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景觀設計綠皮書

鋪裝 · 水景 · 綠化

CHINA FORESTRY PUBLISHING HOUSE
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GREEN BOOK OF LANDSCAPE DESIGN

——Pavement · Waterscape · Greening

景觀設計綠皮書——鋪裝 · 水景 · 綠化

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PREFACE

GREEN BOOK OF LANDSCAPE DESIGN AIMS TO PROVIDE NEW CONCEPTS OF LANDSCAPE DESIGN IN AN ALL-AROUND WAY, AND TO DEMONSTRATE LANDSCAPE DESIGN CASES AND MASTERPIECES RICH IN WIT AND WISDOM OF THE DESIGNERS ALL OVER THE WORLD. THE BOOK IS INTRODUCED BY MEANS OF THE FOLLOWING TWO CLUES: ONE STARTS FROM THE LEVEL OF THEORETIC KNOWLEDGE TO INTRODUCE ENVIRONMENTAL ART, LANDSCAPE AND LANDSCAPE CREATION, FEATURES AND KEY POINTS OF ENVIRONMENTAL COMPOSITION, FUNDAMENTAL RULES OF LANDSCAPE DESIGN AS WELL AS FORMAL STRUCTURE AND FUNCTIONAL STRUCTURE OF ENVIRONMENTAL FACILITIES; THE OTHER IS THE FOCAL POINT OF THE BOOK, WHICH PROVIDES ABUNDANT CLASSIFIED PICTURES AND SHOWS FANTASTIC LANDSCAPE EFFECT.

THE BOOK FEATURES REMARKABLY A HUGE NUMBER OF LANDSCAPE PICTURES BOTH AT HOME AND ABROAD. ABOUT 5,500 PICTURES DISPLAY REALISTIC LANDSCAPE PICTURES DIVIDED INTO 32 ITEMS OF 7 CATEGORIES, TO BE SPECIFIED AS FOLLOWS: OVERALL VIEW (INCLUDING PUBLIC SPACE AND RESIDENTIAL SPACE); SQUARES (INCLUDING PUBLIC SQUARES AND RESIDENTIAL SQUARES), PAVEMENT (INCLUDING SQUARE PAVEMENT, THE PAVEMENT OF ROAD SURFACE, STEPS, WATERSIDE PLATS, ETC); WATERSCAPE (INCLUDING WATER POOL, FOUNTAIN, WATERFALL, WATER-DROP, STREAMS, SWIMMING POOL, GREENING ON WATER SURFACE, ETC); GREENING (INCLUDING FOREST, FORMULA GRASSPLOT, SHRUBS ETC); ARCHITECTURE ARTICLES (INCLUDING THE ENTRANCE, FENCE, BRIDGE, PAVILION, CORRIDOR AND STAND, ETC); LANDSCAPE SKETCH (INCLUDING RAILS, WATERWHEEL, SEATS, LAMP, SMALL AMUSEMENT PARK, FLOWERS, THE WATER-DROPPING SLOTS OF FOUNTAINS AND SCULPTURES, ETC).

TO FACILITATE THE USE OF READERS, GREEN BOOK OF LANDSCAPE DESIGN IS PUBLISHED IN THREE COPIES: GREEN BOOK OF LANDSCAPE DESIGN—PUBLIC SPACE·SQUARES, GREEN BOOK OF LANDSCAPE DESIGN—PAVEMENT·WATERSCAPE·GREENING AND GREEN BOOK OF LANDSCAPE DESIGN—ARCHITECTURE ARTICLES·LANDSCAPE SKETCH, ETC. EACH BOOK IS ALSO VERY CONVENIENT TO USE, IN WHICH RELEVANT INFORMATION IS EASY TO CONSULT BY REFERRING TO THE GENERAL CATALOGUE OF THE BOOK AND THE SUBDIRECTORY OF EVERY SECTION OF THE BOOK. IT IS WORTH MENTIONING THAT THE PAGE NUMBER ON THE SUBDIRECTORY SHOULD BE GOVERNED BY THE ACTUALLY CORRESPONDING PAGE NUMBER INSIDE THE BOOK.

THREE COPIES OF GREEN BOOK OF LANDSCAPE DESIGN ARE FURNISHED WITH A SET OF CD ABOUT PICTURE MATERIALS FOR ALL THE COPIES.

前言

《景觀設計綠皮書》的編寫旨在為景觀與園林設計師和工程師全方位地提供景觀設計的新的理念和世界各地設計師們充滿智慧的景觀設計案例和作品。全書分為兩條線索來介紹：一條線索是從理論知識的層面，介紹了環境藝術、景與造景、環境構圖的特點和基本要點、景觀設計的基本規律、環境設施的形態構成和功能構成。第二條線索是本書的重點，分門別類地提供了豐富的圖片資料，展示出美不勝收的景觀效果。

《景觀設計綠皮書》突出的特點是涵蓋大量國內外景觀圖片信息。以近 5500 幅圖片，展示出 7 大類 32 項的國內外景觀實景圖。包括：整體景觀（包括公共空間、住宅空間）、廣場（包括公共廣場、住區廣場）、鋪裝（包括廣場鋪裝、路面鋪裝、臺階、汀步等）、水景（包括水池、噴泉、瀑布、跌水、溪澗、游泳池、水面綠化等）、綠化（包括樹林、幾何草地、灌木等）、建築小品（包括入口大門、圍牆、橋、亭、廊架等）、景觀小品（包括欄杆、水車、座椅、燈、小型游樂場、花壇、噴泉的落水口、雕塑等）。

為了便于讀者使用，《景觀設計綠皮書》分為三冊出版：《景觀設計綠皮書——公共空間·廣場》、《景觀設計綠皮書——鋪裝·水景·綠化》和《景觀設計綠皮書——建築小品和景觀小品》等。每本書的使用也很方便，可根據本冊的目錄、總目錄及每部分的子目錄來查找相關的信息。需要說明的是，子目錄的頁碼是以相應圖片所在的頁碼為準。

《景觀設計綠皮書》三冊配有全部圖書中的圖片素材光盤一套。

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Environment Facilities

環境設施

I. Shape Composition

The shape composition of environment facilities is the comprehensive characteristics demonstrated by the external and internal structure of the facilities. It is divided into three aspects of the external composition (relationship), image (token) and meaning (characteristics). The British philosopher P. Colossi decomposed the formal relationship and pointed out that "there are two types of formal relationships: the formal relationship of fundamental structure and the formal relationship of upper structure. The former refers to the relation of the basic unit of the phenomenon constructions while the latter refers to the structural layer on the basis of the former." Then a brief introduction will be made concerning the ternary relationship.

A. Token (image) is the first visual effect upon the audience by the environment facilities. It is through the token that the characteristics can be exposed by the external composition and meaning of the facilities. It usually has the basic unit of single buildings and uses the serviceable property as the first characteristics.

B. Relationship (external composition) is the combination method of the shape, group organization and other environment elements of environment facilities.

C. Characteristics (meaning) are a comprehensive expression of the attached functions, the fine parts of the environment facilities and their combination in the aspects of spiritual and cultural values. Only after second thought and deep appreciation can its profound content be sensed.

All in all, the shape of the environment facilities is a means of cultural expression, except the original meaning of its function. We can trace the cultural origin back to the spectacle and magnificence enjoyed by the ancient Romans, to the quietness and carefulness pursued by the Greeks, to the mystery and profoundness loved by the Indians, to the simplicity and elegance favored by the Japanese, and to the grade and symmetry appreciated by the Chinese. Nowadays, though due to technical improvement, conceptual innovation, further exchange and accelerating information, some queer trends of environment facilities occur in the urban landscape while keeping pace with the world trend, the environment facilities deeply thought and well designed can still reflect the environmental, local or ethical features. And its shape is still the expression of its unique temperament.

II. Functional Composition

When it comes to the function of the environment facilities, people used to simply classify it into two types: practical or impractical, namely decorative. In recent years, they have come to combine practice with beauty, but still lack much consideration for the framework of the function of the environment facilities. Here it is necessary to list the following examples.

The functional compositions of environment facilities consist of the four items: utility, environment image, decoration and auxiliary functions. They distinguish from and connect with each other.

A. Utility consists in facilities and offers directly services and information that are convenient, safety protective. It is the appreciable and extrinsic function of environmental facility, so it is the first function. For example, the main function of the guard posts in the urban plazas is to avoid activities disturbing people; the main function of street lamps is to lighten the streets at night to assure the safety of vehicles and passersby.

B. Environmental images · Environmental facilities complement and strengthen environment by forms, quantity and spatial allocation etc. For example, the guard posts and street lamps must combine all the functional components and form ranks or groups to divide the traffic space and guide the directions for vehicles and passersby. All the functions of environmental facilities are secondary. They are strengthened by the configuration and the reciprocity with specific environments.

C. Decoration refers to the contrast and beautification of environmental facilities on the environment. It includes: (1) the simple artistic treatment; (2) Response to the features of environment and romance to the ambience. The guard posts and street lamps are manufactured with refined materials and moderate scale. But when they are put in a certain district, they must reflect the features of the environment and system of facility. Generally decoration is the third function of the environmental facilities, whereas, for some environmental facilities as streetscape or for fun, it is the first function.

D. Subsidiary functions · Environmental facilities have several functions. For example, hanging fingerposts, flags, signal lamps and flowers on the lamp-standard etc, or the street containing road signs has guiding function. At some places, people use guard posts as stone steels for rest,

and street lamps for lighting, or use weird stones for beautifying environment as guard posts, then complicate the functions of facilities, and purify and emphasize the environment.

The orders of the four functions of environmental facilities often change according to the positions and scenery, for example, the decorations such as the urban sculptures, parterres, pools etc in urban plazas or parks have the first function. If they are change to another position or place, their environmental image and secondary functions may become less important.

Furthermore, the functions of environmental facilities can be displayed by certain specific means. To begin with, let's discuss one of the first manifestations: controlling, the way of restricting and guiding human behaviors and mentality. It can be further explained at following aspects:

(1) Obstruction, namely, positively confining the pedestrians and vehicles with the aid of specialized facilities, such as solid walls, moats, traffic enclosures. In terms of the building materials of the obstructive facilities, the height, degree of succession and frequency of crossing, obstruction falls into three levels. (1) Hard and fast obstruction, which is usually made of hard materials (concrete, bricks, stones, metals etc.) and can resist any rude and careless use. Moreover, some facilities with considerable height or width, such as solid walls, parapets, gutters (1.5m wide and 1m deep) and retaining walls can absolutely prevent the passersby from crossing or striding over under normal circumstances. (2) Semi-hard obstruction, which is formed by using hard materials or soft materials (trees, ropes and curtains etc.) and allow the pedestrians to cross or leap over. This kind of facilities bears weak compulsion, mainly act as dividing lines. Such as the green fences, walls, bollards, gutters (less than 1.5m wide and 1m deep), parapets (less than 1.2m high). (3) dissuasion and warning, which by themselves don't affect crossing of the passersby, but create difficulties by applying special materials on road surface or employing the alternation of the road height. The traffic lines on road, special colors (e.g. yellow), notices can all be applicable in stopping pedestrians and vehicles from crossing. The rugged or lined road surface, warning or dissuading signs.

In the areas with strong restriction, these three above-mentioned obstructions can be used simultaneously to achieve stronger obstructive effect.

(2) Guidance refers to guiding passersby (or vehicles) to forward along the appointed route (direction) with images or spatial signs. We achieve the guidance main by spatial sign features related to roads, milestone and borders of areas. For example, (i.e. tree and current etc.) and the

special treatment of continuity color, height and shape. All the environmental facilities have this kind of capacity. But only when associated with urban landscape, Can they play powerful role.

(3) Division Emphasize different areas with special quality or function by spatial division in urban environment or urban areas, which cannot restrict traffic but is a cue or illumination. For example, the special pavement of the surfaces divides the area into different areas of activity by different colors, texture of materials, and height of terraces.

(4) Shelter refers to shelter some parts of the urban environment or spaces by setting some facilities. It is more compulsive than the division. Shelter has four purposes: ① gain quiet and private environment in the public activity space or noise occasions. Adopt partial treatment such as hedge and segment wall etc to reduce the interference of pedestrian flow or noise. we can find some quiet environment in the enclosed the submerged courtyard (plaza). ② Reduce the interference of the thru-traffic. We can set green belt or some environmental facilities (i.e. billboards, waiting porches) to shelter, or set sound barriers in some special areas such residential areas, hospitals, schools etc). ③ Improve the microclimate of site. The main means are treatments of buildings and landscape. Meanwhile, we can apply some sheltering facility (walls, segment wall and gallery), to attain the purpose that sunshades and lower the temperature in summer as well as shield the wind and preserve heat in winter so that we can get comfortable. ④ We have to hide some defects or remain some scenery in landscape design to increase the environmental neatness and hierarchy of spaces.

Adopt forcible sheltering method to shelter the damaged spots or inelegant scenery; Adopt some original sheltering to shelter some scenic spots, which maybe better than the effects of forcible sheltering.

The other kind of expression mode of functional forms in environmental facility is intermediary of heterogeneous spaces. It can balance the sense of sight and mentality of visitors and inspire the vitality of different environments.

There are complex and ambivalent elements everywhere in the spatial environment where man exists. They take in some phenomena such as closed-open, repressive-free, reason-sensibility, dynamic-static, entity-virtual, endocentric-extroverse etc. The coexistence of the various binary phenomena reveals the complex emotion of mankind. Their similarities and differences stem from western philosophical ideas, is the clue of searching local individual culture and represented in some traditional buildings and environmental facility.

Environment Facilities

環境設施

一、形態構成

環境設施的形態構成是設施外形與內在結構顯示出來的綜合特征。它分成外構（關係）、形象（表征）和內涵（性質）三個方面。英國哲學家P·克勞瑟對形式關係進行過分解，指出：“形式關係有兩種：基礎結構形式關係和上層結構形式關係。前者指現象構造物的基本單位的關係，后者指建築物在前者之上的結構層次。”下面將這三重關係分別做以下簡述。

1. 表征（形象） 環境設施予以人的第一視覺效果，是設施的外構與內涵通過形象表露出的特征，通常是以單體為基本單位，以使用性質為第一特征。

2. 關係（外構） 環境設施造型、組群及與其他環境要素的結合方式。

3. 性質（內涵） 環境設施的附屬功能。細部以及前兩要素的結合在精神與文化價值方面的綜合體現，是須經人的思考和體味才能感悟的深層內容。

環境設施的形態除去其功能的本義外，歸根結底是一種文化的表現形式。我們從古代羅馬人崇尚的莊重偉大，希臘人追求的恬靜嚴謹，印度人稱道的神秘幽玄，日本人喜愛的淡泊素雅，中國人講究的等級對稱等都可以探尋其文化的淵源。今天，盡管由于科技的進步、觀念的變革、交流的深入和信息的速增，環境設施在城市景觀中呈現出光怪陸離且世界同一的雙向趨勢，但是思考充分且設計良好的環境設施，仍然有力地反映環境以及地方或民族的特點，其形態仍然顯示其獨特氣質。

二、功能構成

談到環境設施的功能，人們過去常常把它簡單分解成實用、非實用即裝飾兩類。近年來才開始注意到把實用與美觀結合起來，但是與環境設施功能構成的框架相對照仍有許多欠慮之處，有必要在此做如下列舉。

環境設施的功能構成包括四項：功用、環境意象、裝飾和附屬功能。它們彼此區別、相互結合。

1. 功用 存在于設施自身，直接向人們提供使用便捷、防護安全的服務及情報信息等。它是環境設施外在的，首先為人感知的功能，因此也是第一功能。比如城市廣場周圍的護柱，其主要功能是攔阻車輛進入，免于干擾人的活動；路燈的主要用途是在夜間照明街路，以保證車輛行人安全通過。

2. 環境意象 環境設施通過其形態、數量、空間布置方式等對環境要求予以補充和強化。再以護柱和路燈為例，它們本身就是必須通過組合共同發揮作用的元件設施，以行列或組群的形式出現，對車輛和行人的交通空間進行分割及對運行方向起引導作用。環境設施的這些功能是第二位的，它們往往通過自身的形態構成加之與特定的場所環境的相互作用而強化出來。

3. 裝飾 環境設施以其形態對環境所起到的襯托和美化作用。它包括兩個層面：（1）單純的藝術處理；（2）與環境特點的呼應和對環境氛圍的渲染。護柱和路燈在批量生產中盡管可以做到材料精緻、尺度適中，但是放到某一特定的街區，它們還需具有反映這一環境特點或設施系統的個性。一般來說裝飾是環境設施的第三功能，然而對某些以街道景觀或獨立觀賞為主要目的的環境設施則又是第一位的。

4. 附屬功能 環境設施同時將幾種使用功能集于一身。比如在路燈柱上懸掛指路牌、旗幟、信號燈、盆花等，或者路燈本身就含有路標，兼具指示引導功能。有的地方在特定的場合還把護柱做成可以休息的石凳和照明的路燈，或搬出幾塊美化環境的怪石用作護柱，從而使單純的設施功能增加了復雜的意味，對環境起到淨化和突出作用。

環境設施的以上四種功能的順序常常因物因地而异，如在城市廣場或公

園中，城市雕塑、花壇、水池等其裝飾處于首位；而在同一地點僅變換一種位置，或轉到另外一種場合，它們的環境意象和某種附屬功能則可能反次為主。

此外，環境設施的功能構成往往通過某種具體方式表現出來。我們先談第一種表現方式——控制，即對人的行為與心理的規限和引導。它又包括以下幾方面。

（1）攔阻 對行人車輛的運行加以積極的規限。此目的須借助專用設施加以完成，如牆垣、溝壑、交通圍欄等。根據攔阻設施的材料、高度、連續程度和穿行比率，可將攔阻分成三個層次：①硬性攔阻——通常用硬質材料（水泥、磚石、金屬等）制作，有抵禦粗暴使用的能力；此外，有相當高度或寬度的某些設施也屬硬性阻攔，它使人在正常情況下無法穿行或跨越，比如實牆、圍欄、排水溝（1.5m寬、1m深以上）、牆等。②半硬性攔阻——用硬質材料或軟質材料（樹木、繩索、幔布等）制成，人可以穿行或跨越。這種攔阻設施的強制性較弱，主要起着規限的作用，如綠籬、垣牆、護柱、排水溝（1.5m寬、1m深以內）、圍欄（1.2m高度以下）等。③勸阻、警告——設施本身不妨礙人和車輛的穿行，但通過地坪材質、高度的變化使運行發生困難，或通過劃線或專用色彩（如黃色）、文字告示等阻止人車的逾越，比如凹凸不平的路面鋪裝、畫線的地面、警告和勸阻標誌等。

在限定性較強的區域，以上三種方式可以并用，以加強攔阻之效。

（2）引導 通過形象或空間符號引導和吸引行人（或車輛）按指定的路線（或方向）前進。引導的實現主要借助與道路、地標和領域邊緣相關的空間指示特征，比如連續性（如樹列、水流等）、色彩、高度、位置、造型的突出處理。所有環境設施或強或弱都具有這種能力，但只有與城市景觀有機結合起來，綜合考慮才會發揮有力的作用。

（3）分割 在城市環境或場所中通過空間界定等手段強調不同性質和功能區域，它對人的通行并不形成限制，而只是一種提示和啟發。比如地面的特殊鋪裝則通過色彩、材料肌理和地坪高度的變化將不同的活動區域分割開來。

（4）掩蔽 對城市環境或場所空間的某一部分，通過布置設施的手段進行遮擋。它與分割相比顯然具有一定的強制性，其目的有四：①在公共活動空間和喧囂的場所中獲取相對安靜且具私密性的環境。為減少或避免過往人流及嘈雜聲音的干擾，通常采用綠籬、照壁等局部處理方法；通過圍蔽的下沉式庭院（廣場）也可以得到鬧中取靜的有限環境。②減弱環境交通對周圍環境的干擾。除設置綠化帶和某些環境設施（如廣告牌、候車廊）進行局部遮擋之外，在特殊地段如居民區、醫院、學校等）還需設置聲障（防音壁）等。③改善場地小氣候。建築和綠化處理是主要的手段，同時還要借助某些掩蔽設施（牆、照壁、回廊等），達到夏天通風遮陽降溫、冬季擋風納陽保溫的目的，以提高場地環境的舒適度。④在景觀設計中遮擋某些缺憾或要暫時保留某些景象，以增加環境的整潔感和空間的層次。對某些難于補救的破壞現場和不雅景象，則采用硬性的掩蔽手段；在觀光的場所采用某些有創意的遮擋，有時會起到虛實并舉、小中見大和峰回路轉的功效。

在環境設施中功能形態的第二種表現方式是異質空間的中介。即對兩個相互對比的環境進行調和與過渡，以求人的視覺和心理的平衡，激發不同環境的活力。

人類生存的空間——環境無時無地不存在着復雜和矛盾的因素，無論是外觀或內在，它們呈現出封閉——開放、壓抑——自由、理性——感性、動態——靜態、實體——虛體、內向——外向等等現象。這多樣的二元現象同時存在的事實，揭示了人類復雜的心緒。它們的异同根源于東西方的哲學理念，是追尋地方個性文化的綫索，也反映在城市的某些傳統建築和環境設施中。

Landscape Architecture Articles

景觀建築小品

The landscape designer usually takes advantage of various natural elements to create and arrange the outdoor space to meet needs and pleasures of people.

Topography is one of the major and prevailing elements for it is the basis of all the outdoor activities, serving as both an aesthetic element and a practical element in the course of its application to design. Therefore, topography is the framework of the whole landscape as well as the background and support of elements. Appropriateness in the topographical layout and design will play a critical role in the design of other elements. Landscapes including buildings, plants and waterfalls are often based on topography.

The hill climbing corridor built on hills can alter the vision both horizontally and vertically so as to strew the whole group of buildings at random with height of topography. As a result, it can not only form rise and falls in architectural façades but also enrich changes in vision.

Second, as the support of the plant landscape, rise and fall in topography can produce or reinforce changes in the forest crown line.

From the angle of shape, landscape is a successive complex of both realistic entities and artificial entities. The former means the topography itself whereas the latter refers to the vast space, that is, the extensive area formed by each realistic entity. In the external environment, realistic entities and artificial entities are composed of diversified topographies to a large extent. Meanwhile, these terrestrial varieties often include the plain, the mound, the valley, the hillside, etc. In order to facilitate description, we tentatively isolate those varieties and study each separately.

景觀設計師通常利用種種自然要素來創造和安排室外空間以滿足人們的需要和享受。

在運用這些要素進行設計時，地形是最主要也是最常用的因素之一，地形是所有室外活動的基礎，同時可以認為它在設計的運用中既是一個美學要素，又是一個實用要素。地形是諸要素的基底和依托，是構成整個景觀的骨架。地形布置和設計的恰當與否會直接影響到其他要素的設計。建築、植物、落水等景觀常常都以地形作為依托。

依山而建的爬山廊，就能使視線在水平和垂直方向上都有變化，使得整組建築隨山形高低錯落，既能形成起伏跌宕的建築立面又能豐富視線變化。

其次，地形作為植物景觀的依托，地形的起伏可產生或加強林冠線的變化。

從形態的角度來看，景觀就是虛體和實體的一種連續的組合體，所謂實體即是指地形本身，虛體就是開闢的空間，即各實體間所形成的空曠地域。在外部環境中，實體和虛體在很大程度上是由複雜多樣的地形組成的，並且這些地表類型常常同時包括平地、丘陵、山體坡地、山穀等。為了便於敘述我們暫且將各類型分割開來看。

1. 平坦地形

平坦地形便於群眾性文體活動，人流集散，並造成開朗的景觀，也是欣賞景色、瀏覽休息的好地方。

平坦地形按地面材料可分為土地面、綠化種植地面、沙石地面與鋪裝地面，為了有利排水，一般要保持 $0.5^{\circ} \sim 2^{\circ}$ 的坡度。

(1) 土地面 可用作文體活動的場地，如在林中的場地即林中空地，其場地周圍有樹蔭的地方就宜於夏日活動和休憩。

(2) 沙行地面 有些地面有天然的岩石、卵石或砂礫，視其情況可用作活動場地或游憩地。

I. Flat terrain

The flat terrain is a good place for gathering the mass, for holding recreational and sports activities, as well as creating the open landscape and appreciating the landscape.

The flat terrain can be divided into the ground surface, the green planting terrain, the sand stone surface and the pavement surface according to the surface material. For the purpose of water drainage, 0.5° - 2° of slope is generally maintained.

(I) The ground surface can serve as the space for physical and recreational activities, such as spaces in forests, namely, empty spaces surrounded by shades are suitable for summer activities and rest.

(II) The Sand stone surface. There are natural rocks, pebbles or gravels on some grounds serving as exercise yards or places for rest.

(III) The pavement surface can serve as the square for gathering people, the place for appreciation of views and the venue for physical and recreational activities. It can be in the regular forms paved by bricks, slice stone, cement, prefab blocks, etc, or in the irregular forms in combination with the natural environment.

(IV) The green planting surface can form different landscapes with flowers and trees planted inside the lawn. A large expanse of lawns can hold physical and recreational activities, serve as the place for sitting and rest. The planted flowers can be admirable. The formed forests can also be for the sake of rest and admiration.

II. The projecting terrain

The projecting terrain serves the functions of shaping scenery, organizing space and enriching the gardening landscape. So the plain cities often make use of the original topography to dig out the earth hillock in the lake and form the new terrain features. In particular, this will play a key role in broadening the vision of the scenic spot.

The projecting terrain is mainly classified into the earth hill, the stone hill, and the complex between earth and hill, according to the main material.

III. Concave terrain

There are generally two ways to form the concave terrain: one way is that when the soil in one area of the ground is dug; the other way is that when two patches of protecting land are aligned together. The fundamental space of the concave terrain takes one place in most of our activities. It is the basic structure for the outdoor space. Inside the concave terrain, the degree of spatial restriction depends on the steepness and height of the surrounding slope, as well as the width of the space. Meanwhile, the concave terrain is also an introvert space free from the outdoor disturbance. It can move the attention of everyone inside the space to the center or the bottom.

Due to the self-contained and introvert quality of the concave terrain, it is an ideal stage for performance. People can enjoy the performance on the ground from the surrounding slopes. The spatial relationship between the entertainers or performers and the spectators is the very expression of the perfect quality of the concave terrain for view and admiration.

Thus, those open-air theatres and similar structures are generally built on the slanted ground or the natural low-lying ground.

(I) Gentle slope. The terrain with the slope less than 1° is subjected to water accumulation and unstable ground surface, unfit for holding activities. But it can be utilized after slight renovation. The terrain with the slope between 1° and 5° is relatively ideal for drainage, suited to a great majority of activities, especially for a large area of site (such as the parking lot, the playground, etc). It can serve as the venue for activities without any renovation. The terrain with the slope between 5° and 10° is only confined to activities covering not too much area. But this type of land has excellent conditions for drainage, granting with the sense of fluctuation.

(II) Middle slope with the grade from 10° to 20° . It can only be partially applied to use within a small scope. But it is relatively favorable terrain in the aspect of plant landscape.

(III) Steep slope with the grade from 20° to 40° . It is relatively difficult to serve as the venue for ordinary activities. With the cooperation of the flat ground, it can serve as the bleachers for the spectators or the land for plants, depending on its slope. The changing terrain can gradually transit

(3) 鋪裝地面 可用作人員集散的廣場、觀賞景色的停留地點、進行文體活動的場地。可用磚、片石、水泥、預制塊等鋪裝成規則的形式。也可結合自然環境做成不規則形式。

(4) 綠化種植地面 在草地中植以樹木花卉，形成不同的景觀。大片開闊的草地，可作文體活動和坐臥休息，種植的花境可供觀賞，形成的樹林也可供游憩、觀賞之用。

2. 凸地形

凸地形具有構成風景、組織空間和豐富園林景觀等功能，故平原城市常利用原有地形中挖湖的土堆山，形成新的地形形態特征，尤其在豐富景點視線方面起着重要作用。

凸地形按主要材料，可分為土山、石山和土石混合的山體等。

3. 凹面地形

凹面地形的形成一般有兩種方式：一是當地面某一區域的泥土被挖掘時；二是當兩片凸地形并排在一起時。凹面地形景觀中的基礎空間，我們的大多數活動都在期間占有一席之地。它們是戶外空間的基礎結構，在凹地形中，空間制約的程度取決於周圍坡度的陡峭和高度，以及空間的寬度；同時凹面地形是一個具有內向性和不受外界干擾的空間。它可將處於該空間中任何人的注意力集中在其中心或底層。

由於凹地形具有封閉性和內傾性，從而成為理想的表演舞臺，人們可從該空間的四周斜坡上觀看到地面上的表演，演員與觀眾的位置關係正好說明了凹地形的確具有易于觀賞的特性。

正因如此，那些露天劇場或其他涉及到觀眾觀看的類似結構，一般都修建在有斜坡的地面上或自然形成的窪地形之中。

from the gentle slope to the steep slope so as to connect with the hills. The waterfront side is gradually stretching into the water with the gentle slope.

Furthermore, the concave terrain is also compared to a solar heater. Because the sun directly shines to its slope so as to raise the temperature of the terrain, this terrain is warmer than other terrains with less wind and sand in the same area. However, the concave terrain has agreeable climate, it is still plagued by one defect, that is, relatively damp, especially around the bottom course. If measures are not taken to dredge the rain inside the concave terrain, it will flow and accumulate in the low-lying area. In fact, the concave terrain itself is a drainage area. Thus, the concave terrain has one another potential function, that is, to be a permanent lake, a pond, or a temporary reservoir in the wake of storm. Moreover, the concave terrain can also block the vision and behavior of human being, protect against chilly winter wind and noise, which should be taken into consideration in the landscape design.

All in all, the terrain is a critical element in the outdoor environment. It can not only directly affect the aesthetic feature, spatial feelings and field of vision of the external space, but also affect drainage, climate and the functional structure of land. Based on all these import functions and the fact that other elements in the landscape design depend on the ground level, we give the highest priority to topography in the course of design. In other words, how the landscape designer shapes topography will exert a direct influence upon the outlook and function of the landscape, selection and distribution of the plant materials. The experienced designer can always read completely and skillfully through the topographic drawing of this area and understand the significance of that area upon the design or layout. The topographic design with rational structure and perfect layout can lay a foundation for other design elements to avoid any irremediable defect in the later design stages.

(1) 緩坡 坡度小於 1° 的地形易積水，地表面不穩定，不太適合於安排活動和使用，但若稍加改造即可利用；坡度介於 1° — 5° 的地形排水較理想，適合於安排絕大多數的活動內容，特別是需要大面積場地時（像停車場、運動場等），不需要改造地形就可做活動場地之用；坡度介於 5° — 10° 之間的地形僅適合於安排用地範圍不大的活動內容，但這類地形的排水條件很好，而且開始具有起伏感。

(2) 中坡 坡度在 10° — 20° 之間，只能局部小範圍地加以利用，從植物造景的角度來說是比較有利的地形。

(3) 陡坡 坡度在 20° — 40° 之間，作一般活動場地較困難，在有平地配合時，可利用地形的坡度作觀眾的看臺或作栽植植物的用地；變化的地形可以從緩坡逐漸過渡到陡坡與山體連接，在臨水的一面以緩坡逐漸深入水中。

另外，凹地形又好似一個太陽取暖器，由於陽光直接照射到其斜坡而使地形內的溫度升高，使得地形與同一地區的其他地形相比更暖和，風沙更少，不過，盡管凹地形具有宜人的小氣候，但它畢竟還是有一個缺點，那就是比較潮濕，而且較低的底層周圍尤為突出，凹面地形內的降雨如不採取措施加以疏導，都會流入並淤積在低窪處，事實上，凹面地形自身就是一個排水區，這樣，凹面地形又增加了一個潛在的功能，那就是充作一個永久性的湖泊、水池，或者充作一個暴雨之後暫時用來蓄水的蓄水池，此外，凹地形還具有阻擋視線，阻擋人的行為及阻擋冬季寒風和噪音等作用，在景觀設計時也應考慮到。

綜上所述，地形是戶外環境中一個非常重要的因素，它不僅直接影響着外部空間的美學特征、人們的空間感和視野，而且還影響着排水、小氣候以及土地的功能結構。由於地形的重要性，以及景觀設計中其他所有要素均有賴於地平面這一事實，所以在設計過程中，我們首要考慮的因素之一是地形。換言之，景觀設計師如何塑造地形，直接影響着景觀的外觀和功能，影響着植物素材的選用和分布，也影響着鋪地、水體以及牆體等諸多因素。有經驗的設計師總是完全能熟練地「讀懂」一區域的地形圖，並能理解那一地區對設計或布局的意義。結構合理、布局完美的地形設計，可以為其他設計要素奠定基礎，避免在以後的設計階段出現難以彌補的缺憾。

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