This virtual simulation experiment teaching project is based on 3D modeling of virtual experimental environment and objects, without consumable or perishable experimental materials. Based on the real campus environment of a university in Beijing, the project design and construction of low-impact open green space environment, mainly including construction of green space based on low impact development (galleries and rainwater gardens), and the scene is identical. Students can design their own experimental procedures and select the corresponding parameters to implement the virtual construction process of landscape to meet the teaching needs of the experiment, which involves the following parameters.

(1) Structure types of the gallery: steel and wood structure, wood structure

(2) Style of the gallery: modern style, classical style

(3) Types of paving materials: granite, sintered brick, cement brick, cement permeable brick, sand-based permeable brick, ceramic permeable brick (See Table 2)

Table 2 Specifications and Structure of Paving Materials

Type	Common Specification	Structure (building order: from bottom to top)
Granite	30mm100*100; 30mm300*150; 30mm 300*300; 30mm 300*600	30mm 1:3 cement mortar; 100mm C20 concrete; 150mm 3:7 lime earth; rammed earth
Sintered brick	30mm 100*100; 30mm 100*200	30mm 1:3 cement mortar; 100mm C20 concrete; 150mm 3:7 lime earth; rammed earth
Cement permeable brick	30mm 100*100; 30mm 100*200	30mm coarse sand screed; 300mm graded gravel bedding; rammed earth
Merbau anticorrosive wood	50*100mm cross-section	50*50 anticorrosive wood keel; 100mm C20 concrete; 150mm 3:7 lime earth;
Sand-based permeable brick	30mm 100*100; 30mm 100*200	30mm coarse sand screed; 300mm graded gravel bedding; rammed earth
Ceramic permeable brick	30mm 100*100; 30mm 100*200	30mm coarse sand screed; 300mm graded gravel bedding; rammed earth

（4）Plant type: arbor (See Table 3)

Table 3 Arbor Planting

Species	拉丁名	Height m	Crown diameter m	Diameter at breast height cm
云杉	*Picea asperata*	5.5-6.5	2-2.5	——
华山松	*Pinus armandii*	5.5-6	3-3.5	——
榆树	*Ulmus pumila*	4.5-5	3.5-4.5	13-15
楸树	*Catalpa bungei*	6-7	3	13-14
枫杨	*Pterocarya stenoptera*	4-5	4-5	11-12
秋花北京栾	*Koelreuteria paniculata*	4-5	3-3.5	11-12Ground diameter
紫叶李	*Prunus cerasifera f. atropurpurea*	3.5	3-3.5	10-12Ground diameter
美人梅	*Prunus × blireana cv. Meiren*	3-3.5	2.5-3	10-12Ground diameter
山杏	*Armeniaca sibirica*	2.5-3.5	2-3	8-10Ground diameter

（5） Plant type: herb (See Table 4)

Table 4 Herb Planting

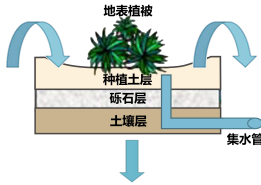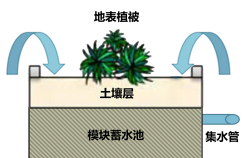| Species	拉丁名	Height cm	Planting density (per m²)
五色菊	*Brachycome iberdifolia*	20-25	12
旋涡千屈菜	*Lythrum salicaria*	50-80	16
粉萼鼠尾草	*Salvia farinacea*	40-50	12
虞美人	*Papaver rhoeas*	50-70	10
宿根鼠尾草	*Salvia japonica*	50-70	4
桔梗	*Platycodon grandiflorus*	60-100	8
黑心菊	*Rudbeckia hirta*	50-60	10
柳叶马鞭草	*Verbena bonariensis*	60-80	12
山桃草	*Gaura lindheimeri*	30-45	1

（6）Rainfall Data (See Table 5)
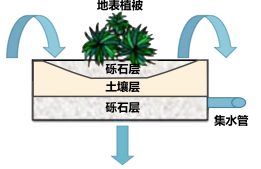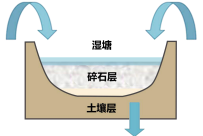
Table 5 Typical Rainfall Data in Beijing

Return Period	24 hours rainfall mm	Reference specification
1year	45	
2year	81	*Design Code for Rainwater Control and Utilization Engineering* （DB11/685-2013）
3year	108	
5year	141	
10year	209	

20years	270
50years	350
100years	416

（7） Rainwater Garden Construction (See Table 6)

Table 6 Rainwater Garden Construction

Item	Diagram	Structure(building order: from bottom to top)	Relative height difference
Sunken green space taking 1*1m as the module		300 mm planting soil 300 mm gravel Rammed earth	200mm below the green of the surrounding ground
Biological retention pond taking 1*1m as the module		50 mm gravel 300 mm planting soil 300 mm gravel Rammed earth	300mm below the green of the surrounding ground
Infiltration pond taking 1*1m as the module		300 mm planting soil 300 mm gravel Rammed earth	600mm below the green of the surrounding ground
Modular retention pond taking 1*1m as the module		Modular construction	1.5m below the ground