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15 marks - Part B also 5 marks in Part A.

Site Analysis and Site Planning

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The success of development can be judged by the quality of the relationship between the building, the site, and surroundings. The quality of the designer's response to the site determines the quality of architecture, and is a function of:

- how much is known about the site;
- how well the site is understood; and
- how well what is known and understood has been used.

Basically what we need to know about the site, or the land upon which development is going to take place can be summarised as follows:

- What happens on the land, e.g. topography, vegetation etc:
- What happens under the ground, e.g. geology, water table etc;
- What happens around the site, e.g. visual and other links with surroundings, access etc.

These factors impart to the site its uniqueness, its distinctive character.

How the site is used is dependent on the basis adopted for attributing value or priorities to the characteristic of the site.

Economic - is the land seen as a commodity, i.e. a piece of real estate to be developed purely for short-term financial gain?

Ecological - is the land seen as a resource, whose environmental qualities can be beneficially exploited without disrupting its inherent characteristics.

Aesthetic - is the land appreciated purely as a visual picture, much like a stage setting?

Arbitrary - is the land seen merely as two dimensional area demarcated by boundaries?

Obviously, any site on which development takes place has to be looked at in all of the above ways. The client/architect must judge which factors deserve priority depending on the particular situation. For example, in a city centre site with astronomical land values it is inevitable that land is seen as a commodity.

Site appreciation and analysis can be carried out in either of the following two situations:

(i) Where the proposed use of the site is predetermined, and site analysis and site planning are concerned with determining, how best the proposed use can be fitted to the site.

(ii) In particularly large scale regional situations site appreciation and analysis may be carried out to determine what the land is best suited for.

Whereas the first type of situation relates to the architectural scale (e.g. site planning of housing, campuses etc.), the second is concerned with decisions at the town planning and landscape planning scale.

Whenever a site is to be developed for a particular building programme, two sets of factors have to be considered.

SITE FACTORS - those relating to the characteristics of the site

USE FACTORS - those relating to the proposed use of the site, i.e. the building programme.

The study and understanding of the site factors constitutes site analysis.

The site planning process involves the fitting of particular characteristics of the site. To do this, site factors can be related to use factors by analytical techniques such as sieve or matrix.

The objectives of site planning are two-fold: firstly, to

plan development so that the siting of building is determined as far as possible by the above mentioned site factors, and secondly, to make optimum use of the site by placing building in such a way that open space is complementary to the built space and serves necessary outdoor functions in the most appropriate locations. *The space between building must be made into a positive element in itself.*

Site Factors

Site factors can be listed as follows:

Topography	Access
Vegetation	Surrounding
Microclimate	Visual
Hydrology	Historical
Geology	Drainage
	Soils

All factors may not be relevant in all situations. The list should serve as a checklist. Site analysis is directed towards:

- Identifying what factors out of these contribute most of the distinctive character of the site;
- Anticipating the specific consequences of change or development on the site.

The consequences may be unacceptable in aesthetic, ecological or economic terms depending on our outlook. For instance, the disturbance of a skyline may be visually unacceptable. Blockage of a natural drainage channel may necessitate the provision of expensive and, therefore, economically unacceptable alterative drains. On the other hand, the blocking of the natural drain may make a larger area of land available for building, measured against the value of which the cost of providing an alternative drainage system may be negligible.

Or, in the above example we may wish to preserve the natural drainage channel because it is ecologically important in the regional context, it has aesthetic value, it imparts distinctive character to the site...etc.

Site analysis should help in deciding what must be preserved and what can be changed; it should aid site planning decisions such as:

- Identification of areas suitable for building;
- Identification of characteristicsites which are to be preserved and which can be exploited in the future use of the land;
- Location of building to articulate space within the site;
- Location of various uses within the site, eg. parking, service areas, recreation zones, etc; and
- The integration of what is preserved with what is proposed.

Good site planning attempts to emphasize and exploit the characteristics of the site, this may strengthen the identity of the site and impart to it a sense of place, the historical continuity between what has gone before on the site and what is proposed

The analysis of site factors should indicate how the landscape characteristics of the site will affect building development and vice-versa. Distinctions may be made between those factors which are within the site (on site) and those which are outside the site (off site) but still affect development on the site.

The landscape affects, and is affected by development. The kinds of analysis necessary for understanding how this happens are indicated below.

Topography

Topography and slopes on a site are a very important determinant of how land can be used. Topography also affects micro-climate and surface drainage.

One way of making topographical information directly applicable to site planning is by slope analysis. Different categories of slopes from steep to gradual are identified on a contour plan. If the categorisation is carried out bearing in mind what kinds of slope are suitable for building, then a pattern indicating land which can be built upon will emerge.

The topography of an area determines also the aspect of various slopes.i.e., North-facing slopes, south-facing slopes etc. In temperate or cold climates south-facing slopes are preferred for development as they receive more sunlight than north-facing slopes.

The system of ridges and valleys formed by the topography of an area determines the drainage pattern of storm water. Major drainage channels should not be interfered with the better areas for development are generally where the drainage is dispersed: i.e. the water flows from a small area and spread over a larger area, rather than those areas where drainage is convergent i.e., flowing from a large area to a small area. The steepness of slopes, together with soil characteristics and vegetation cover also determine the susceptibility of the land to erosion.

The slope analysis read in conjuction with vegetation analysis will indicate generally those areas where it would be unwise to remove existing vegetation, as this would lead to erosion. These areas would not be suitable for building development.

Topography also affect the visual impact future development is likely to make. The ridge lines on a contour plan mark the natural skyline of the site. The fact that any development on these ridges would change the skyline has to be borne in mind while siting building.

Vegetation

Existing vegetation on a site fulfills various functions:

- It protects soil from erosion;
- Decaying leaves provide humun and improve soil;
- Trees and shrubs protect site from dustladen winds;
- Vegetation releases moisture to the air and thus modifies microclimate;
- Trees provide a habitat for small animals and birds;
- Trees and shrubs reduce amount of direct sunlight reaching ground;
- Plants photosynthesise, releasing oxygen and absorbing carbon dioxide from the air.

The desirability of retaining existing mature vegetation on a site is self-evident: this vegetation influences considerably environmental conditions within the site. To take effective account of existing vegetation it is necessary to carry out a vegetation survey. For this purpose vegetation on the site may be classified into three categories:

1. The top layer, that is, the tree cover. Each tree needs to be identified with regard to species, height and spread and condition.
2. The middle layer, or shrubs. It may not be necessary to locate each shurb on a plan: zone of similar types of shrub vegetation may be marked.
3. The lowest layer, that is, ground cover. A full ecological study of plant communities must take into account. Such a study is rarely done on urban and artificially maintained.

Classification of zones of vegetation according to density of sparseness when demarcated on a plan is also useful in determining future development of the site. Existing vegetation gives significant clues about soil conditions within the site.

Assessment of vegetation on a site can take the form of recommendations:

1. Essential - to be kept at all cost.
2. Desirable - to be kept unless retention renders the project unworkable.
3. Inessential - may be kept or not, as planning requirements dictate.
4. Undesirable - should be removed because of disease, danger etc.

Transferred to a drawing, this assessment in conjunction with other factors will indicate a pattern showing the desirability or otherwise of development in specific zones in the site.

The existing vegetation on a site determines to a large extent its visual character. The pattern of vegetation may result from natural factors as in the case of sites in undisturbed areas, or it may result from human activity as for instance in agricultural areas with tree planting on the field boundaries. It is essential to recognise the pattern formed by vegetation so as to attempt to preserve a continuity between what has gone before (on the site) and what is to come.

Drainage

Development of a site affects the local drainage pattern of the area within the site is located. Development is usually accompanied by an increase in the non-porous surface (e.g. roads, paving, roofs, etc.) and storm-water run off is therefore increased.

As already mentioned surface drainage is very closely related to topography. The identification of ridges and valleys gives some indication of the drainage pattern, such as catchment areas, major drainage channels, areas of poor drainage, areas susceptible to erosion.

Major water courses would generally exist in areas which receive water from a number of catchment areas and smaller channels. They would be part of the local natural drainage system and their precise function needs to be recognised before any proposals for their alteration are made. In fact, these drainage zones may sometimes be of such significance that they cannot be interfered with at all and their position would dictate the pattern of building development. In any case, it would be very unwise to site buildings either directly in the line of major drainage or in low lying areas.

6th Sem. B-Arch 2017 (15 marks)
Importance of Drainage.

Low-lying areas and areas with levels which do not permit the flow of water would suffer from poor drainage and would at times become waterlogged. The identification of these areas would indicate how the levels of the land need to be altered so as to improve drainage; it would also show which areas are most suitable for the siting of buildings from this point of view. Areas of steeper slopes with little vegetation would be the most prone to soil erosion. They would of course be usually unsuitable for building; but measures to control and prevent erosion in these areas would also be part of the site development programme.

Geology/Soils

Apart from the engineering classification of the soil with regard to its bearing capacity, in landscape work it is necessary to classify soil according to biological qualities. If the site is very large, soil conditions may vary; a detailed analysis would help in making an effective planting programme related to particular solid condition in various parts of the site. Also, the nature of the soil (sandy, etc.) determines to some extent, whether it is succepitible to erosion by wind or water, and preventive measures to counter soil erosion can be taken, as part of the landscape development plan.

Micro-climate

Microclimate refers to precise conditions within a single site. On undeveloped sites it is the result of the inter-action of natural factors such as vegetation, topography and water. As already explained, these affect the humidity, amount of sunlight received on the site, degree of shelter from hot or cold winds.

Removal of or changes in any of these existing elements on the site would obviously bring about changes in the microclimate. It should be possible to assess through site analysis the exact contribution of any of these elements to the microclimate of the area and whether this contribution is significant or not. The value of these elements from this point of view can thus be assessed and this will indicate how they can be used to full advantage in the siting of building. If the microclimate of an area displays negative qualities; e.g. for instance, the site may be exposed to strong winds, or the lack of vegetation on the site may result in great amount of heat radiation; then the recognition of these aspects would point the way towards proposing remedial measures in the landscape plan.

Visual Analysis

A visual record of the site is essential if intention is to exploit spatial qualities. It should include analysis of the character of the space and relationships between them.

It is important also to consider the visual relationship between the site and its surroundings. How is the landscape of the site perceived from vantage points outside it? What views are there of the surrounding landscape from the site itself? The answers to these questions would have considerable bearing on how the site should be developed. For instance, in a site with undulating topography, the ridges would form the skyline. If this skyline is quite prominent, then development of buildings upon these ridges would have a very significant visual impact and the implications have to be understood before buildings are so located.

The above factors have to be studied with regard to their interaction, so as to understand how they would be affected if changes were made to one of the following;

Climate/Slope

Slope/Drainage

Soil/Slope

Vegetation/Climate

Visual/Slope/Topography

Visual/Vegetation

Other factors which must also be taken into account are:

- Access
- Services & Utility lines
- Surrounding land use: its impact on the site
- Features such as old walls, historical structures, boulder formations etc. within the site.

All the data on the above aspects can be synthesised into a form applicable to site planning by means of an overlay technique. This progressively indicates the constraints and opportunities for development arising out of each of the above mentioned factors. The final stage of site appraisal is a process of synthesising the data on the nature of the intended project into an appreciation of the site as a total entity; it should lead to conclusions on the suitability of the site for its purpose and on its landscape potential.