

## Expo 2019 Beijing China Site

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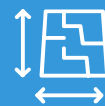
**Population** : 16 000 000

**Number of jobs** : 1 000

**Starting year of the project** : 2016

**Delivery year of the project** : 2019

**Key words** : Green life beautiful home



503



2 147 483 647 ¥

## ID CARD

In 2019, China World Horticultural Exposition in Beijing is approved by the International Horticultural Producers Association (AIPH) and approved by the International Exhibitions Bureau (BIE). The A1 World Horticultural Exposition, hosted by the Chinese government and hosted by the Beijing Municipal Government, is held in Yanqing District, Beijing, China. The area is about 503 hectares. The event will be held from April 29th to October 7th, 2019. The theme of the conference will be "Green Life and Beautiful Homeland".

The planning of the park adheres to the planning concept of "ecological priority, natural law; inheritance culture, openness and tolerance; technology wisdom, fashion diversity; innovation meeting, sustainable use", planning structure layout: one heart, two axes, three belts, multiple zones. The main pavilions of the China Pavilion, the International Pavilion, the Life Experience Pavilion, the Botanical Garden and the Pelican Theatre were planned, and the functions of exhibition display and forum activities were undertaken. More than 100 outdoor exhibition gardens were planned and constructed.

People-oriented World Garden. This year's World Expo will highlight the experience of greenery. Designing a gardening tree parking lot, waiting for the security area under the forest, and designing a tree-lined avenue on the main route to provide various shades. Plan the 8km long Weihe ecological leisure belt to form a natural forest oxygen bar.

A culturally diverse world garden. The park's planning is rooted in Chinese traditional culture, inheriting the essence of gardening for nearly three thousand years, showing Chinese charm, Beijing characteristics, and horticultural characteristics. At the same time, focusing on the world's multiculturalism, we will gather the best of the 100 families in an open and inclusive manner, and provide a stage for the world's horticulture to compete.

The World Garden of Science and Technology Innovation. Cooperate with Zhongguancun Industry Alliance, integrate high-tech technologies such as intelligent terminal display, robot human-computer interaction, holographic projection, molecular breeding, enrich the exhibition display mode, provide rich and diverse interactive experience, and realize the combination of travel, learning and music. Use the "Internet +", big data analysis and other advanced technology to create a smart world.

The ecologically enhanced World Garden. In line with the principle of optimal ecological function in the future, the use of recycling-saving ecological water system, ecological wetland purification and other advanced technology means to build a sponge park; scientifically configure plant species and quantity to form a rich and diverse bio-community.

The World Garden Association for Industrial Development. Based on the use of the conference, the development of the horticultural industry development zone, the frontier technology and culture of flowers, fruits, vegetables, tea, medicine and other industries will be

displayed in a concentrated manner, providing a platform for the promotion and marketing of horticultural products, and effectively promoting horticulture into the daily life of the public. Create an annual Beijing Flower Show brand, build a kaleidoscope project, and cooperate with the masses to participate in the ice and snow sports brought by the success of the Winter Olympics, and create a new hot spot for the all-weather gold belt in the northwest of Beijing, and drive the gardening and tourism of Beijing, Tianjin and Hebei. The green industry has entered a period of development.

## Programme

- Others

## CO2 Impact

CO2 Impact : 131 686 CO2

## Method used to calculate CO2 impact

1	2	3	CECS 374:2014
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## Project progress

- Operational phase

## Prescriptions and zoning

- Mountain area regulation

## Key points

- Economic development
- Mobility
- Energy /Climate

## Approaches used

- Others

## Data reliability

Self-declared

## TERRITORY

### Type of territory

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## KEY FIGURES

### Green areas, roofs included

Green areas, roofs included : 2 729 781 m<sup>2</sup>

### Public spaces area

Public spaces area : 75 660 m<sup>2</sup>

### Commercial floor area

Commercial floor area : 5 200 m<sup>2</sup>

### Public facilities floor area

Public facilities floor area : 7 500 m<sup>2</sup>

### Green spaces /inhabitant

0.17

### Total investment costs (before tax)

Total investment costs (before tax) : 704 ¥/m<sup>2</sup>

## GOVERNANCE

## Project holder

**Name :** Beijing World Horticultural Exposition Coordination Bureau

**Type :** Autre

### General description :

According to the "Reply of the Central Committee for the Establishment of the Coordination Bureau of the Beijing World Horticultural Exposition" (Central Preparatory Remarks [2014] No. 2) and the "Notice of the Beijing Municipal People's Government Office on the Establishment of the Beijing World Horticultural Exposition Coordination Bureau" ( Beijing Administration Office issued [2014] No. 15), established the Beijing World Horticultural Exposition Coordination Bureau (referred to as the World Park Bureau). The World Park Bureau is the office of the Executive Committee of the Beijing World Horticultural Exposition in China (referred to as the Executive Committee) in 2019. It is an independent legal entity. According to the authorization of the Executive Committee and the municipal government, the World Tourism Bureau undertakes the daily work during the preparation and organization of the 2019 China Beijing World Horticultural Exposition. (1) Responsible for the relevant legal affairs of the World Expo; (2) Organizing and researching the impact of the World Expo on regional economic and social development, and proposing policy recommendations; (3) Responsible for the organization, coordination and operation of the planning and construction of the World Expo Park (4) Responsible for the coordination and promotion of major infrastructure planning and construction related to the World Expo; (5) Organizing investment promotion, exhibition, publicity and publicity work; responsible for the organization management and coordination of the market development of the World Expo (6) Responsible for liaison and coordination with the International Exhibition Bureau, the International Horticultural Producers Association and the World Horticultural Association Organizing Committee Liaison Group Office, the Special Working Group of the World Expo Council Executive Committee, and the Yanqing County Preparatory Leading Group; The meeting of the committee is scheduled to take on the daily work of the executive committee.

## Project stakeholders

China Academy of Building Research Ltd.

**Function :** Technical consultancy agency

Focusing on the planning concept, technical system, operation management and sustainable development after the meeting, we will collect relevant evaluation data of green ecological parks, and refine the advanced, innovative, exemplary and popularized green ecology.

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## Quality of life / density

In the park, we will build a traffic organization structure of "one heart, one ring, four circles", reasonably organize pedestrian parks, car dealers and freight traffic in the park, and organize "three hours - seven hours - two days" three types of fine gardening for different tourists' tourist needs. Tour the route and set up a parade in the core area. In combination with the needs of humanization, shading facilities are installed in the main traffic streamlines and staying areas; the spacing of rest facilities in the park is  $\leq 100$  meters, and the rest seats are arranged in a combination of concentration and dispersion, and the outdoor area is equipped with sunshade and rain protection measures, and Facilities such as self-service vending machines, drinking water, and electronic maps for exhibitions are set up. The barrier-free toilets in the whole park reach 100% coverage. The ratio of the number of toilets for male and female toilets is 1:3, and there is no gender toilet and maternal and child room. According to the distribution of demand, and comprehensive various types of fixed and temporary ancillary service facilities, we plan a dining facility with a service radius of 200 meters, a total of 7500m<sup>2</sup> of combined shopping facilities, and 17,000 square meters of consulting and medical services. .

## Culture and heritage

The historical and cultural resources of the park have been sorted out to form the historical and cultural context of the spatial layout of the park. It not only protects the specific cultural relics in the park, but also preserves the local style and inherits the culture of regional culture in the planning of architectural design.

Cultural Relics Protection: Protecting the remains of a certain historical and cultural value - Beacon Tower, Gujing, etc. The combination of monument protection and venue facilities will play an active role in understanding the long history and culture of the world.

Texture protection: Respect local culture, preserve the local style, and protect the original texture and pattern. The buildings and landscapes in the horticultural town show a rustic and honest landscape.

Regional culture: It is characterized by regional culture and creates a characteristic space that carries historical memory. For example, the Tianyuan District, which represents the Chinese horticultural culture, the Yongning Pavilion, the high ground of the Liao-Song architectural style, and the No. 1 ritual gate that condenses traditional Chinese elements.

## Social diversity

Smart Navigation Guide: Use the "Smart World Garden" APP tour guide function to provide support for the diversion of visitors, the distribution of management personnel, and the rational use of campus service facilities resources, and enhance the visitors' sense of wisdom and garden experience.

The ultimate experience service: through the comprehensive use of artificial intelligence, virtual reality (VR) and other high-tech, to build virtual landscapes and interactive scenes, to create a comfortable and convenient, immersive tour environment and a variety of ways to visit.

Park service and integrated management based on big data analysis of tourists: use big data analysis, WIFI positioning, video intelligent analysis and other technologies to effectively collect, integrate and analyze visitor data, and perceive, monitor and alert key venues or areas to make the park efficient Operational and leadership decisions provide data support.

Create a new mode of night tour: Through human-computer interaction technology, the interaction between virtual video content and tourists and the natural environment of the park can be organically combined to create a science fiction light and shadow forest, providing a new night experience environment and a new mode of sightseeing.

## Social inclusion and safety

The characteristic experience of "The Story of Life". Interpret the "story of life" in the process of seed growth, using the seeds to germinate - the necessary conditions for the results: soil, water, wind, sunshine, temperature, reflecting the cycle of the seeds and the continuous continuation of life. Advocate green ecological themes, remind people to recognize the potential crisis of the earth, and build a society that lives in harmony with nature.

The experience of "ecological technology". The specific design uses ecological science and technology such as low-impact development, zero-emissions of sewage and low-energy buildings, and proposes relevant technical measures for the waterfront environment, architectural design, landscape facilities and planting greening of the park. Demonstrate a scientific landscape that follows ecological principles.

The interesting experience of "ecological science knowledge". The use of clean energy, natural environmentally friendly materials, and ecological monitoring systems to promote the popularization of science knowledge, educational activities that are fun and entertaining, experience facilities with high participation, and high-tech interesting pieces to promote the natural knowledge among people. communicate with.

## Ambient air quality and health

Soundscape planning: establish a sound point and face level planning control system, control the sound within 45-70 decibels, in order to give people the best auditory enjoyment; use the noise reduction system to divide the road and important nodes to make the road noise as possible Less entry into the venue, each venue as much as possible to form a simple, unified atmosphere.

Green shading: combined with the zoning function and spatial characteristics within the planning scope, comprehensively considering the traffic flow and the concentration of people, and rationally formulating the zonal shading target. The different "line + point + surface" combination constitutes the green shading system. Functional partitioning, the final shade of



the park reached 30.5%, and the public space shade rate reached 51.8%.

Ecological water vein: retaining and expanding the constructed wetland as the starting and source of the ecological water vein. By receiving the reclaimed water from the sewage treatment plant, after the wetland purification treatment, the water quality of the park water is not lower than the Class III water quality of the surface water, maintaining the quality of the park. Non-traditional water demand for water sources to ensure the safety of non-traditional water sources.

## ECONOMIC DEVELOPMENT

### Local development

Lisiguanzhuang Village is located in the core landscape area. The village is relocated as a whole, and the land is placed in the surrounding area, and the employment of the villagers is arranged in the park. Gujiaying Village is located on the south bank of the Qinshui River in the fenced area. The villagers moved out of the resettlement, and the original site was moderately upgraded and upgraded, and the function was implanted. It was used as a horticultural village during the World Expo. The three villages of Dafengying Village, Dalu Village and Xiaodafengying Village are located in the non-fenced area, retaining the original site of the village, improving the environmental quality, improving the living support level, promoting industrial upgrading, providing more employment options, and creating an ecological environment. A model for the development of life and production linkage.

After the conference, the park will be transformed into a regional large-scale ecological park, which will become an important part of the tourism system in the northwestern part of Beijing-Tianjin-Hebei. Together with the Badaling Great Wall, Chongli and Chengde, it will create a multi-day golden tour line to complete the upgrade of Yanqing City. . At the same time, the annual Beijing Flower Show brand will be established, together with the surrounding areas, to become a gathering area for the horticultural industry, and undertake the functions of horticultural research, production, display and trading.

### % of public spaces

2

### Circular economy

Create a good classroom for ecological civilization. After the conference, the China Pavilion was transformed into a national-level ecological museum; the Botanical Garden continued to serve as a core venue for the World Expo, providing youth education facilities, exhibitions and other external service functions.

Cast a new engine for green development. Relying on the horticultural industry belt, it gathers cutting-edge technologies and cultural elements of flowers, fruits, medicines, vegetables, tea and other industries to build a world-class horticultural cultural function zone and promote the development of the horticultural industry.

Helping the new guarantee of winter Olympics. After the event, the World Park Hotel will serve as an important carrier for the Winter Olympics and Yanqing tourism and leisure industry to create a horticultural theme resort hotel; after the security command center will transform some areas into hotels that provide the necessary services for the Winter Olympics.

Construct a new landscape of ecotourism. The park combines the Badaling and Zhangjiakou areas to construct a rich eco-tourism belt. A horticultural town that builds a gardening-led cultural tourism industry. The business package will be transformed into the subject business for operation.

## TRANSPORT

### Mobility strategy

External traffic: improve the road network around the park, form a network tie line system connecting the park and the three surrounding expressways; increase the bus to achieve intensive travel; set up cut-off car parking lots in different layers, change the travel structure; strengthen traffic demand Management, reducing the level difference between extreme peak days and weekday passenger flow.

Internal traffic: The people and vehicles in the park are diverted, the road space is miniaturized, and the tall trees are planted in the landscape to create the effect of the green trees. During the session, the main battery cars and floats at different times were clean energy vehicles. The transportation facilities such as the battery station and the public green space are integrated. The battery station in the road is coordinated with the passenger waiting space in the green space; the sidewalk is coordinated with the green landscape and gardening sketches. At the same time, the construction of the park also adopts environmental protection measures such as the use of earthwork in the area, the recycling of existing asphalt concrete, the filling of tree pools with environmentally-permeable and permeable materials, and the use of existing bridges.

## SMART CITY

### Smart City strategy

Wisdom View: Based on Augmented Reality Technology (AR) as the core, integrating virtual

reality technology (VR), spatial positioning and other technologies, we have developed a smart viewing system to achieve the integration of culture and technology.

**Smart Transportation:** In the transportation planning stage, traffic simulation and comfort assessment studies were carried out to simulate and predict the flow of people at the entrances, exits, roads and venues of the park to optimize the entrance and exit and road design.

**Smart Building:** The core venues in the World Expo will follow the intelligent architectural design concept and technology, and introduce information application systems, indoor environmental quality monitoring systems, intelligent building monitoring systems, efficient energy monitoring and energy efficiency optimization systems, video security monitoring systems and electronics. Patrol system, etc.

**Wisdom light pole:** Smart street light relies on LED street light and intelligent control platform, integrates WIFI base station, camera, infrared sensor, electronic display and other technologies to become information carrier, realize data monitoring, environmental monitoring, security monitoring, light pole screen, emergency alarm, etc. Features. It provides a complete carrier for the construction of smart parks, and provides the ability to respond to public management, security and emergencies in the park through integration with big data, Internet of Things, cloud computing, and wireless communication technologies.

**Wisdom Pipe Gallery:** The total length of the underground intelligent integrated corridor is about 3.4 kilometers. It integrates various engineering pipelines such as electric power, communication, gas, heat supply, water supply and drainage, and has a special inspection port, lifting port and monitoring system. Unified planning, unified design, unified construction and management can realize online monitoring and alarming of various engineering pipelines in the pipe corridor, and realize data analysis and management through the IoT platform.

## RESOURCES

### Water management

Through the measures of quality water supply, water-saving irrigation and non-traditional water resources utilization, a multi-saving water supply guarantee system will be constructed.

Coordinate low-impact development, rainwater removal and drainage systems to build a sponge-type rainwater management system.

Fully consider the characteristics of the park, and build a cost-effective sewage treatment system based on the principle of decentralization and concentration.

Combined with the construction of water supply, rainwater, sewage and reclaimed water system, through the regulation of the water ecological chain, a comprehensive water environment and water ecological system with purification capacity can be constructed.

Specific measures include: flushing in the park, greening irrigation (except for special exhibiting plants), road sprinkling, landscape water and other water use all non-traditional water resources; rainwater in the park is basically discharged into the internal landscape water body; rainwater is set before the water body Pool or ecological buffer zone; adopt ecological drainage method such as ecological ditch; 100% ecological shoreline; 100% river blue line delineation; internal sewage is fully collected and treated, reused; external sewage is purified by wetland.

## Soil management

Soil conservation and improvement. The specific measures include: measuring the soil fertility and pH value in the park, and arranging several points in different habitats, and not less than 5 soils of 0-20cm and 20-40cm in each habitat, for testing, and carrying out the current soil. Analysis and evaluation; intercept pollution sources, avoid soil pollution by water; prevent soil pesticides, fertilizers and other pollution; increase the park's natural fertility, prevent soil erosion; artificial soil improvement for poor land to meet the requirements of plants for water and fertilizer.

## Waste management

During the exhibition period, the amount of domestic garbage produced is about 26 tons per day, and the normal period of domestic garbage is about 12 tons per day. The garbage is relatively scattered and relatively concentrated in the exhibition halls and supporting buildings.

According to the goal of near zero discharge of solid waste and a resource utilization rate of not less than 90%, set up waste bins for pavilions and supporting buildings, parks and open spaces, and build closed garbage collection stations to concentrate life in the corresponding areas. Garbage; separate collection and storage of kitchen waste; centralized collection and transportation of garden waste, manure, etc.

The waste is transported by special vehicles and transported to the nearest solid waste treatment center for resource treatment.

# BIODIVERSITY

## Biodiversity and natural areas

The ecological landscape mechanism of the park before development is good, and there are large areas of forest land, water system, farmland, etc. In order to fully respect the existing ecological and landscape environment, combined with local characteristics, the biome, types and quantities are investigated. According to the survey results, the target species such as common birds, fish, butterflies and frogs are selected as habitats, the protected areas are not

destroyed, human disturbance is prohibited, and the plant configuration and optimization or transformation of major environmental factors are targeted. Species provide foraging, sheltering, and breeding grounds to meet the environmental needs of their habitat and survival. Thereby creating diverse biological habitats, enriching biomes and improving the biological circulation system.

## ENERGY/CLIMATE

### Climate adaptation, resources conservation, GHG emissions

A large number of vegetation and green ecological corridors in the park have the functions of protecting ecological diversity and carbon sinks, which can alleviate the heat island effect, change the wind speed and direction, prevent sand and water sources.

Carbon sink statistics: Based on the Internet of Things technology, real-time display of information such as biodiversity of the park and related data release technologies, and statistics on plant clusters and representative plant carbon sinks.

Green transportation: The transportation in the park adopts 100% green travel mode. The main means of transportation are bicycles and electric shuttle buses.

Personal "carbon footprint": The park introduces an international "carbon footprint" evaluation method based on humans, and collects carbon emission data on tourists' transportation, food and garbage, and provides suggestions on carbon reduction behavior to guide people's low-carbon lifestyle.

Establish a carbon emission statistical model: introduce green design simulation display technology, and use relevant information technology to study the principle simulation of the green building technology of the park, such as building energy conservation, water resource utilization, renewable energy utilization, park transportation, landscape road lighting, etc. Dynamic display system, covering real-time display of water quality monitoring and situation distribution in the park, and carrying out relevant energy consumption and carbon emission reduction data display and release system.

### Energy sobriety

Optimize energy consumption: Establish a smart energy consumption analysis management system, collect energy consumption data in a timely manner by means of remote transmission, realize online monitoring and dynamic analysis of building energy consumption, and tap energy saving potential.

New building energy-saving ratio: All new buildings in the park meet at least the design requirements of Beijing Green Building One-star, and the energy consumption design value is lower than the energy consumption value stipulated by the current Beijing energy-saving

standards. The energy saving ratio of new buildings is 100%.

Energy cascade utilization: vigorously develop new energy and renewable energy (using deep well geothermal, shallow ground temperature, water storage). In the feasibility study stage of the energy system, we will predict and analyze the heat and cold load of major energy users, China Pavilion, International Pavilion and greenhouses, give full play to the concept of energy cascade utilization, and design the energy supply system with geothermal energy as the main energy source.

Renewable energy: The main pavilions in the park are the largest energy users in the park. The replacement rate of renewable energy is more than 40%, and the replacement rate of renewable energy in the whole park is more than 25%.

## Energy mix

The energy supply in the park has been rationally planned, and the use of renewable energy and multi-energy complementary energy forms have been used to provide cooling and heating for the park. Winter heating uses deep geothermal + shallow geothermal + water storage + peaking boiler, and summer cooling uses shallow geothermal + water storage + peaking electric machine. The types of renewable energy used in the park are mainly solar energy, shallow geothermal energy, and biomass energy. Among them, the geothermal well has two eyes, and the method of step utilization is adopted. The deep geothermal water has a high temperature. The heat exchanger is used to directly exchange the secondary water to supply heat to the building, and then the heat pump unit is further used to extract the hot water after the heat exchange. After the secondary energy is used, the geothermal tail water is recharged, and the heat is taken as much as possible to protect the groundwater resources. The renewable energy utilization rate of energy stations in the World Expo Park is over 60%.

## Total electricity production of the project area /year

Total electricity production of the project area /year : 37 730,00 kWh

## BUILDINGS

### Buildings

100% of the large public buildings ( $\geq 20,000$  square meters) in the World Expo Park reach the Samsung standard of green buildings, including the China Pavilion, the International Pavilion and the Life Experience Pavilion.

China Pavilion: The land area is 48,000 square meters and the total construction area is 23,000 square meters. The upper roof is double-layered, the exterior is photovoltaic solar panels and hollow laminated glass, and the inside is ETFE membrane, which achieves



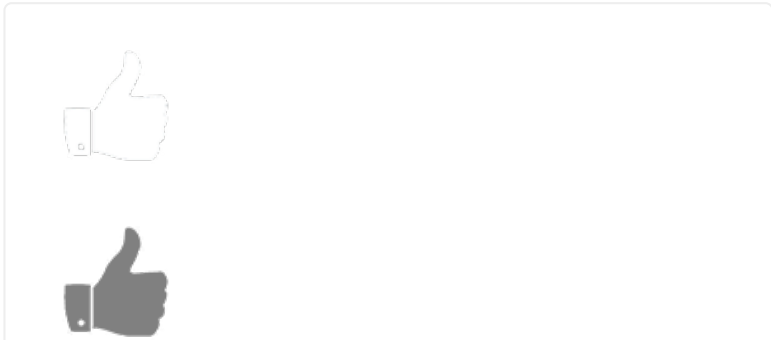
energy-saving standards. The introduction of authentic air technology, air cooling in summer, and air heating in the shallow water in winter, ventilation and energy saving measures can greatly shorten the air-conditioning opening time and effectively reduce the energy consumption of buildings.

International Pavilion: The land area is 36,000 square meters and the total construction area is 22,000 square meters. The international pavilion is made up of 94 flower umbrellas, like a sea of flowers falling in the park. The design of the umbrella is not only beautiful, but also has the functions of sunshade, solar photovoltaic integration and rainwater harvesting, which effectively improves indoor lighting conditions, greatly enhances indoor natural lighting and light environment comfort, and achieves energy saving and water saving goals.

Life Experience Hall: The land area is 36,000 square meters and the total construction area is 21,000 square meters. With grid-like street layout, modular building elements and tall and square interior, it has strong variability and applicability in use, especially suitable for flexible adjustment according to the function needs of the meeting and the meeting. . At the same time, in order to meet the needs of the large span of the exhibition space, the design uses a fabricated steel frame structure system. The use of recyclable materials has achieved the goal of green materials.

## Contest

### Building candidate in the category





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