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Sponge City Theory and its Application in Landscape

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Abstract: Currently, many sponge garden engineering are actual to input to construction in China economic rapid development and urbanization process constantly speeding up of situation Xia, but construction completed garden landscape in input using. In the future many performance are cannot meet people of requirements, it is found these fundamental reasons, this phenomenon are garden design is largely associated,so, how effective to processing sponge garden landscape design in the insufficient of at became has social from all walks of life concern of focus. Based on this, this paper will focus on the analysis of sponge city theory and its application in landscape planning, hoping for future practical work plays a certain role.

Key words: Sponge city, Landscape architecture, Plan, Measures

1. Connotation of Sponge Urban Theory

Relationship between water ecology and water environment, there are more complex ecological problems. It affects every aspect of ecological environment. At the beginning of city construction, ad-dress water resources problems in the city, generally for bodies of water and the river itself, to take the appropriate measures, although this approach can solve part of the problem temporarily,but not to be able to solve the problem of water resources, is the symptom, not the cause. Water ecosystem is a major cause of water ecological problems. So, to wants to from essentially solution city in the exists of water ecological problem, on must to from water ecological system starting, take corresponding of ecological measures, on water ecological system of function and structure for conditioning, change past of city rain management aspects,abandoned symptoms not root of drainage measures, through take construction rain garden or plant grass ditch, ecological method, to reached regulation city water resources emissions of purpose, for exists of runoff problem, can through take site source of method be solution. In addition, to take full advantage of regulating method of purification, and recycling and to solve the problem of runoff,fundamentally solve the safety problem of water resources, in order to reduce the possibility of city flood disaster, reducing the pollution load of urban runoff, and fundamentally solve the problem of water resources in cities, further improve the city's ecological environment[1].

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2. Relationship between Urban and Landscape Planning Sponges

Landscape planning in urban planning and building more and more attention in the late, green space planning for urban green space that life must be provided, reduced the city's dust, noise,greenhouse gases, but also for the city to provide adequate oxygen,water and habitable environments.

Sponge city-building process, the most important one is therationality of landscape planning. On the premise of rational planning to fully function of the urban landscape ecology in urban air quality, urban soil and water conservation ecological environment construction in the role. Through the planning and design of landscape, making the city as an ecological whole, resist outside interference to form more stable ecosystem. City landscape garden cannot clings to used original of construction way, passive to implementation conservation, and management, should to ecology of theory again awareness and construction landscape garden and understand landscape garden ecology on landscape garden of effect and role, awareness landscape garden plant in landscape garden planning in the by up to of important role, especially to processing good ecological plant and garden plant of community relationship,people and ecological community Between of relationship, further strengthening garden green and economic of awareness. Only in this way can give full play to role of ecological landscape planning.

3. Sponge City Theory and Its Application Landscape Planning

3.1 Social significance

Sponge with new concepts in urban construction, and provide new ideas for urban construction. With urbanization speed of speed up,city population surged, caused has city water resources of serious lack, in some big city in the exists flood disaster frequency sent,water resources pollution serious of problem, sponge city construction will achieved city design and development construction and water circulatory system of fusion, can using these city around of green, and Park, concentrated store rain, effective regulation surface runoff, not only can effective protection natural water, ease city water resources pressure, also will became build people and natural harmony symbiosis city of breakthrough[2].

3.2 Economic significance

Sponge using pay more attention to the protection of natural water system of the city, through natural ecological function recovery and urban water ecological function of manual intervention, to effectively control the rainwater runoff, reduce source emissions.In addition, you can reduce the occurrence of disasters and floods,economic losses, provide a reliable way for the development of the city, saving local fiscal expenditure. Water storage facilities and urban green space have been combined, will significantly reduce the water pollution control cost, local environmental governance cost savings and enhance effective utilization of the funds[3].

3.3 Ecological importance

Sponge City promotion can also reduce the proportion of urban sclerosis, increasing green space of city construction. By setting up a green roof, permeable pavement and Green parking lot, bio-foam measures such as detention pond system, more than 75%to dissolve on the spot and utilization of rainfall, minimize development impacts on the ecological environment of the project,enhancement of water logging prevention capacity. Sponge city use and promotion has made an outstanding contribution to the construction of the city, which allows coordinated development of urban and natural environment, cities and the environment is in a State of balance and harmony, promote long-term, sustainable development and environment.

4. Landscape Planning and Theory of Sponges in the City Point

The park covers an area of 58.58 hm^2, construction 1.40 hm^2, green53.06 hm^2, 3.56 hm^2 road Plaza, 0.56 hm^2 water. Drain in the Park using grass ditch, runoff in transmission at the same time,some rainwater infiltration recharge of groundwater. Calculated according to the runoff, produce rainfall of 104 m 3 Park years,Park of the year rain water than landscape, combined with water facilities and terrain, set 3 rainwater storage, size 300m^3/ Seat. Figure 1 is a park of low impact development storm water system flow chart.

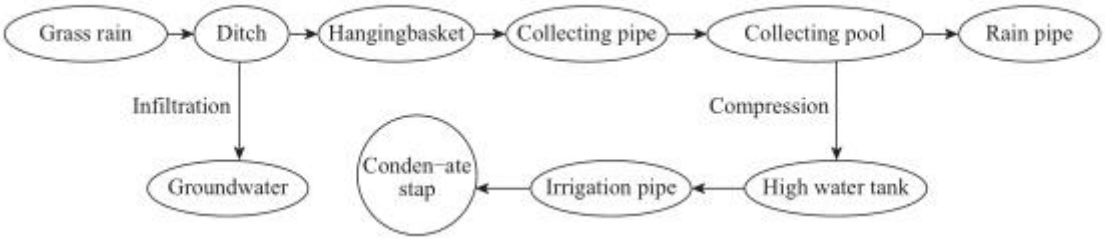

Figure 1 Park of low impact development storm water system flowchart

4.1 Rational choice “cavernous”

Sponge building there are three main aspects of the landscape,namely: protection of original ecological landscape garden system,damaged ecosystems in the past and gradually restored, and low impact development. However, current sponge landscape garden in construction completed In the future input using of process in the is appeared has many problem, some sponge landscape garden “sponge body” of sucking water is less than local of precipitation, also some sponge body in input using of process in the appeared has damaged, caused these phenomenon appeared of fundamental reasons are is staff in landscape garden design process in the on “sponge body” of attention enough, no according to local of reality select “sponge body”, because China territory vast, all area of environment, and Climate, and there is a big difference, so precipitation is different for each city. So, to put sponge landscape garden of role and value full of show out, staff in design process in the should on “sponge body” caused enough more of attention, combined local of reality to select by need of “sponge body”, and on by need of “sponge body” quality for strictly of marked, such do conducive to sponge landscape garden of actual construction process in the, construction units according to related of standard information for purchase, to guarantee has “sponge body” of quality and practical[4].

4.2 Landscape ecological structure of the work

The Park’s current ecological conditions, including rivers, soil, and water conditions, basically to support the existing demand of biological species, surrounding construction of the production life of the residents. But in the channel of the river of sand, beaches of agricultural development such as damage to the ecological environment, the current park planning and ecological conditions of the basic balance. Main tributary rivers of the park ecosystem and shoreline for background, from a marine and shore based animal, plant and microbial factors such as ecosystem, rich in ecological diversity. Application of landscape ecology “matrix-patch-the-corridor” analysis of landscape structure, landscape elements in the area can be divided into ecological matrix and ecological corridors, ecological plaque. Combined with the new master plan, planning and urban design, in the ecological corridor densities, plaque, substrate protection and strengthening of core State,city construction and construction of Park ecological integration,formed spindle eco-network network structure to support urban development.

4.3 Green infrastructure and urban facilities

For the rain-flood resources management, source control is recommended, namely eco-storage facilities on flood of low impact development. Proposed planning area runoff coefficient and a dis-placement of control parameters, use of

pervious pavement, grass brick, permeable grid, planting delay tank, rain garden, sunken green, ecological wetland technology, reduce runoff, water flood,relieve the drainage of rain water pipe network pressure, build the distributed hydrological networks.

4.4 Landscape ecological pavement

Landscape garden of ecological Pavement is let landscape garden has sponge body of characteristics, can absorb rain, regulation surface runoff, like on landscape garden in the Green and river lake water, of Pavement are belongs to ecological Pavement, for example further description landscape garden of ecological Pavement how for of: first for road and platform of Pavement, permeable breathable and not pollution soil is ecological Pavement of purpose where, currently, in many of Pavement way in the, permeable pavement of effect compared compared good, But even also exists with pore jam problem and permeable poor, problem; second, is on water and Bank of cover, in city in the many natural river of,and water are because construction and for has artificial cover,will natural river into dark of sewer, this practices undoubtedly is attending, author recommends we in landscape garden construction in the as less transformation those natural of river and water,recovery city of natural circulatory system[5].

4.5 Green roof design

For roof for green design, drop peak reduction flow is roof green design of main means, usually used following four species way to reach this purpose: on vegetation layer for cut water, usually 10cm high of to was layer can interception 2 to 5 cm of rain; soil layer cut water, soil matrix and pore are can interception rain; using water layer cut water; water system cut water. These methods above, to make specific choices depending on the roof forms, so as to bring it into line with actual needs, can also achieve beautiful results.

5. Application Sponge City Landscape Planing Measures

“Sponge city” concept comes from industry and academia used to “sponge” to describe a certain absorption function of the city. In recent years, more scholars are likened the sponge to cities or the flood storage capacity of the land.

5.1 Urban ecosystem restoration and repair

Topographic characteristics of urban ecological plaque can be divided into three categories: forest meadows; rivers, lakes and wet-lands of farmland and wilderness. On the ecological restoration and renovation of the plaque the following specific recommendations: one is to build an ecological corridor. Ecological corridors to enable distributed broken plaque is organically linked to the role by building eco-corridors gradually form a diversity of habitats.Second, the delineation of the boundaries of urban construction.In urban construction in the future, focused on the protection of wetlands, with the aim of landscape ecological areas such as environmental protection. Meanwhile, in the course of urban and rural planning and construction, and not to harm the natural environment as the basis for urban construction, to achieve harmonious coexistence between man and nature, so as to achieve sustainable development. Third, building artificial wetlands. Natural wet-lands protection on the one hand, on the other hand construct artificial wetlands, it is important to maintain the city’s ecological environment[6].

5.2 Using “sponge city” theory of design and improvement of the urban environment

“Sponge city” presented with the ultimate aim of development is to promote human development in harmony with nature,to achieve sustainable development, building a harmonious eco-society. So that the city’s master plan is reasonable is crucial. While focusing on the protection of the natural environment, natural plaque, reasonable, balanced and sustainable development strategy research and implementation, while stepping on the city’s water system, green space, the rationalization of facilities such as road traffic planning. Specific proposals are as follows: first,deepen the

depth of the new reservoir, reduce the existing reservoir water temperature control of evaporation, thereby increasing water storage capacity. Give full play to the role of nature. Second, building detention pond, sunken green space and other facilities will be combination of rainwater and landscaping design, maximize retained rain water, in order to achieve recycling of rainwater[7].

All in all, the modern urbanization accelerates, as well as with the rapid development of the world economy, continue to highlight the various environmental problems, water problems has been one of the most important of all mankind "life-threatening", current,water resources, human beings need a relatively comprehensive and integrated plan. In light of this, the "sponge city"is an excellent way, treating water and ecological problems. This also requires that we must further study sponge after practical work theory and its application in the landscape development of the city, in order to promote better and faster development of the city.

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