as reds, oranges and yellows tend to advance towards to viewer while blues, violets and greens tend to recede into the landscape. Warm colours read well and affect the eye more quickly than do cool colours. When using warm colours, they should be used in sequence which must be smooth and gradual
- Yellows, reds, and oranges are warm and advancing colors. These colors are associated with warmth because they are the colors of the sun, fire, and heat. Warm colors add a dramatic and excited feeling to an environment.
- These colors appear to advance and move toward the viewer. Warm colors can infuse a high energy level into those with whom they have contact. Objects or plants with these colors stand out and are the first to be seen.
- Warm, yellow sunlight and cool, blue moonlight have very different effects on color in the landscape. Artificial lighting also has a dramatic impact on color.

- To vigorously use colour and effective colour combinations requires a thorough knowledge of plants, their colours and seasonal changes with detail of twig, leaf, flower and fruit as well as principles of color.

As a designer, consider several factors concerning the influences of color in a landscape design.

1. People have a psychological tendency to "lean toward" light and vivid colors.

2. Bright light and warm colors excite emotional responses. These conditions encourage the viewer's eyes to move throughout the landscape.

3. Subdued light and cool colors are more conducive to moody reflections of thought.

4. Warm colors (red, yellow, orange) appear nearer or advanced. Cool colors (blue, green) appear receded or farther away.

5. Plants or plant masses must blend with their surroundings. If a color change is desired in a plant mass, proceed in a sequence. A gradual color change in the plant mass maintains the continuity in the design.

6. Colors and textures relate. Delicate colors (tints and pastels) express fine textures. Earth-tone colors (brown, rust, red) express coarse textures.

Plants as landscape Design Elements

Planting Design

"Is the selection and placing of suitable plants within the overall design of the Landscape, so that the plants chosen perform specific functions and create the desired visual effect."

- Characteristics of individual plants.
- How plants can be used to fulfill various design requirements

Classification of Plant Material

- Size
- Habits of Growth
- Form
- Flowering characteristics
- Foliage characteristics
- Growth rate and life span
-

Spatial Functions Of Plants In The Human Landscape

- Ground level
- Below knee height
- Knee–eye level
- Above eye level

Plant Material – Natural Resource

Valued natural resources

- Capture solar energy and make it available to food chains
- produce oxygen
- Purify water
- Influence micro climate

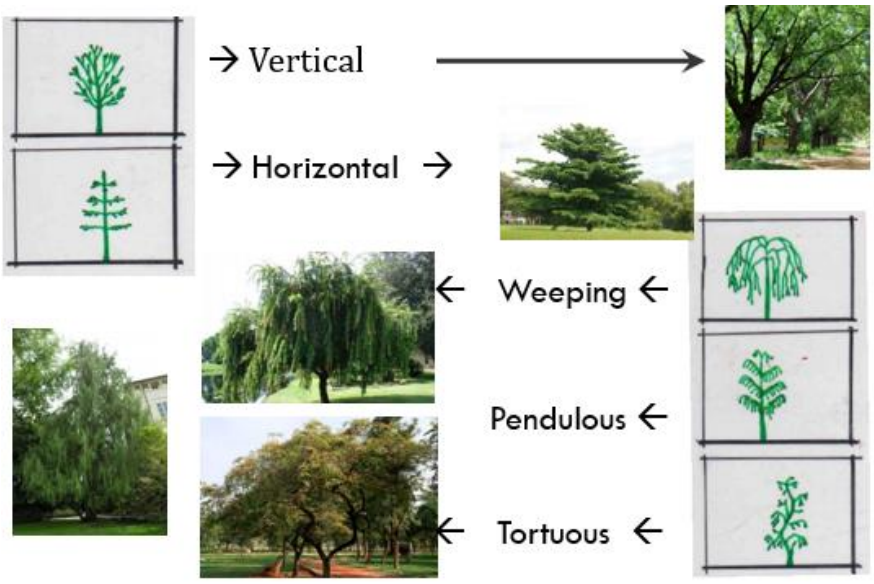
Classification - Size

TREES – Plants having a single stem growing to a height greater than 5 m.

SHRUBS - Woody plants and are often multi-stemmed and low branching.

GROUND COVERS - Low growing, prostrate, surface covering plants.

Plant Habit



Flowering Characteristics

- Season
- Color
- Density and distribution of flower.
- Botanical characteristics of flowers – Single, cluster etc.,
- Presence or absence of foliage during flowering period.

Foliage Characteristics

TEXTURE: Visual grain or coarseness of a perceived surface.

- Leaf size
- Twig and branch size
- Bark articulation
- Growth habit
- Viewing distance

Growth Rate and Life Span

Fast Growing Species

- Have shorter life
- Have sparser foliage

- Use: Appropriate in situations where quick results are desired

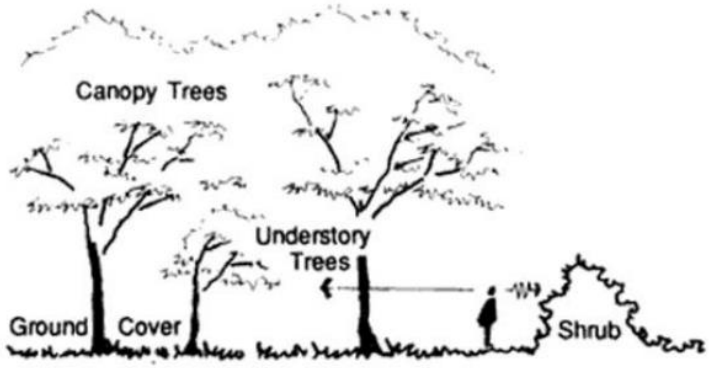
- Windbreaks
- Shelterbelts
- Nurse plants

Slow Growing Species

- Longer life
- Sustained environmental benefits
- Roadside Planting
- Campuses
- Townships
- Public Landscapes

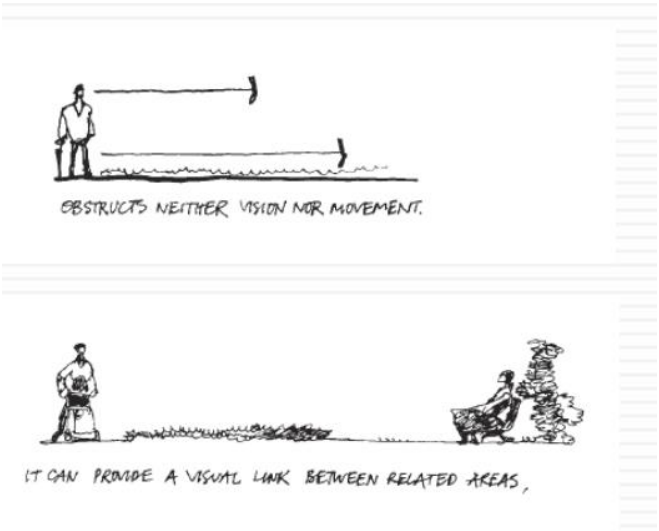
Spatial functions Of Plants

- Above eye level
- Waist–eye level
- Knee–waist height
- Below knee height
- Ground level



Ground-Level Planting

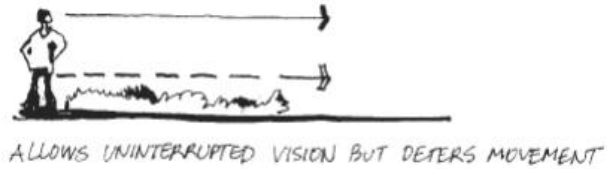
Carpeting Plants



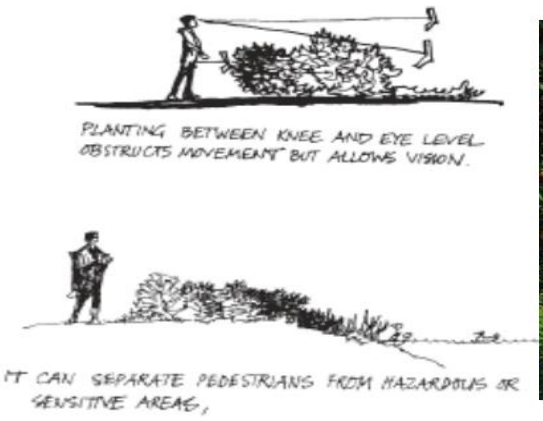
Its primary spatial role is as a 'floor' that allows both free vision and movement.

Planting Below Knee Height

Low Planting

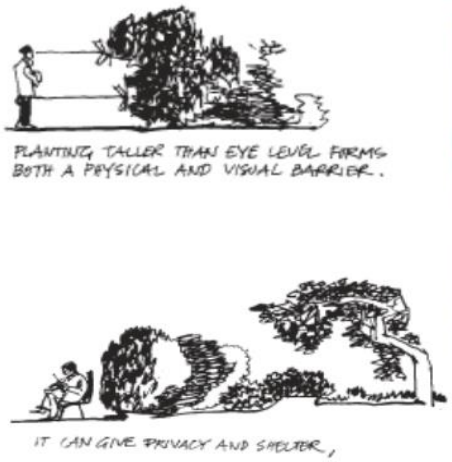


Knee to Eye Level Planting

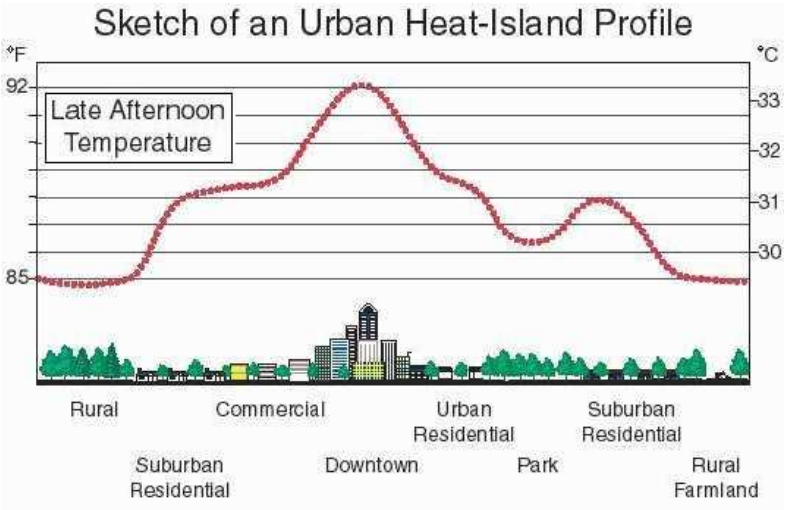


Medium Shrub Planting

Tall Shrub Planting

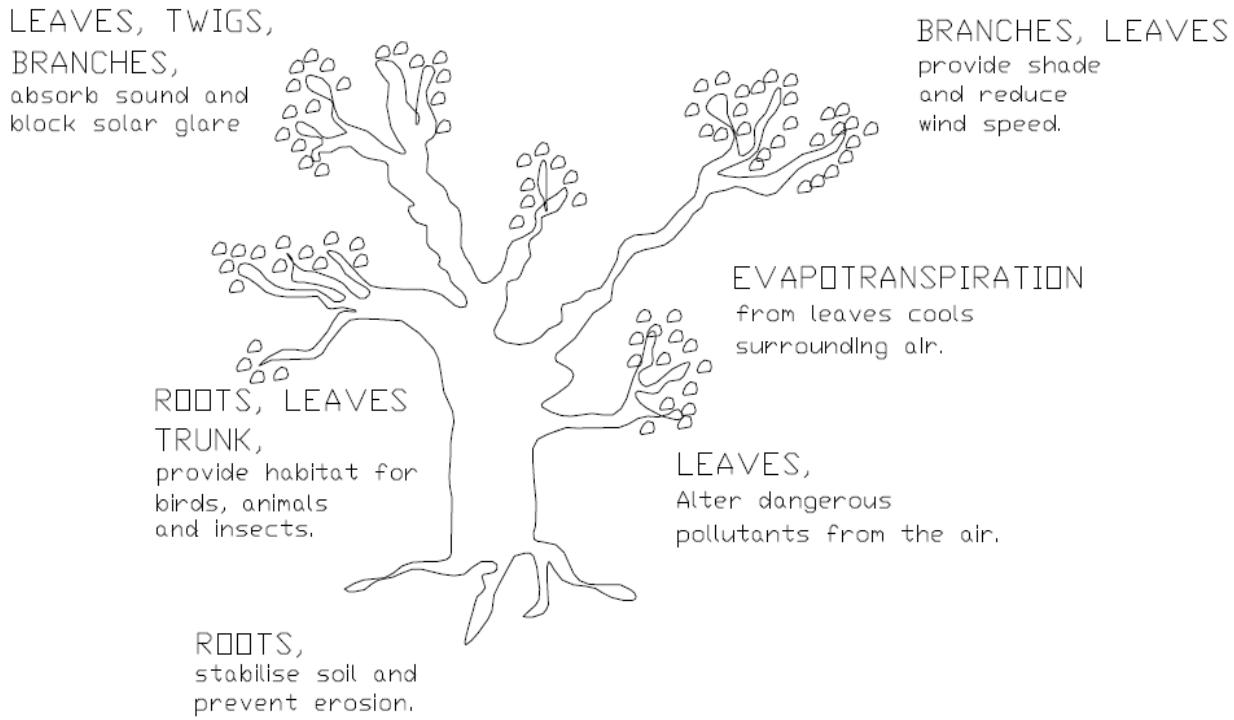


Urban Heat Island



A study of plantation for energy conservation, reports that "as much as 70% - 80% of the energy conservation benefit of trees may be attributed to reduction in 'urban heat island' through the evapotranspiration effect of trees".

Ecological Qualities of Trees



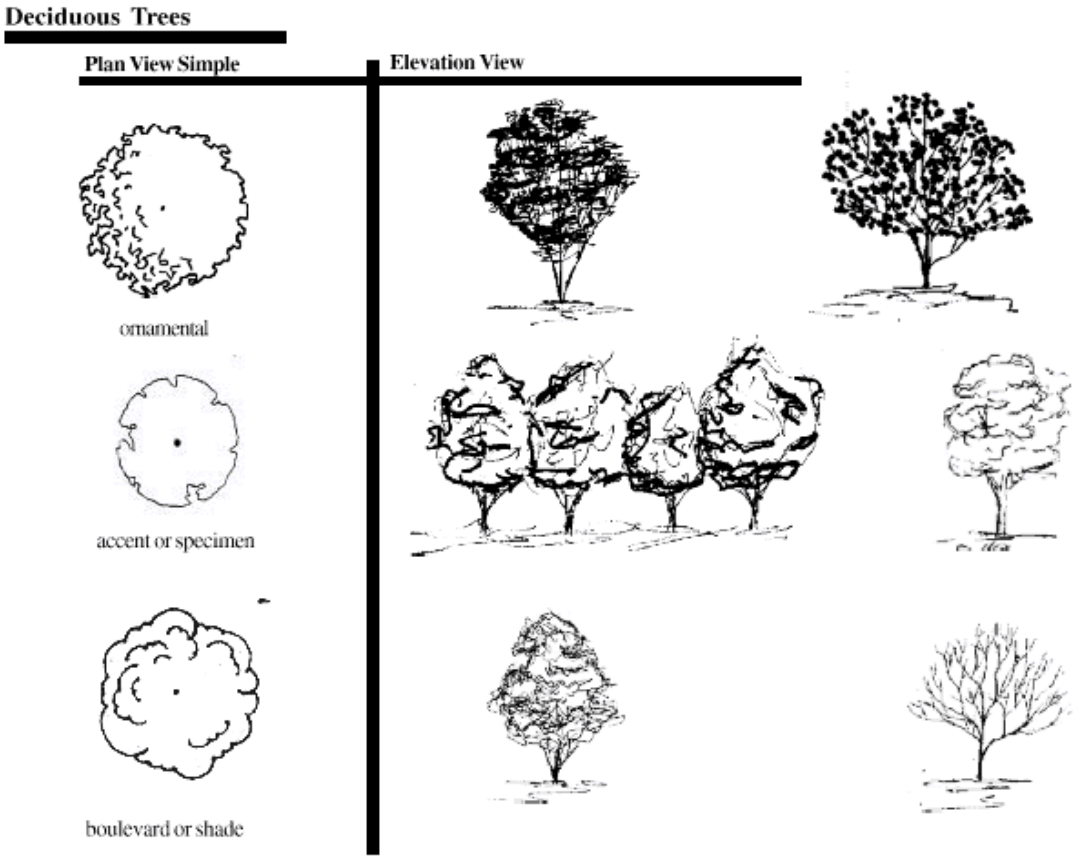
The leaves alone can provide cooling from evapotranspiration, shelter from wind, sound absorption, and sequestering of carbon dioxide

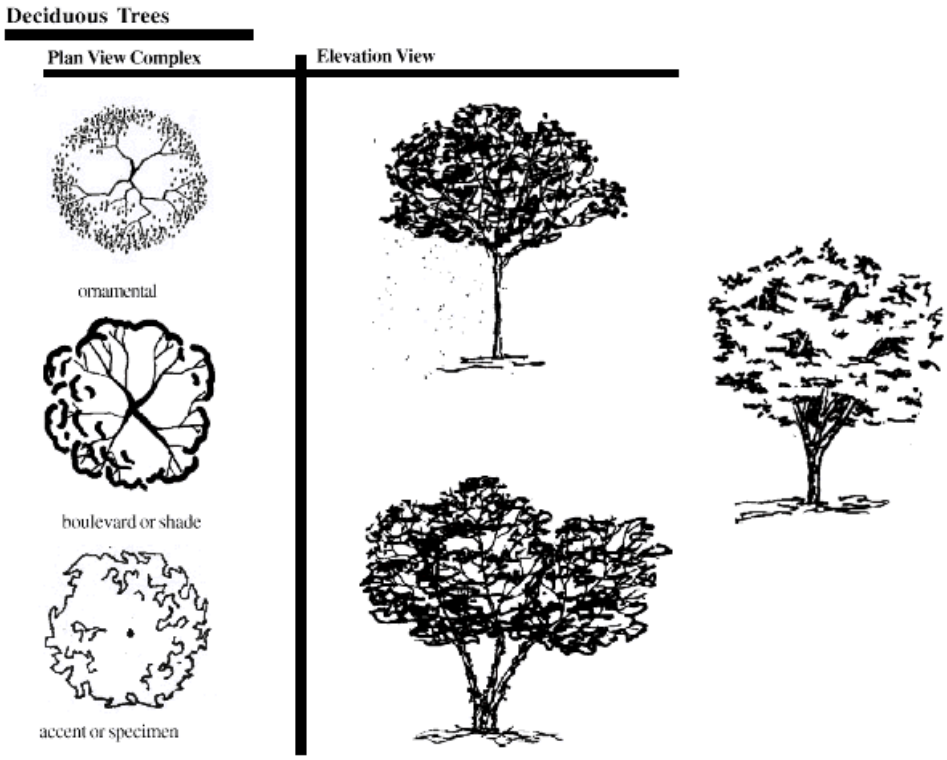
- Grass is also cooler than exposed soil surfaces, the difference in temperature being between 5 ^{o}C - 6 ^{o}C. The temperature differential may be much greater between grass and paved surfaces.

- Furthermore, there is a considerable difference in temperatures between paved surfaces made of different materials. On a bright day**,** concrete and similar light colored surfaces will reflect from 25 to 35 percent of the incident light, while grass surfaces, reflect only about 10-15 percent of the incident light.

- To achieve efficient shading, trees have to be placed strategically. As the **sun** is at low angles in the morning and late afternoon, trees should be placed facing southeast and southwest of the building. The trees will cast long shadows which can be utilized effectively on those sides which are otherwise difficult to protect from the sun's heat at this time of the day.

- Vines provide a very fast growing sources of shade for a building, because they require little space for growth. Thus these are most useful where space around the building is limited.





Florescent Trees (Smell)

- Couroupita guianensis Nagalingam
- Mimusops elengi Indian medlar
- Nyctanthes arbor -tristis Night jasmine
- Canaga odorata Ylang-ylang
- Citrus lemonia Lemon
- Jack fruit
- Karuveppalai
- Psidium guajava Guava

Shade Trees

- Mangifera indica Mango
- Tamarindus indica Tamarind
- Azadirachta indica Neem

Sound Trees

- Bambusa Bamboo
- Ficus bengalensis (Banyan)

Florescent Shrubs (Smell)

- Jasminum sambac Arabian jasmine
- Nyctanthes arbor -tristis Parijatha பவிழமல்லி

Flowering Trees

- Butea monosperma Flame of the forest
- Cassia fistula Indian laburnum
- Delonix regia Gulmohar
- Lagerstroemia parviflora
- Samanea saman Rain tree / Monkey pod
- Tabebuia rosea Rosy trumpet tree
- Thespesia populnea Indian tulip
- Peltophorum ferrugineum Yellow gulmohar
- Cassia javanica Java cassia

FLOWERING SHRUBS

- Hibiscus rosa sinensis
- Ixora chinensis Ixora hybrid
- Nerium oleander Arali
- Tabernaemontana coronaria Nandiavettai
- Tecoma stans Yellow bell
- Allamanda nerifolia

Ornamental Trees

- Plumeria alba Pagoda tree
- Callistemon lanceolatus Bottle brush tree
- Thuja orientalis Thuja
- All palm varieties

Ornamental Shrubs

- Adenium
- Ficus benjamina variegata
- Dracena marginata
- All palm varieties

Foliage Shrubs (Hedges)

- Duranta Sp.
- Clerodendrum inerm
- Glory Bower, Indian privet

Compositional Elements of Landscape Design

1. Water
2. Landform
3. Structures
4. Vegetation
5. Climate

Water

In planning the use of land areas in relation to water ways and water bodies, a reasonable goal would be to take the full advantage of the benefits of proximity.

These benefits would fall in the following categories

1. water supply, irrigation and drainage
2. Use in processing
3. Transportation
4. Microclimate moderation
5. Habitat
6. Recreational use
7. scenic value
8. Site amenity
9. Water as landscape feature

Types of Water Features

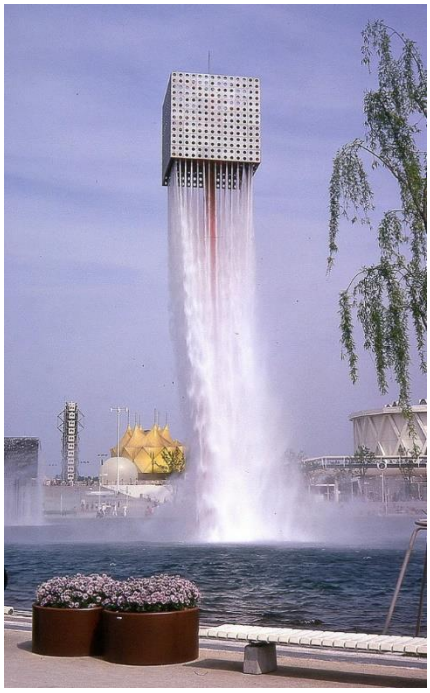
PONDS are often the beginning of a landscape design and water features of this kind may be any size and shape, may feature seating around the edges, and can have either a formal style or a natural appearance.

FOUNTAINS are also popular water features and enhance your garden with the relaxing sights and sounds of moving water. Freestanding fountains and wall fountains are both possible options and can be found in a variety of styles and designs.

WATERFALLS are often integrated into the design of a natural pond, but can be planned into a swimming pool

- King Fahd's Fountain, World tallest fountain located in the city Jeddah, Saudi Arabia.
- It is named after King Fahd. It is known as the highest fountain in the world, as the maximum height achieved by the water is 312m (1023ft).

Floating Fountain



Climate

Design with Climate return to

There are two major considerations:

- Design for comfort - to make outdoor space which is 'cool when it hot and warm when it's not' design to celebrate the marvels of sun, wind, frost, rebirth and other climate-related phenomena design for plants

Design with climate - for comfort

- Domestic courtyards in China were planned according to climatic and symbolic criteria from the earliest times until the advent of 'modern' 'functionalist' architecture with Marxism and Leninism. Traditional practice was to orient buildings and courtyards on a north-south axis. In North China, which is cold, this caught the sun and gave protection from arctic winds. In South China, which is hot, this caught the breeze from the ocean. Deep porches were used, as in Indian and American verandah's, to (1) give deep shade in summer (2) allow the low winter sun to enter.

- In the temperate zone, gardens should be planned with sitting areas for as many climatic conditions and times of day as possible: winter afternoons, autumn afternoons, summer afternoons, summer evenings.

Design with climate - for enchantment

- The conditions of modern life require us to spend too much of our lives in climatically controlled buildings, detached from the natural world. For our leisure time there is a joy in appreciating the wonders of wind, sun, frost, dew, mist, growth and decay.

Climatic design for plants

- Gardeners often like to grow a wide range of plants from many parts of the world - which have different climatic requirements: wet/dry, hot/cool, boggy/well-drained, full-sun/half-sun/shade. This requires consideration at an early stage of the design process.

Landform

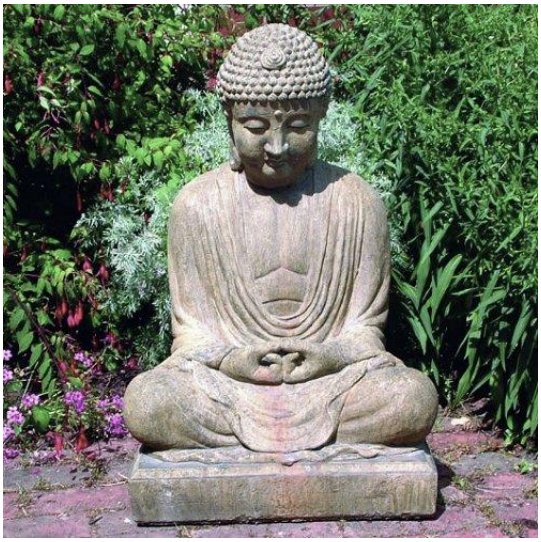
- Mounds
- Meadows
- Contours
- Terraces

Vegetation

- Trees
- Shrubs
- Herbs
- Grass

Structures

A **statue** is a sculpture in the round representing a person or persons, an animal, or an event, normally full-length, as opposed to a bust, and at least close to life-size, or large. Its primary concern is representational.



Sculpture is three-dimensional artwork created by shaping hard or plastic material, commonly stone (either rock or marble), metal, or wood. Some sculptures are created directly by carving; others are assembled, built up and fired, welded, molded, or cast.

A gnome is a mythical creature characterized by its extremely small size and subterranean lifestyle

Furnitures

Outdoor Living – Life- Stone Seating

Grading Basics

- Grading is the process *of* modification of existing landform to accommodate new structures, parking and circulation and to ensure positive drainage. Consideration must be given to utilities such as: water, gas, power, communication services, and sewerage for disposal of wastewater, and storm water.
- Grading process requires a careful change of contours so that they support the integration of building with the site.
- The land may be graded or adjusted to suit the architectural or engineering requirements, or the architecture may be adopted to meet variations in the ground level so that the original surface is disturbed the least.
- Extensive alterations in the landform may lead to unstable conditions resulting in erosion, landslides, floods, and a complete destruction of ecosystem.

Importance of Grading

1. The ground surface must be suitable for the intended purpose.
2. The visual result should be pleasing.
3. The result of any grading must have positive drainage.
4. The grading plans should attempt to keep new levels as close as possible to the original state of the land.
5. When ground is reshaped it should be done positively and at the scale of the machinery.
6. Top soil must be conserved wherever possible.
7. The quantity of cut should be approximately equal to the quantity of the fill.

Principles Of Grading Technology

Three principal goals in development of a grading plan are:

- Keep unwanted water from entering a building.
- Keep surface run off from creating damage to property or people during periods of heavy rainfall and subsequent runoff.
- To accommodate the structure on site with disturbing the site to minimum.

Gradient

- Gradient refers to the changing elevation along the Earth's surface or the

rate of the slope

- It is expressed in % or ratio or degrees.

  1% slope = 100:1

  10% slope = 10:1

- **Percentage of slope** is expressed as the number of meters (feet) rise in 100 m

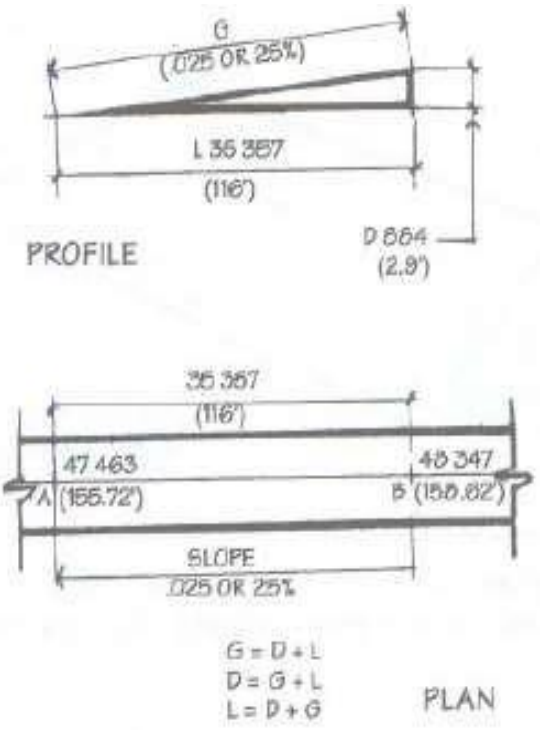
(100 ft.) of horizontal distance, typically referred to as rise/run.

- If the slope rises2 m (2 ft.) in 100 m (100 ft.), it is considered a 2 percent slope. The percentage of slope can be calculated by the following formula:

- Where D= vertical rise, mm (ft)

  L= horizontal distance, mm (ft)

  G = gradient, %



Elevation of point B=48 347 mm Elevation of point A =47 463 mm

Vertical difference D=884 mm Horizontal Difference L= 35 357 mm

Spot elevations

- Spot elevations provide additional information beyond that given by the contour lines. They indicate Micro grading.
- Spot elevations are used to establish limits of slope, to locate contour lines, and to provide detail for establishing control points that cannot be obtained via contour lines.
- Typical locations for taking spot elevations are:
    - Top and bottom of steps.
    - Tops of retaining wall.
    - Outside entrances to buildings.
    - Inside floor levels of buildings.
    - Corners of all structures.

Grading for Defined Area

- Slopes of less than about 2 percent in the open landscape appear flat to the human eye. However, in areas adjacent to build structures, even the slightest slope becomes noticeable because of the relationship of the grade to mortar joints, roof lines and other level architectural features.

Perimeter Edge Level:

Figures schematically illustrate alternative methods for manipulating a surface for drainage while allowing at least one peripheral edge to remain level.

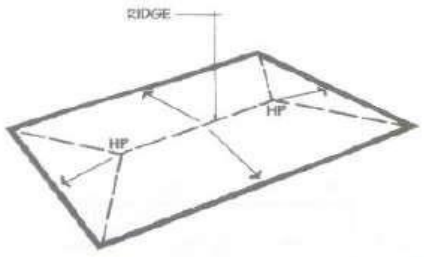


Figure 320-14. Perimeter edge level—drain from ridge line to all edges.

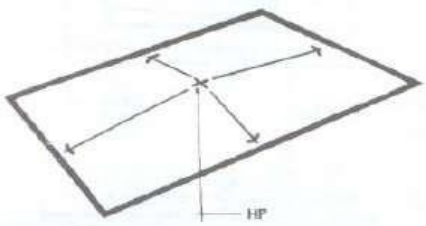


Figure 320-15. Perimeter edge level—drain from single high point.

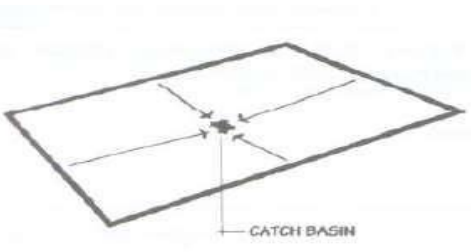


Figure 320-16. Perimeter edge level—slope to center drain inlet.

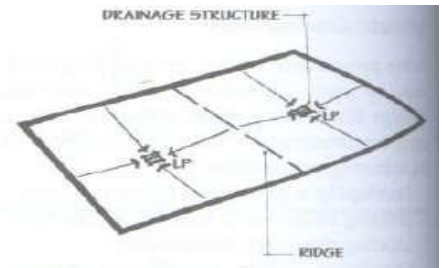


Figure 320-17. Perimeter edge level—all slopes to drain inlets at the same gradient.

Figure 320-20. Two perimeter edges level—slope from ridge line.

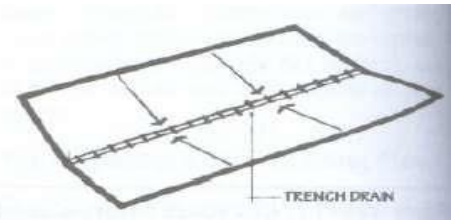


Figure 320-21. Two perimeter edges level—minimum slopes to trench drain.

Schematic Grading for Open Areas

Grading of a site should be thoughtful systematic process that begins with an analysis and understanding of the site and ends with an overall detailed Grading plan.

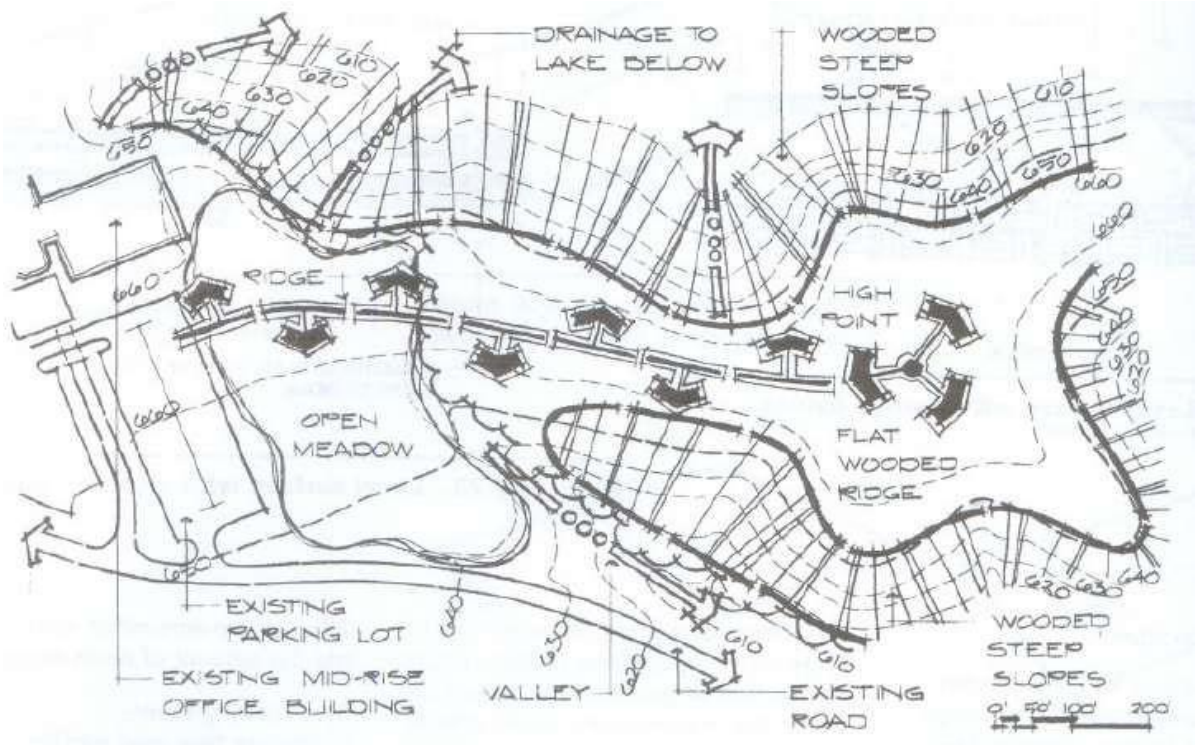
- Site Analysis:

Study the general lay of the land by using topographic maps and site visits.

1. Determine high points, low points, ridges, and valleys.
2. Note natural drainage systems and directions of flow that exist on the site.

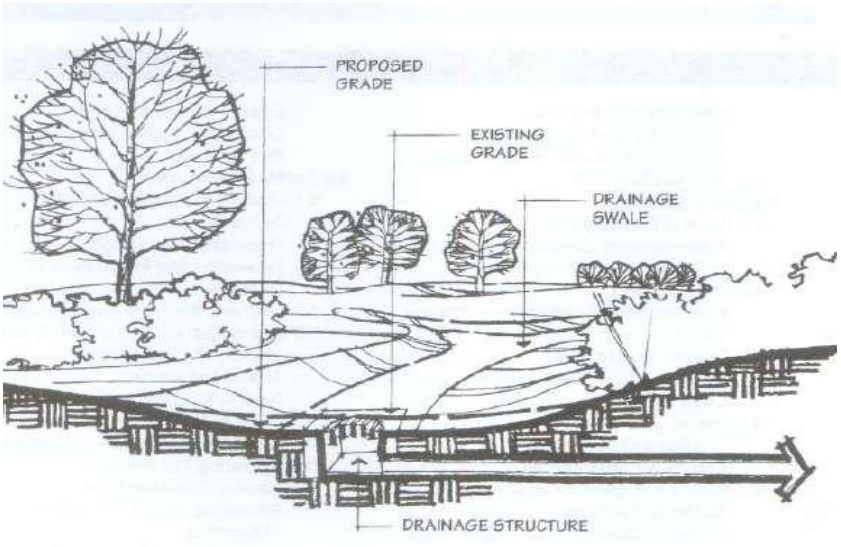
- Site use concept:

  Determine how existing landforms would affect proposed use areas, such as building locations, roads, parking areas, walkways, plazas, and lawn areas.



Cut and Fill

- The process of removal of earth from one part of site to achieve required grading and the place and using the dug up earth to achieve required grading by filling it at another place on the same sit.
- The amount of material from cuts roughly matches the amount of fill needed to make nearby embankments, so minimizing the amount of construction labour.



Pond Construction Details

Site Selection

- Appropriate site selection is one of the most important, before construction of the pond, the water retention capacity of the soil and the soil fertility has to be taken care.
- The selected site should have adequate water supply round the year for pond filling and other uses.
- The pond construction has to be based on the topographic area.
- In swampy and marshy areas, bunds should have a greater accumulation of soil to build the pond of a preferable size.
- Self-draining ponds are ideal for higher elevation areas.
- The site should be free from pollution, industrial waste, domestic waste and any other harmful activities.

Pond Construction

- An intelligent design and layout is a prerequisite for an efficient pond construction.
- The excavated earth should be used to construct the dyke and with a plodding slope towards the outlet for the proper draining facility.
- Preferably construction of pond has to be completed during summer so that the pond can be used for stocking.

Steps in Pond Construction

- Normally, the pond construction includes the following steps.
- Prepare the site by removing unwanted things such as the trees, bushes, and rock
- Construction of seepage-free and secure dyke by using the clay core
- Digging the pond and construction of dyke over the clay core
- Inlet and outlet construction
- Pond dyke covered with soil and plant grass species (avoid long rooted plants such as Rhodes grass and star grass)
- Pond should be fenced to avoid theft and entry of predatory animals

Site Preparation

- The place is cleared of ropes, cables and other items. Trees and bushes and other obstacles that hinder movement of heavy equipment around the site are to be removed - manually / animal power /using machinery.
- All vegetation including wood are to be cleared in the area (inclusive of 2 to 3 m beyond the dyke for workspace).
- Trees within 10 meters surrounding, tree slumps, large stones, are also to be removed.
- The surface soil which has the highest concentration of roots and organic material is not suitable for pond construction. Hence, about 30 cm of surface soil has to be removed.

Construction of Dyke

- Dykes should be compact, solid and leak free. A desirable dyke is constructed using 15 - 30 percent of silt, 45 - 55 percent of sand and 30 - 35 percent of clay.
- A sufficient width of the berm (not less than 1 m) is required to stabilize slope.
- The embankment slope in horizontal to vertical should be 2:1 in good quality clay soil and 3:1 for loamy silt or sandy soils.
- To raise the dyke, the clay buddle (1:2 sand and clay) is deposited as 10 - 15 cm thick layer and it can be formed at centre or inside the waterside of the pond.
- The crest of the dyke should be sufficient to help allied farm activities and the top of embankment should be above 1 m.
- Extra outlet is essential on the embankment as a safety measure to avoid damage due to excess raise in the water level.

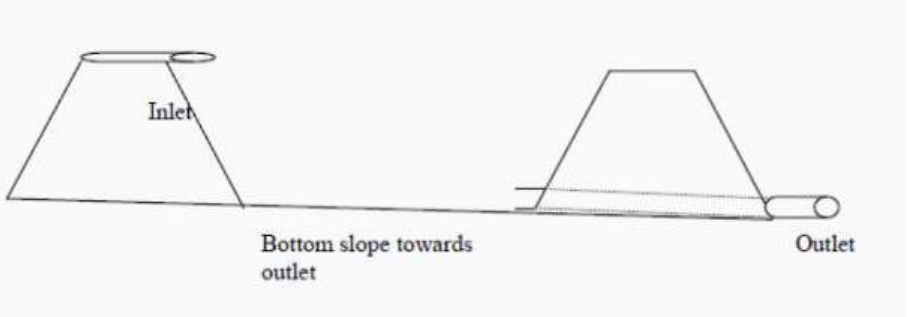
Pond Construction Types

- The ponds are constructed by two types namely, dug out and embankment pond.
- The dug out pond is constructed by digging the soil and is most suitable to construct ponds in plain areas. It is to be scientifically constructed maintaining shape, size, depth and other factors.
- Embankment pond is more appropriate for hilly areas.
- Dykes may be erected on 1 or 2 sides based on need.

- This pond is economically viable but not ideal for fish culture because the size, shape and depth of pond cannot be fixed as per scientific fish culture specifications.

Inlet and Outlet Construction

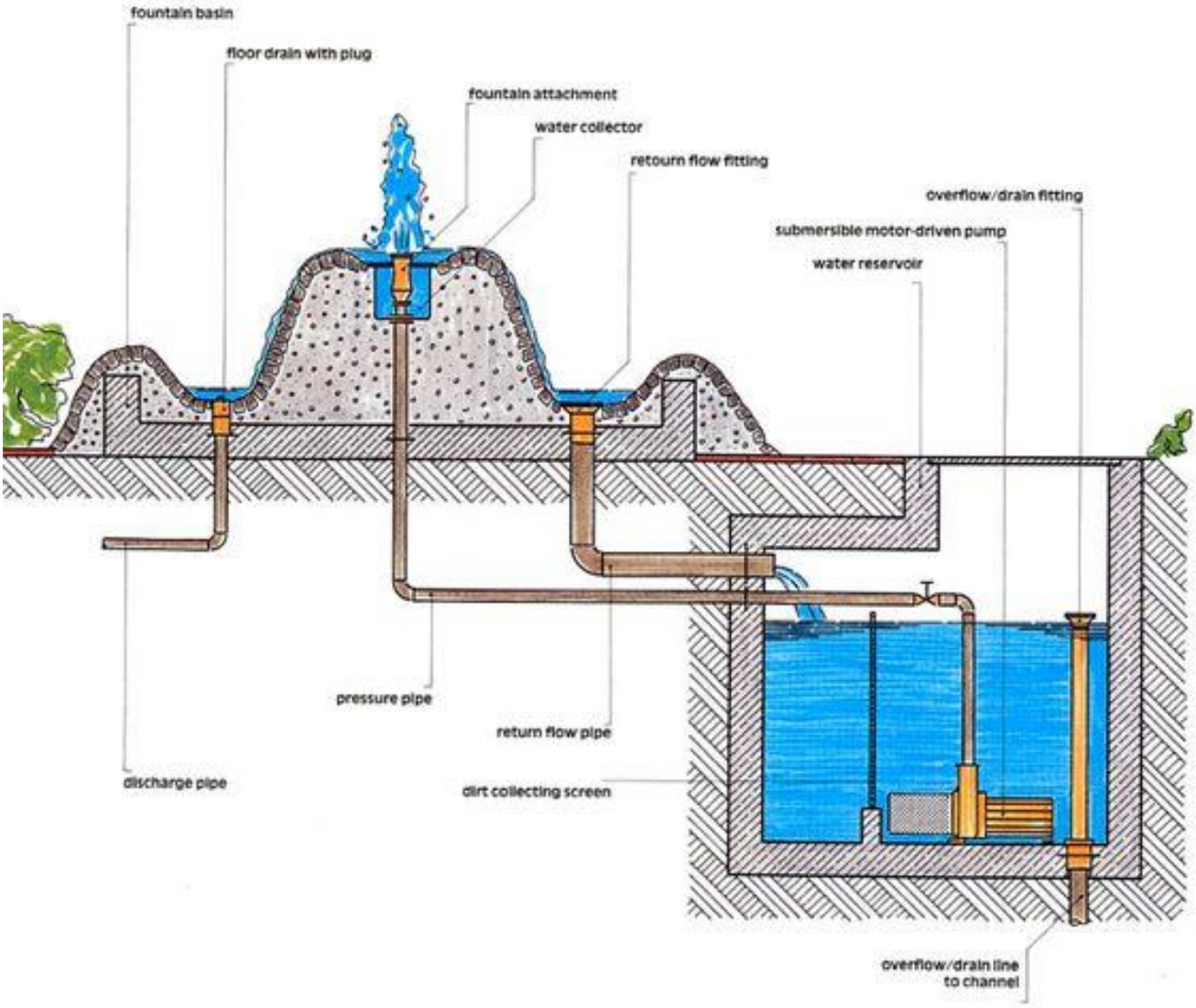
- Ponds are constructed to provide sufficient amount of quality water to the ponds except in ponds which are filled by s rainwater.
- Inlets are provided at top of the pond and screens are used to filter the pumped water to avoid entry of unwanted particles to the culture system.
- The inlet pipe size has to be designed is such a way that it should not take more than 1 or 2 days to fill the pond.
- The outlet pipe is set up at bottom of the pond.
- It is used to dewater the pond during harvest and partial draining for pond water exchange to maintain the water quality of the pond during the culture period. The outlet is constructed prior to pond dyke construction.



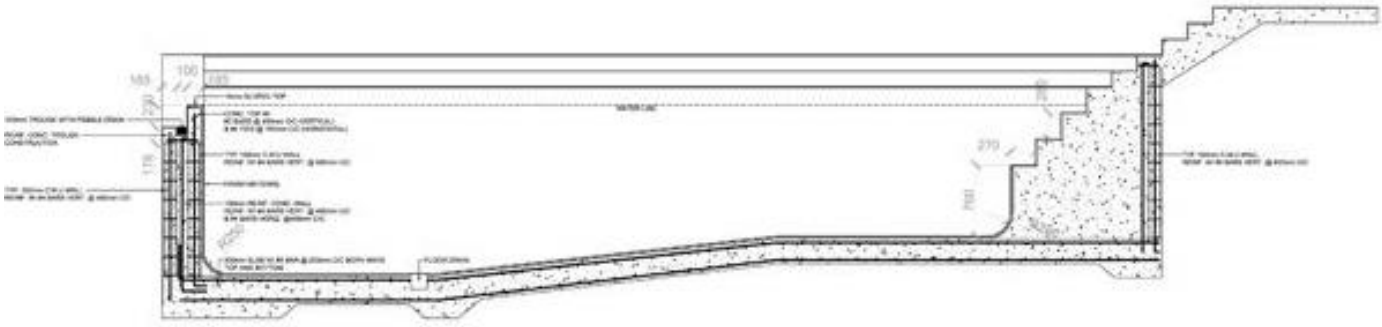
Soil and Vegetation Coverage of Dyke

- To reduce the soil erosion, creeping grass can be grown on the top and sides of dyke.
- The banana and coconut trees can be planted in the embankment.
- The slope of the embankment can be planted with grasses such as Hybrid Napier, gunny grass and elephant grass to supply feed to the grass carps reared in the ponds.

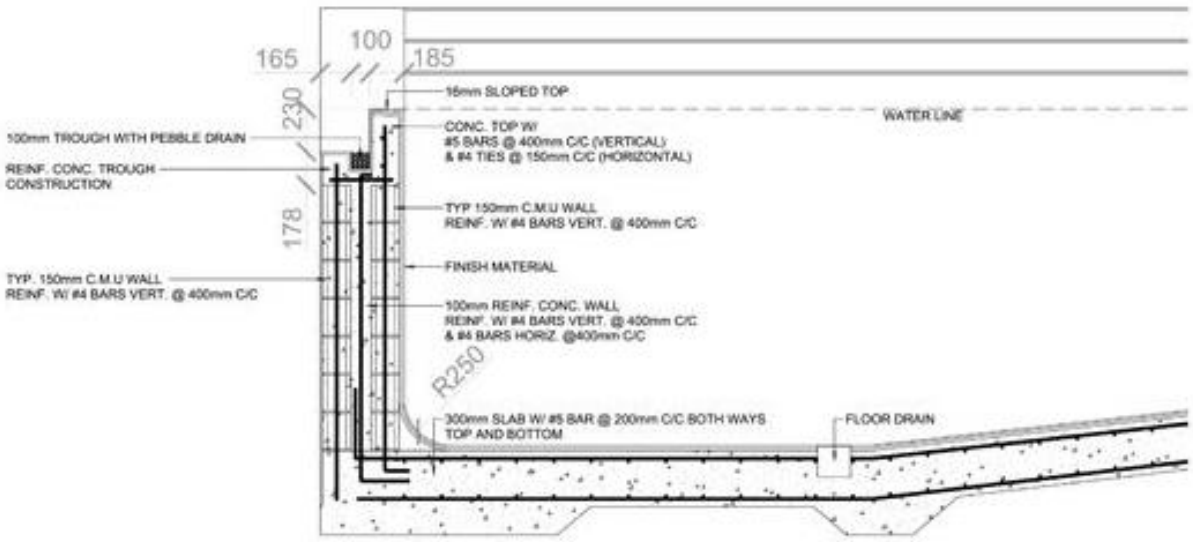
Fountain Details



Pool Construction Details



POOL SECTION
SCALE 1:50



TYP. INFINITY EDGE CONSTRUCTION DETAIL
SCALE 1:25

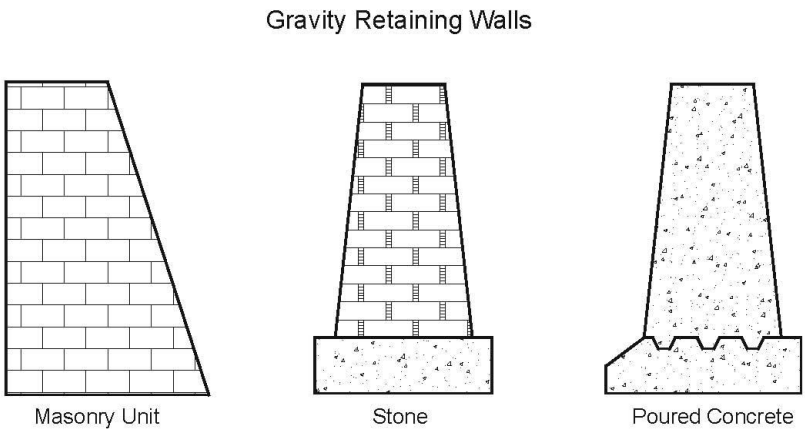
Retaining Wall Construction Details

Retaining walls are relatively rigid walls used for supporting soil laterally so that it can be retained at different levels on the two sides.

- Retaining walls are structures designed to restrain soil to a slope that it would not naturally keep to (typically a steep, near-vertical or vertical slope).
- They are used to bound soils between two different elevations often in areas of terrain possessing undesirable slopes or in areas where the landscape needs to be shaped severely and engineered for more specific purposes like hillside farming or roadway overpasses.

- A retaining wall that retains soil on the backside and water on the front side is called a seawall or a bulkhead.

Types of Retaining Walls



Construction Types

Gravity walls depend on their mass (stone, concrete or other heavy material) to resist pressure from behind and may have a 'batter' setback to improve stability by leaning back toward the retained soil. For short landscaping walls, they are often made from mortar less stone or segmental concrete units (masonry units). Dry-stacked gravity walls are somewhat flexible and do not require a rigid footing.

Cantilevered retaining walls are made from an internal stem loads (like of steel-reinforced, cast-in-place concrete or mortared masonry (often in the shape of an inverted T).

- These walls cantilever a beam) to a large, structural footing, converting horizontal pressures from behind the wall to vertical pressures on the ground below.
- These walls require rigid concrete footings below seasonal frost depth. This type of wall uses much less material than a traditional gravity walls.

Diaphragm walls are a type of retaining walls that are very stiff and generally watertight. Diaphragm walls are expensive walls, but they save time and space, and hence are used in urban constructions

Sheet Pile retaining walls are usually used in soft soil and tight spaces.

- Sheet pile walls are driven into the ground and are composed of a variety of material including steel, vinyl, aluminum, fiberglass or wood planks. For a quick estimate the

material is usually driven 1/3 above ground, 2/3 below ground, but this may be altered depending on the environment.

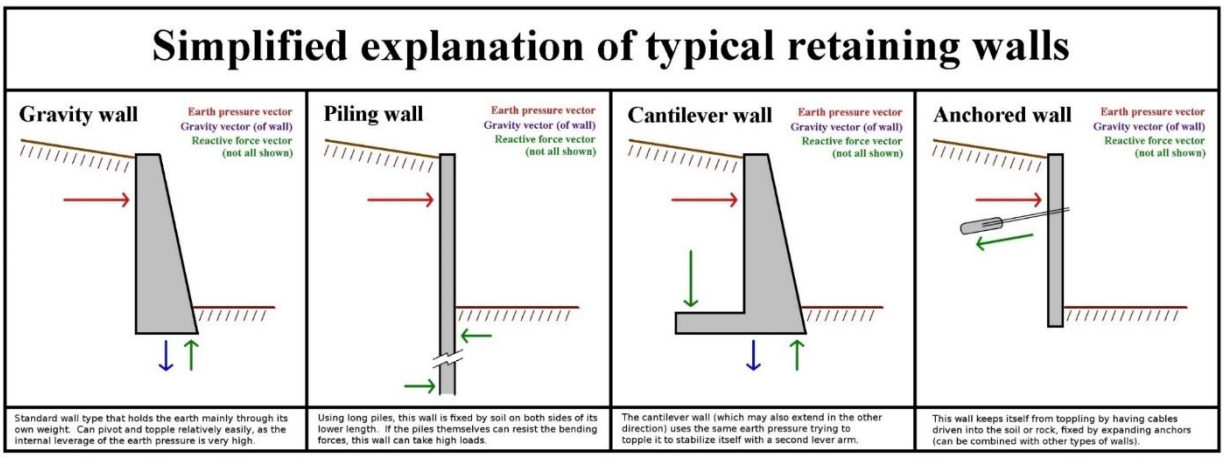
- Taller sheet pile walls will need a tie-back anchor, or "dead-man" placed in the soil a distance behind the face of the wall, that is tied to the wall, usually by a cable or a rod.
- Anchors are then placed behind the potential failure plane in the soil.

Bored pile retaining walls are built by assembling a sequence of bored piles, proceeded by excavating away the excess soil

- Depending on the project, the bored pile retaining wall may include a series of earth anchors, reinforcing beams, soil improvement operations and shotcrete reinforcement layer.
- This construction technique tends to be employed in scenarios where sheet piling is a valid construction solution, but where the vibration or noise levels generated by a pile driver are not acceptable.

An anchored retaining wall can be constructed in any of the aforementioned styles but also includes additional strength using cables or other stays anchored in the rock or soil behind it.

- Usually driven into the material with boring, anchors are then expanded at the end of the cable, either by mechanical means or often by injecting pressurized concrete, which expands to form a bulb in the soil.
- Technically complex, this method is very useful where high loads are expected, or where the wall itself has to be slender and would otherwise be too weak.



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SCHOOL OF BUILDING AND ENVIRONMENT

DEPARTMENT OF ARCHITECTURE

SAR1401 – INTRODUCTION TO LANDSCAPE ARCHITECTURE

UNIT – IV – URBAN LANDSCAPE

Lighting

LANDSCAPE LIGHTING DESIGN is a great way to add beauty, curb appeal and safety to your garden, walkway and entrance areas. Plus, if you have an existing system, it can easily be enhanced or adapted to reflect new layouts, styles, or landscaping updates.

Figure 4.1 The front of this home is beautifully accented by various wall lights and landscape lighting.

Landscape Lighting Techniques

Accent or Spot Lighting

Landscape spotlights focus a controlled intense beam to highlight the focal points in your garden: flowers, small shrubs, and statuary. This creates sparkling islands of interest in your landscape lighting plan.

Grazing

Positioning the light close to an interesting surface can bring out the texture of tree bark, a masonry wall, wood shingles or an attractive door. Grazing of smooth surfaces is not usually recommended.

Shadowing

Light the object from the front and below to project intriguing shadows on the wall or other vertical surfaces.

Silhouetting

When you conceal lights behind and below a tress or bush, you achieve that same wondrous effect as seeing it on a ridge silhouetted against the sky at dusk.

Pool and Fountain Lighting

Underwater lighting creates dramatic effects in pools and at fountains. Install a dimmer for turning lights up to add excitement. Note: Water may be used as a mirror by lighting the area behind the reflecting surface.

Cross Lighting

Illuminating a tree or statue from two or more sides reveals the three-dimensional form in a striking perspective.

Up lighting

Lights aimed upwards (sometimes buried in the ground) create a highly dramatic effect akin to the theater. Use it with interesting trees, a statue or textured wall surfaces. Autumn leaves or swirling snow provide spectacular views. Focus the light on the key plants or objects in your yard.

Spread or Diffused Lighting

Where you require circular patterns of light on flower beds, larger shrubbery or ground cover, spread lights cover a wider area with low-level illumination. Some units, such as these bollards, cast softly diffused lighting for patios, decks, driveways and pathways. Wall brackets provide a similar lighting function. The path or flower bed should be more illuminated than the actual fixture.

Moonlighting

Like down lighting, but using soft light sources positioned very high up, this technique simulates the lovely effect of moonlight filtering through branches, casting attractive shadow patterns.

Down lighting or Area Lighting

Mount lighting units high up in trees or on the house to cast broad illumination over wide areas. Landscape flood lighting enables you to entertain in your backyard or outdoor area after dark, and does double duty for security and safety. For highlighting flower beds, paths or steps, the downlight is positioned close to the ground.

Landscape Lighting Areas

Close-By-House

Illuminating side and rear entries to the house, as well as walls with easy access widows, can discourage prowlers and thieves.

Driveway Lighting

Highlighting your driveway with light also improves safety and security, while the delineation creates an attractive pattern.

Figure 4.2 The landscape lighting in this scene complements the outdoor fountain.

Rear Yard Lighting

Floodlighting from house or trees helps discourage intruders and vandals. Where you can't conceal the light source, select units which look attractive—not industrial. Arrange for automatic timers, photocells or motion sensors.

Front Entry Lighting

Provide a warm welcome after dark. Select a wall bracket which casts adequate illumination on front steps, as well as lighting the keyhole and house numbers.

Steps and Paths

Frequently neglected, but also important to avoid accidents in dark locations, are low path lights, post lanterns and lights attached to the house.

Garage

Ample lighting over the garage will enhance both safety and security, particularly when other lights are not on.

Figure 4.3 Outdoor Path Lights Add to The Look of This Walkway.

TYPES OF LANDSCAPE LIGHTING FIXTURES

Cylinder, Box Shape and Bullet Shape

These designs help focus and direct the light beams. Some also cut off glare and protect the lamp and socket from debris and moisture.

Spread and Diffused

These low-level units are designed to cast illumination in a broader pattern for; flower beds, perimeter plantings, driveways, steps and paths.

In-ground or Well Light

Burying these fixtures flush with the ground conceals the light source. Use for up lighting trees and shrubs, and grazing textured walls.

Spot or Accent

Versatile/adjustable fixtures used for up lighting, cross lighting, accenting and grazing; when mounted high up provide focused down lighting and moonlighting.

Wall Bracket, Ceiling Close-up, Chain Lantern

Mounted at entry doors, over garages and on porches, these chain-hung lantern style units cast light outward—either direct or diffused.

Bollard and Post Lights

These standing fixtures light pathways, steps, garden walks, deck and pool areas. They also provide attractive light patterns for driveways.

Swimming Pool and Fountain Lighting

These fixtures are installed in sides and at ends of swimming pools and bottoms of fountains. Wet niche fixtures can be removed for lamp changes, while dry niche fixtures require access to the back of the pool shell. Colored lighting is popular for this application.

Timers, Transformers and Other Accessories

Automatic timers, photocells, or motion sensors which turn lights on at dusk and off at dawn make landscape lighting convenient and energy saving. See manufacturers catalogs for other accessories which may be required.

Roof Gardens

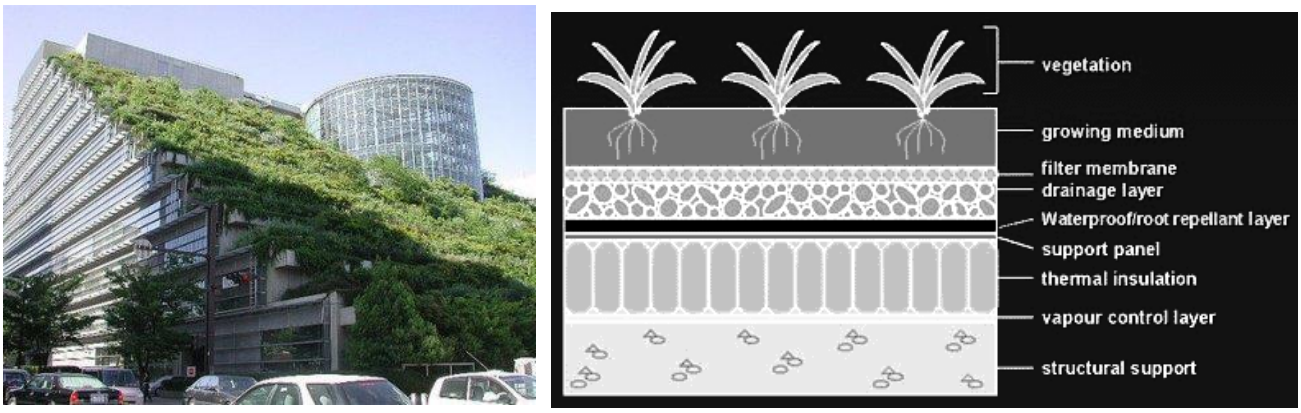


Figure 4.4 Roof gardens

Benefits of Green Roofs:

Green roofs are used to:

• Grow fruits, vegetables, and flowers.

• Reduce heating (by adding mass and thermal resistance value) and cooling (by evaporative cooling) loads on a building — especially if it is glassed in so as to act as a terrarium and passive solar heat reservoir — a concentration of green roofs in an urban area can even reduce the city's average temperatures during the summer.

• Increase roof life span.

• Reduce storm water runoff.

• Filter pollutants and carbon dioxide out of the air.

• The soil and plants on green roofs help to insulate a building for sound; the soil helps to block lower frequencies and the plants block higher frequencies.

• Filter pollutants and heavy metals out of rainwater.

• Increase wildlife habitat in built-up areas.

Disadvantages:

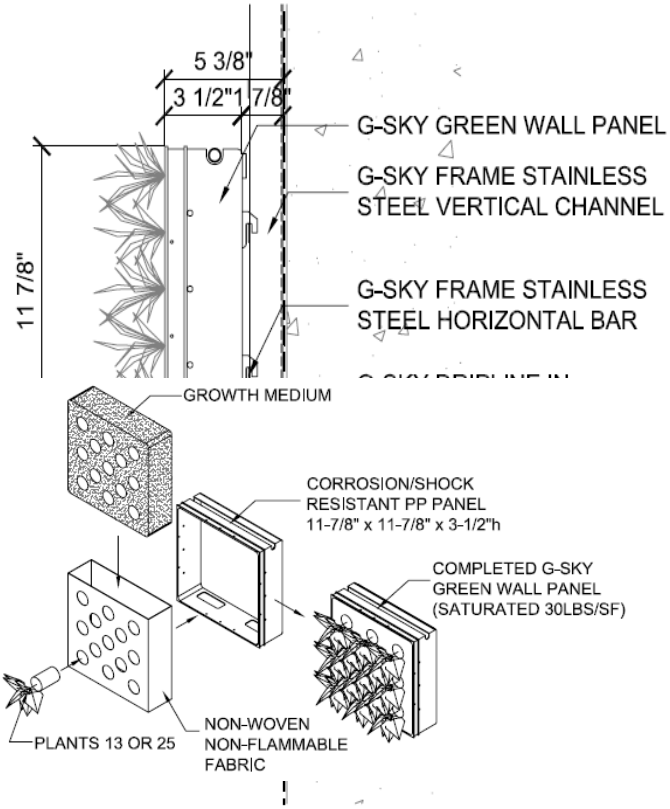
- Green roofs have more demanding structural standards.
- Some existing buildings cannot be retrofitted with a green roof because of the weight load of the soil and vegetation.
- Depending on what kind of roof it is, the maintenance costs could be higher.
- Green roofs also place higher demands on the waterproofing system of the structure both because water is retained on the roof and due to the possibility of roots penetrating the waterproof membrane.
- Installing adequate water proofing systems and root barriers can increase the cost of the roof.

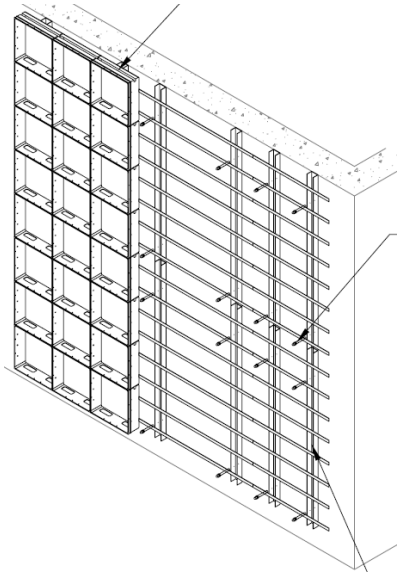
Green Walls

USAGE

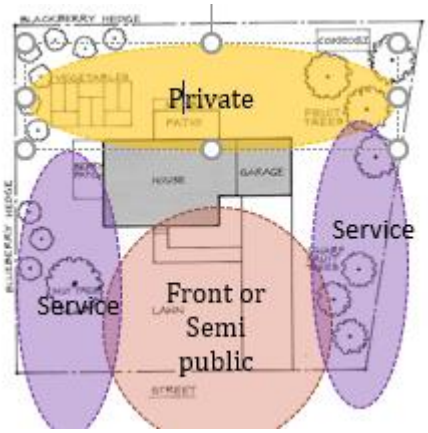
- Reduction of thermal loading to buildings - lower heating and cooling costs = lower carbon emissions
- Reduction of heat island effect - less reflected heat
- Storm water attenuation - panels can absorb over 30kgs per m2 of rainwater
- Air purification - plants are efficient
- Filters of pollution - especially when used indoors

- Noise attenuation - quieter buildings and streets
- Increased urban biomass - more green increases all of the above
- Ecological habitat increased even with non-native plant species
- Positive urban psychology - uplifting effect on those who see it
- Positive upgrade (retrofits) to existing urban fabric





Division of Property into Three Major Areas:



1.Front or Semi-public

- Front of the home.
- Open to the public and serves as foreground for house
- Generally best to develop as open lawn with trees to enframe house front areas.
- Front areas are generally restricted to save space for other areas.

2. Private

- Developed to meet outside recreational activity requirements or desires of family.
- Consists of major portion of property and may include flower gardens, open lawn areas, and outdoor living sections to either side or rear of house
- Generally used related closely to interior private units. It may be developed formally or informally.

3.Service

- Developed in conjunction with kitchen, garage and service units of house.
- Include facilities for servicing house (walks and drives), garbage, drying yard, fuel, storage, poultry yard, dog run, vegetable garden, and/or fruit orchard.
- children's play pen in full view of kitchen windows.

Planting

- Priority in the development of the average landscape:
- A. Establishment of lawn as a conservation measure.
- B. Location and planting of trees.
- C. Base and/or foundation of plantings.
- D. Border and screen plantings.
- E. Refinements of all plantings.

- Shrubs in foundation and border planting should normally be place ½ to 2/3 of their mature height apart.
- Vine and ground-cover type plants may be place closer to house walls.
- The entrance should be kept dominant and the corners should be softened with a plant that matures at 2/3 the height of the corner.
- The appearance of the house can be greatly changed by the skillful use of plant materials.

Color

The purer and stronger the color we introduce into the landscape, whether in plants or structures, the more carefully we must consider its quantity and relation to the other color elements around it.

Landscaping for Children Park

Site Planning for Neighborhood Parks and Tot Lots

- Play spaces, in simple terms, are spaces where children play

- Thus, there is a need for quality outdoor spaces for children, comprises of a number of play opportunities.
- Play opportunities can take the form of Manufactured equipment, naturally occurring opportunities within the landscape, or opportunities for interaction with others.
- It is a well-accepted principle in early childhood education that children learn best through free play and discovery.
- This is hindered in play spaces with play equipment alone

Children's interaction with the environment

openness, diversity	Natural elements provide for open-ended play that emphasize unstructured creative exploration with diverse materials.
	The high levels of complexity and variety nature offers invites longer and more complex play.
exploration	Because of their interactive properties, plants stimulate discovery, dramatic pretend play, and imagination.
	Plants speak to all of the senses, so it's not surprising that children are closely attuned to environments with vegetation. Plants, in a pleasant environment with a mix of sun, shade, color, texture, fragrance, and softness of enclosure also encourage a sense of peacefulness.
manipulation	Plants, together with soil, sand, and water, provide settings that can be manipulated. Eg – building sand castles, trenches etc

Children – Age Wise Category

Based on the developmental levels of children

Toddler - under 3 years

Characteristics

This group enjoy the sensory experiences of play in sand, mud, water and dirt and the manipulation of loose elements from the surroundings such as leaves.

They experiment intensely within their physical ability and receive great benefit from exposure to a variety of stimuli.

Junior - 3 to 5 years

This category is becoming agile climbers and are developing good balance and coordination. Their language skills are developing, therefore enabling more social interaction.

Intermediate - 5 to 7 years

This group is becoming very coordinated and seeks more physical challenge. These children enjoy testing themselves physically.

Senior - 8 to 12 Years

This age group is becoming more independent and may be beginning to attend play spaces with friends and without adult supervision. Physical motion such as spinning, swinging, rocking, climbing and gliding

TYPES OF SPACES

Equipped Playground

Primary purpose of the space is that of a playground and it will have some equipment, or design, that clearly indicates this to be the case

Playing Field

A large area, of flat grass or hard paving, that either has, or is intended to have, sports pitches on it.

Local Park

- A park within an area of housing,
- Essentially for the use of local people
- Local children accompanied with no care taker.

Destination Park

- major town park, or country park,
- special visit
- arrive by car, public transport or cycle, accompanied

Others

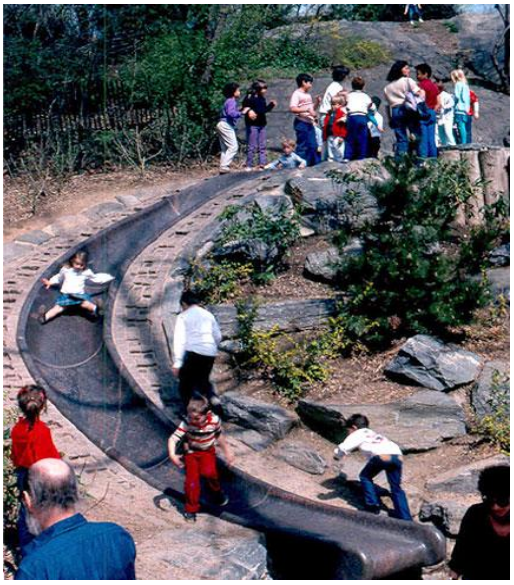
- As made necessary by unique conditions of site and location, EG – Beach, riverside etc
- The character of the play space - defined by planting creates the feel of a small private world which children feel is their own.
- No shade in play space
- Play spaces in apartments and group housing can consist of the following:
- The play space
- It should be focussed less on play equipment and more on spaces for group activities.
- This is because it is a very intensively used space and children like to have variety in their play spaces.
- Tracks for bicycling
- Space for ball games
- Seating areas for elders especially grandparents can be included
- The play space here should be a combination of all kinds of play catering to all age groups.
- The space should be so located that it does not conflict with vehicular circulation and parking.
- This is because in apartments children mostly use the space with little supervision
- Play activity takes place mostly in the evenings
- Play equipment is mostly used by the younger children and the older children prefer group games
- Natural elements - Sand, water, etc
- Manufactured play equipment - Freestanding structures, Composite structures

Developmental objective	Play activity	Play component / equipment required

Physical	climbing, balancing, hanging, running, swinging, and rocking	Manufactured play equipment, Play courts
cognitive	Sensory play	Specialised equipment or natural elements, sand water, vegetation, surfaces with textures
social	Group play Dramatic play	Open space, play props
passive	rest	Open space, seating

Opening up sightlines

- Judicious thinning and pruning of hedges or
- replacing fencing with see-through fencing



Physical Or Active Play:

All kinds of physical movement and motion including climbing, balancing, hanging, running, swinging, and rocking

Cognitive play:

Using the imagination, Ordering, Categorizing and manipulating objects to construct or create, Sensory experience, and Problem solving.

Social Play:

Experiences which involve another child or a group of children, often involving games of the imagination, dramatic role play, rules, and creative or physical activity.

Passive Play

Natural environments represent different play opportunities for children. The rough surface provides movement challenges, and topography and vegetation provide a diversity of different designs for playing and moving.

Things children like in their outdoor environments include:

- Water, vegetation, including trees, bushes, flowers and long grasses, animals, creatures in ponds, and other living things.
- Sand, best if it can be mixed with water, natural color, diversity and change places and features to sit in, on, under, lean against, and provide shelter and shade
- Different levels and nooks and crannies, places that offer privacy and views

- Structures, equipment and materials that can be changed, actually or in their imaginations, including plentiful loose parts.

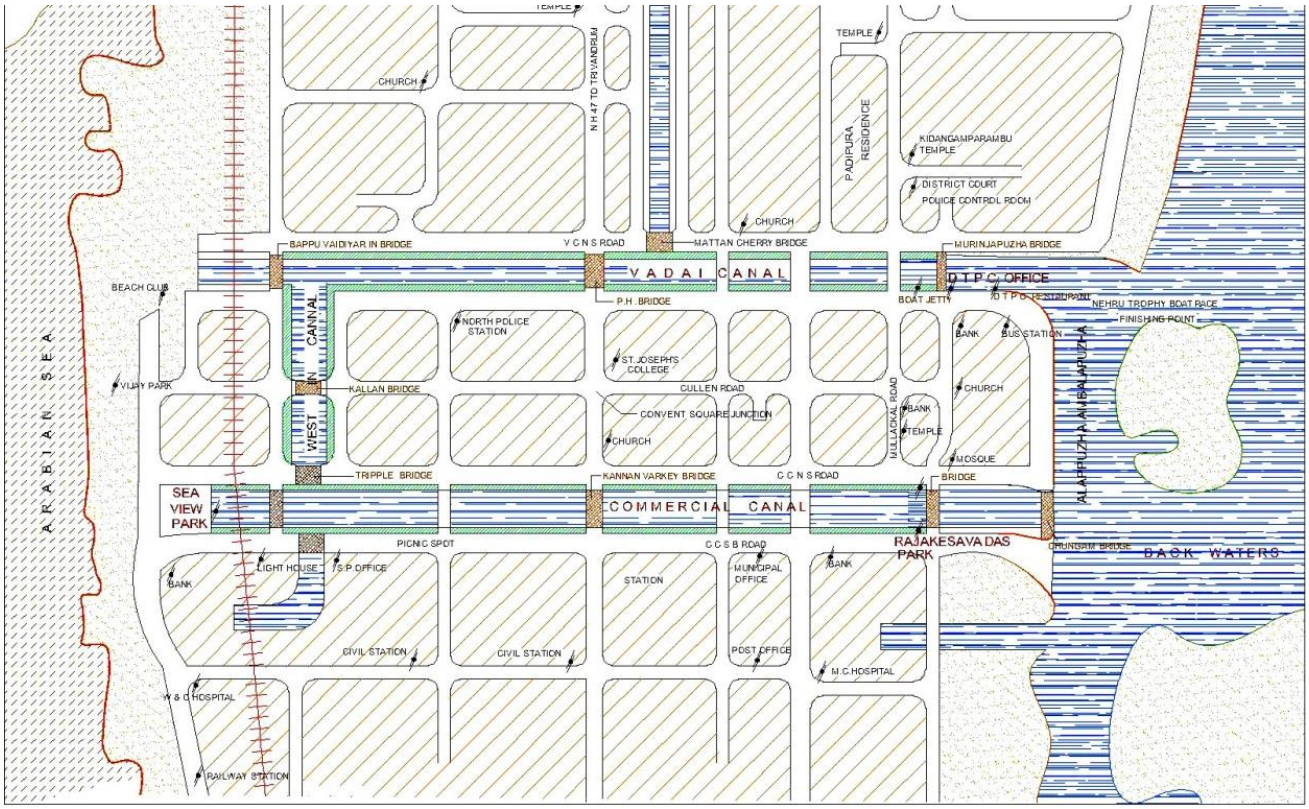
Specification	Specification	Time	Walking Distance	Radial Distance	Minimum size of activity zone / area		**age group**
Housing cluster (500 population)	Door-step spaces and facilities	1.5 min.	100m	60m	100m² - 500m²	< 200m²	Mainly to those under 8 – also to older children
Sector (5000 population)	Local spaces and facilities	5 min	600m	240m	400m² - 3000m²	< 500m²	All age groups
Community (25000)	Neighbourhood spaces and facilities for play	15 min.	1200m	600m	1200m² - 10000m²	< 2000m²	All age groups
District (5,00,000)	District play space	30 min	6000m	4 km	5 – 12 ha		
City (>5000000)	Large district public open space		12km	8 km	12 – 20 ha		

Landscaping For Water Front Areas

The town of Alleppey has a network of canals included in the west coast canal system which are used for navigation. The important canals are vadai canal and commercial canals and the link canal between these two canals.

The back water system and their adjoining areas are subjected to seasonal flooding and are utilized as filtration ponds for aquaculture and pokkali (salt resistant variety of paddy).

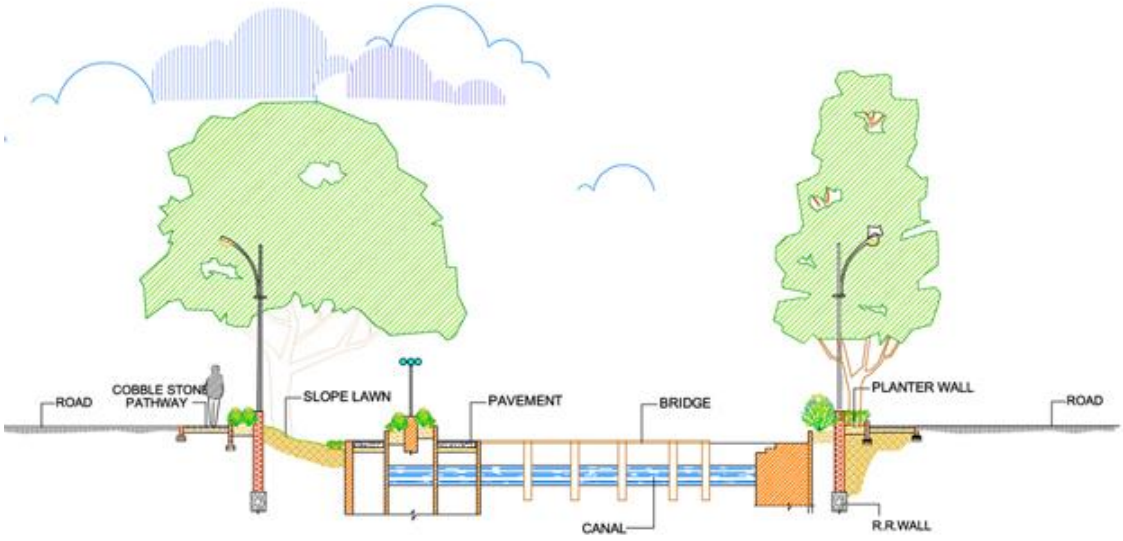
- The canals were desilted & re-connected to the sea to revive the natural flushing of



waters due to tidal activity.

- Sewage & wastes flowing into the canals was curtailed.
- Banks were stabilized to clearly define the canals.
- Tracts of land along the water, was identified as possible green recreation zones. These areas varied from 15m to barely a few feet in width.
- Walking trails were identified at various levels & were evolved in a way so as to retain the existing trees.

- Steps or "*padithurais"*were designed to connect all horizontal planes.
- Play spaces & other recreational zones were conceived along the stretch.
- Seating's & view-points were devised as both static & dynamic spaces to enhance the landscape design.
- A revised lighting scheme was formulated so as to avoid dark spots and thus prevent anti-social activities.
- Vernacular style of architecture was followed in all structures used in the landscape design.
- Retain existing vegetative cover as much as possible.
- An urban landscape plan was formulated keeping in mind the street furniture, hoardings, imagery of the site.



- A suitable maintenance strategy was also thought of, so as to make the project self-sustaining.

Design Principles

- Connecting people to river physically
- Drawing line of sight to river
- Creating coherence using landscaping
- Encouraging activities along river recreation, housing, commerce and retail.
- Creating a sense of place.
- Provide promenades along the waterfront and avoid incompatible land uses. Sites along the waterfront should be reserved for cultural, tourism-related, recreational and retail activities.
- Avoid the "Wall" effect and create a varying building height profile where appropriate. Taller developments should be located inland, with lower developments on the waterfront. In new developed areas, these considerations should be given.
- Create an active waterfront with diversity in activities and functions including restaurants, retail facilities, promenades and piers. Add well designed landscaping and street furniture where appropriate.
- Encourage diversity in building mass to avoid a monotonous image. The massing should create points of interests and nodes.


Flower garden
Parking
Flower garden
Tea house
Service building
Flower garden
Cycle Path
Aquatic plants
Pavilion of Wolftail Grass
Cycle Path
Red ribbon
Board walk
Red ribbon
Pavilion of Mayflower
Aquatic plants
Pavilion of Reed
Long bench
Red ribbon
Pavillion of Silvergrass
Cycle Path
Long bench
N
The Red Ribbon: Tanghe River Park