



The 2020 international workshop

CEPC CIVIL ENGINEERING

Hu Zhou • Zhe Jiang

Huadong Engineering Corporation Limited 2020.10

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- 1 Hu Zhou Site Introduction**
- 2 Construction Conditions Analysis**
- 3 Project Digital Management**
- 4 Conclusion**

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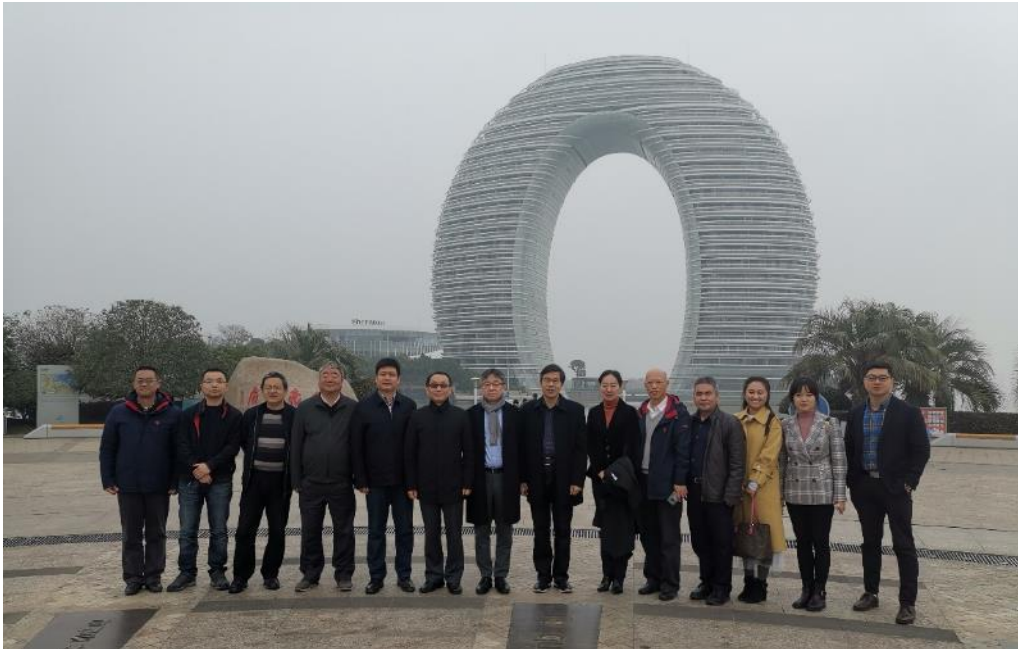


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➤ Introduction to Hu Zhou Site

March 2018

October 2020



Joint investigation team of
ZheJiang government and IHEP

- **CEPC report on site selection (Zhejiang Huzhou)**
Answer the questions-Why did CEPC choose huzhou
- **CEPC report on socio-economic assessment**
Answer the questions-Why did huzhou choose CEPC
- **CEPC Technology Design Report on Civil engineering of the first stage**
- **CEPC report on science city concept plan**
Find a comfortable home for scientists

➤ Introduction to Hu Zhou Site



Hu Zhou Site
Northern Zhejiang Province
the center of the Yangtze River Delta



Shanghai



Nanjing



Hangzhou



Shanghai Jiao Tong University



Zhejiang University

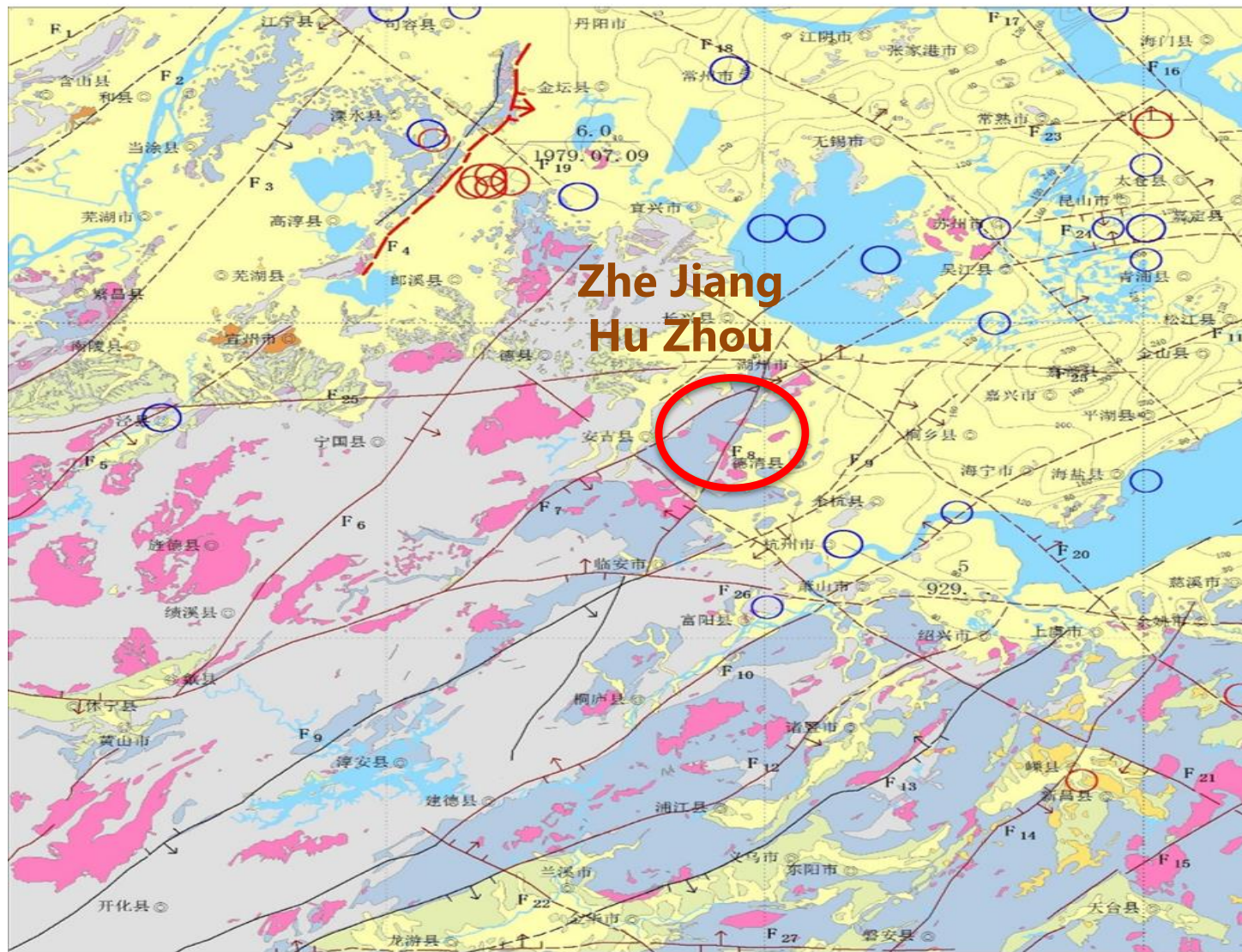


University of Science and Technology of China



Nanjing University

Introduction to Hu Zhou Site

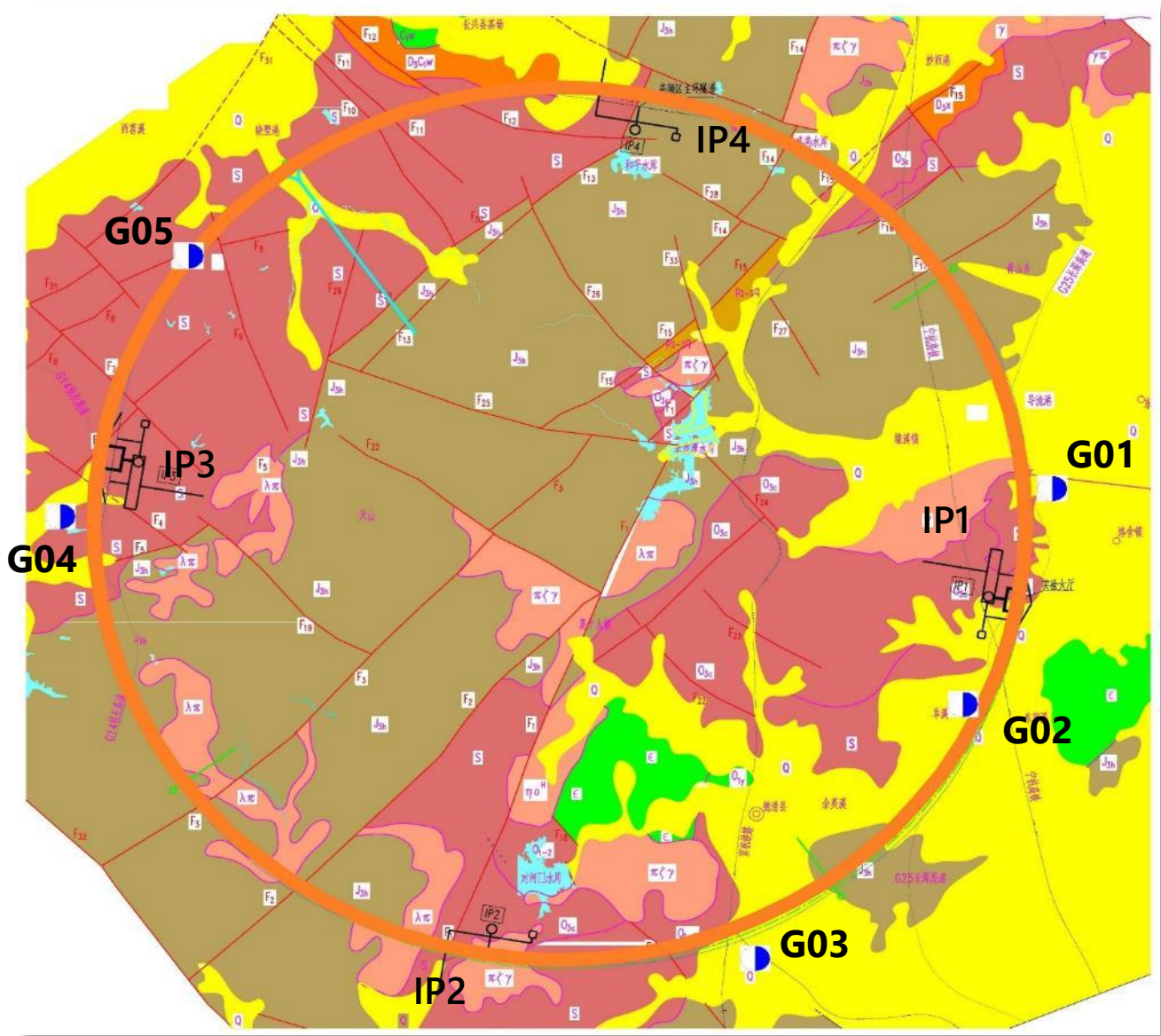


stable earth crust

- no active fault
- the PGA is 0.05g,
- Basic intensity is VI

Regional seismic geologic zoning map

➤ Introduction to Hu Zhou Site

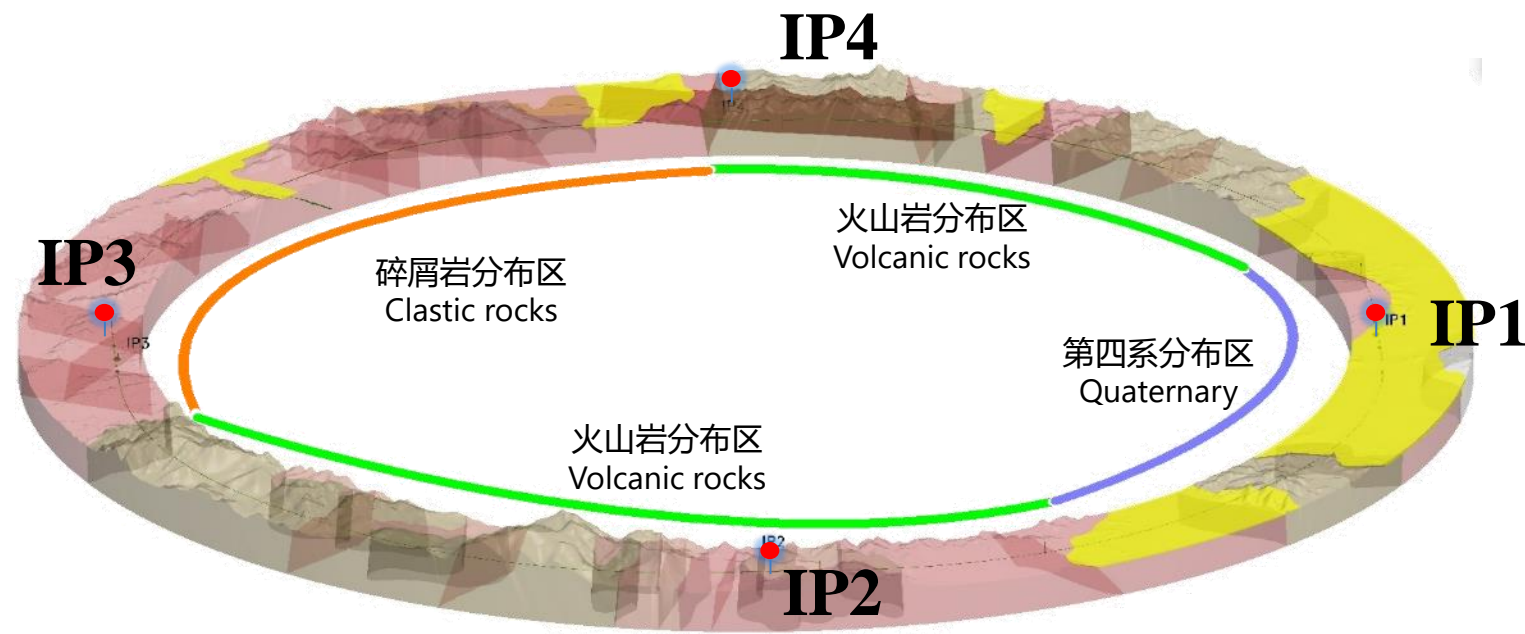


G04钻孔奥陶系砂岩部分岩芯 (IP3)
The Ordovician sandstone cores in G04 hole (IP3)

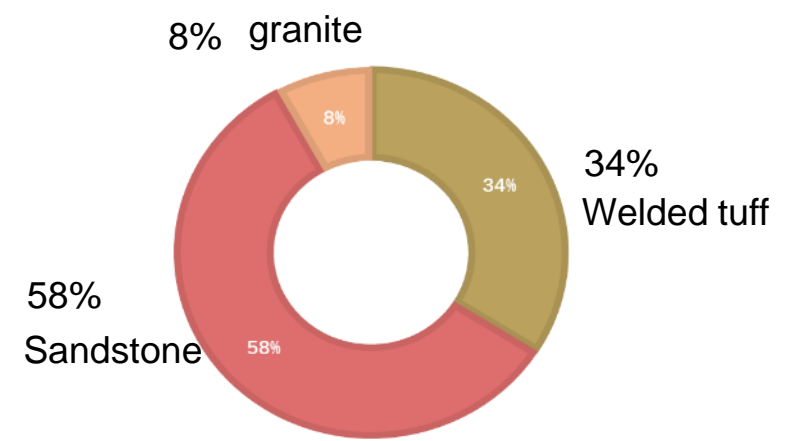


| | | |
|--------------------------------|----------|-----------------------------|
| Q | 第四系 | the Quaternary |
| J _{3h} | 侏罗系熔结凝灰岩 | Welded tuff of the Jurassic |
| D ₃ C _{1w} | 泥盆系砂岩类 | Sandstone of Devonian |
| S | 志留系砂岩类 | Sandstone of Silurian |
| O | 奥陶系砂岩类 | Sandstone of Ordovician |
| E | 寒武系灰岩 | Limestone of Cambrian |
| | 花岗岩 | Granite |

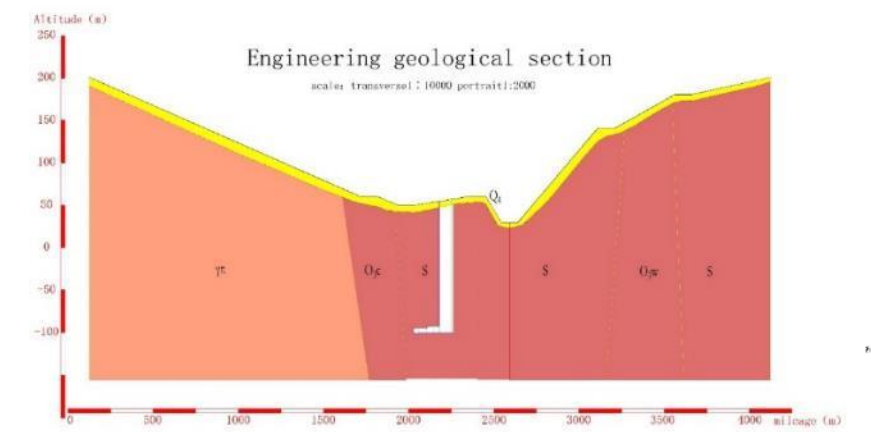
➤ Introduction to Hu Zhou Site



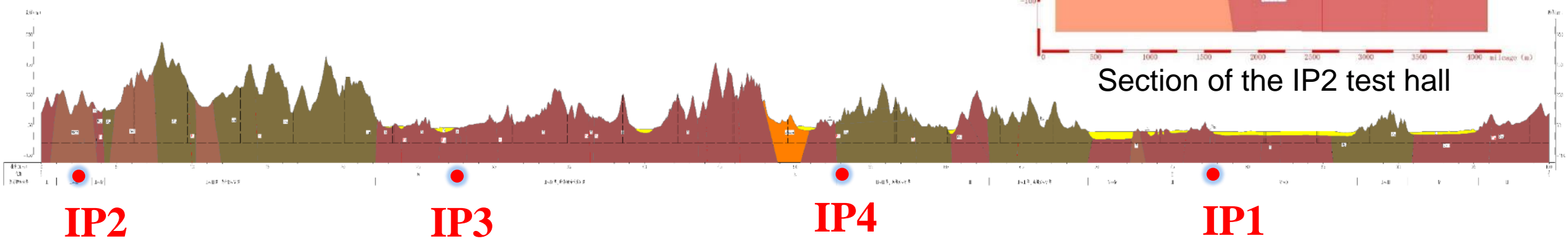
the 3-dimensional geological image



Lithologic of surrounding rock



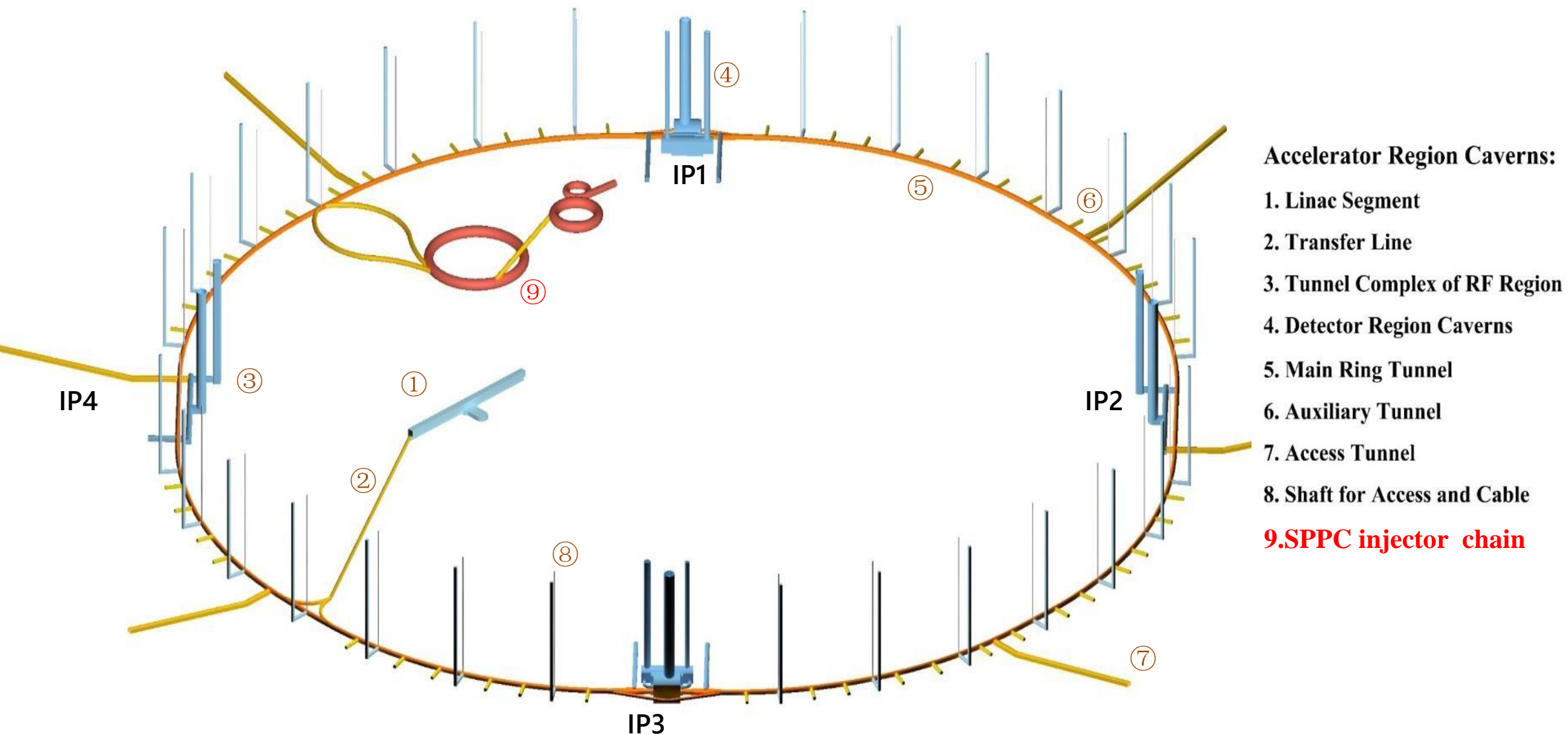
Section of the IP2 test hall



Longitudinal profile of the main tunnel

The minimum depth of the main ring is 70m

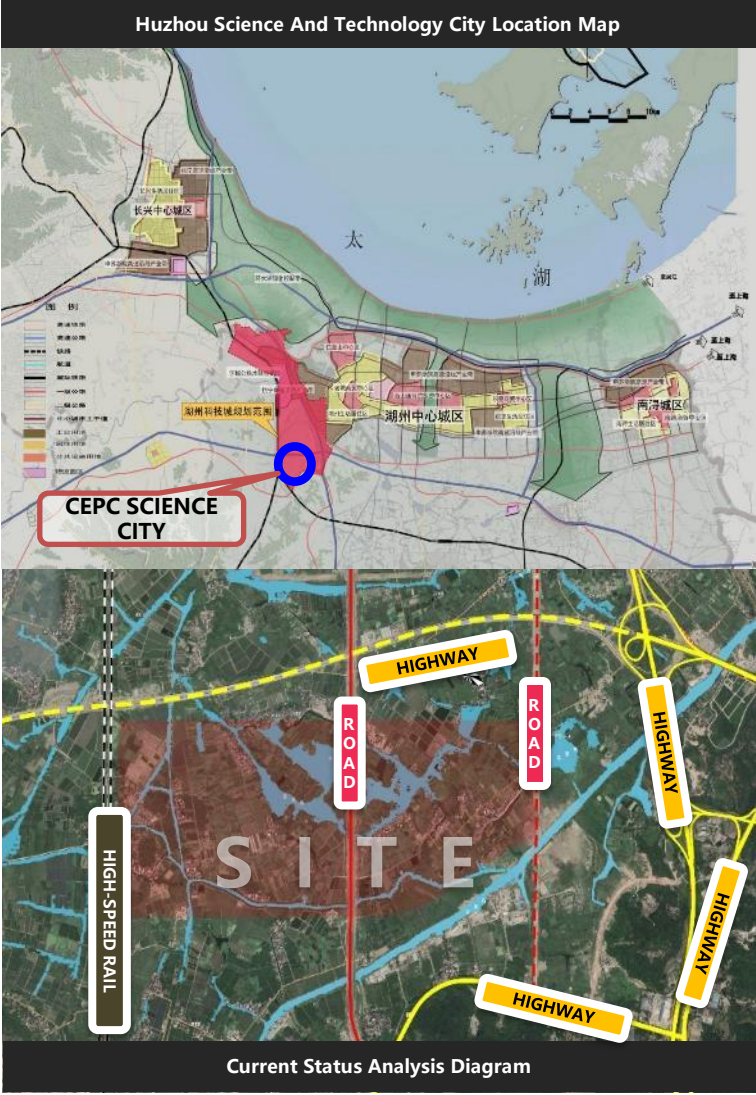
➤ Introduction to Hu Zhou Site



Layout of main underground caverns

➤ Introduction to Hu Zhou Site

International Science City



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➤ Construction conditions analysis

CEPC Site Selection evaluation criteria

What dose CEPC need?

- **Social conditions**
- Engineering conditions
- Science city conditions
- Ecological environment and land acquisition
- Facilitation for large-scale international community cooperation

| Influence Factor | Description |
|--------------------------|---|
| Social conditions | The impact of social and cultural conditions on the project, external boundary conditions related to the project, the environment, and soft power |
| National planning | National planning of the region |
| Regional conditions | Regional self-planning |
| Regional economy | Economic conditions, industrial planning |
| Cultural environment | Ecological environment and cultural atmosphere |
| Policy support | Government tendency and policy support |
| Social atmosphere | Local government and people's support, social atmosphere, public opinion on the project, and good conditions for the project normal operation in the future |
| Others | |

➤ Construction conditions analysis

CEPC Site Selection evaluation criteria

What dose CEPC need?

- Social conditions
- **Engineering conditions**
- Science city conditions
- Ecological environment and land acquisition
- Facilitation for large-scale international community cooperation

| Influence Factor | Description |
|---|--|
| Engineering construction and operation | The impact of natural conditions on the project, geographical conditions related to the site selection, construction, and operation of the project, and indicators of engineering technology |
| Climate | Hydroclimatic conditions |
| Transportation | Including water, land, and air transportation |
| Energy supply | Sufficient energy supply, green energy |
| Water supply | Sufficient water supply |
| Terrain geology | Terrain and geological conditions |
| Project costs | The influence of local transportation, materials, industry, etc. on project cost |
| Construction | Construction conditions, including water supply, power supply, traffic conditions, etc. during construction |

➤ Construction conditions analysis

CEPC Site Selection evaluation criteria

What dose CEPC need?

- Social conditions
- Engineering conditions
- **Science city conditions**
- **Ecological environment and land acquisition**
- Facilitation for large-scale international community cooperation

| Influence Factor | Description |
|---|--|
| Science City | The suitability of science city planning |
| Ecological environment and land acquisition | Eco-environmental protection influences and countermeasures, resettlement land acquisition influences and countermeasures |
| Ecosystem and resources | The influence of project construction on ecological environment and natural resources |
| Land acquisition | The influence of project construction on resettlement, the influence of science city construction on local residents moving in and out, etc. |

➤ Construction conditions analysis

CEPC Site Selection evaluation criteria

What dose CEPC need?

- Social conditions
- Engineering conditions
- Science city conditions
- Ecological environment and land acquisition
- **Facilitation for large-scale international community cooperation**

| Influence Factor | Description |
|---|--|
| Facilitation for large-scale international community cooperation | The suitability of science city planning |
| | |
| | |
| | |

➤ Construction conditions analysis

CEPC Site Selection evaluation criteria

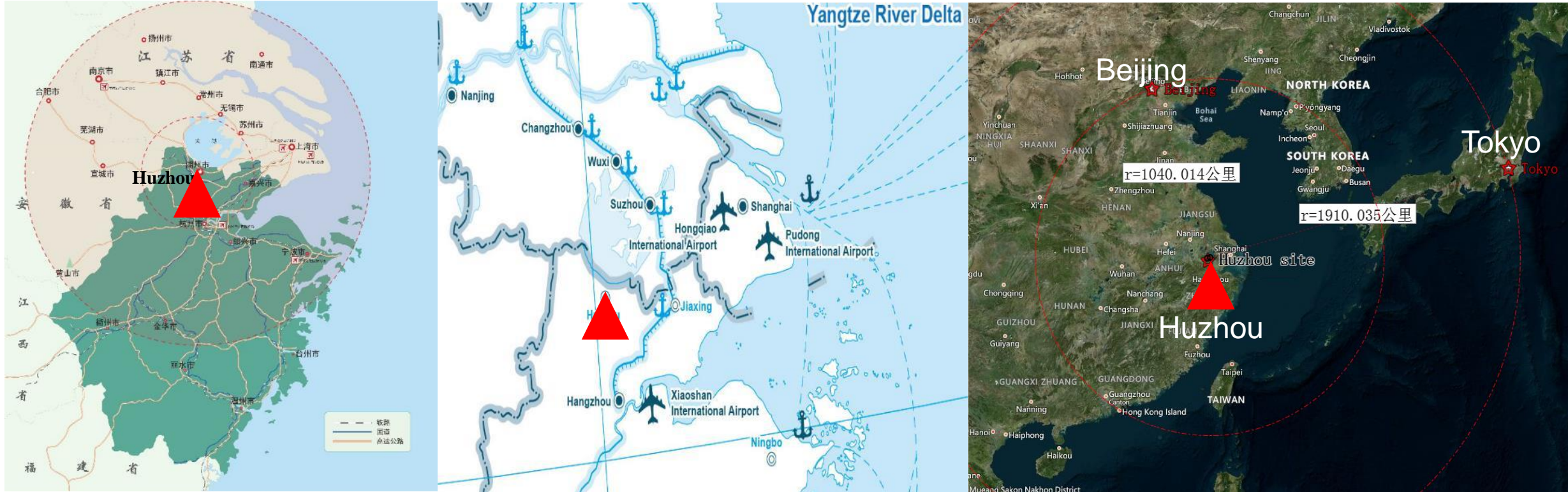
What dose CEPC bring?

- **Social and economic benefit evaluation**

| Influence Factor | Description |
|-------------------------|---|
| Scientific significance | The promotion to scientific research and the significance to local scientific and technological development |
| Technology spillover | The promotion to technology, industry, and economic development |
| Talent effect | The attraction and training of talents, including researchers, operation managers, etc. |
| Social effect | The promotion effect of national influence and regional influence, significance for international cooperation, science education, cultivation of innovative cultural atmosphere, etc. |
| Others | |

► Construction conditions analysis

Traffic conditions of Hu Zhou



Convenient transportation

Hu Zhou is 75km away from Hangzhou, 130km away from Shanghai, 1040km away from Beijing and 1910km away from Tokyo. It has international airports and international harbors.

► Construction conditions analysis

Traffic conditions of Hu Zhou

Highways:

S25, S11, S12,
S13, etc.

Railways:

high-speed railways to
Beijing, Shanghai,
Hangzhou and other cities.

Freight train station:

Shi-lai railway station:
is the material transfer station for Tian-huang-ping
pumped storage project.

Dense and well-connected highway and rail network



► Construction conditions analysis

Traffic conditions of Hu Zhou

Waterways:

Huzhou ports:

Direct access to the Yangtze River, the ocean, and the Beijing-Hangzhou Grand Canal.

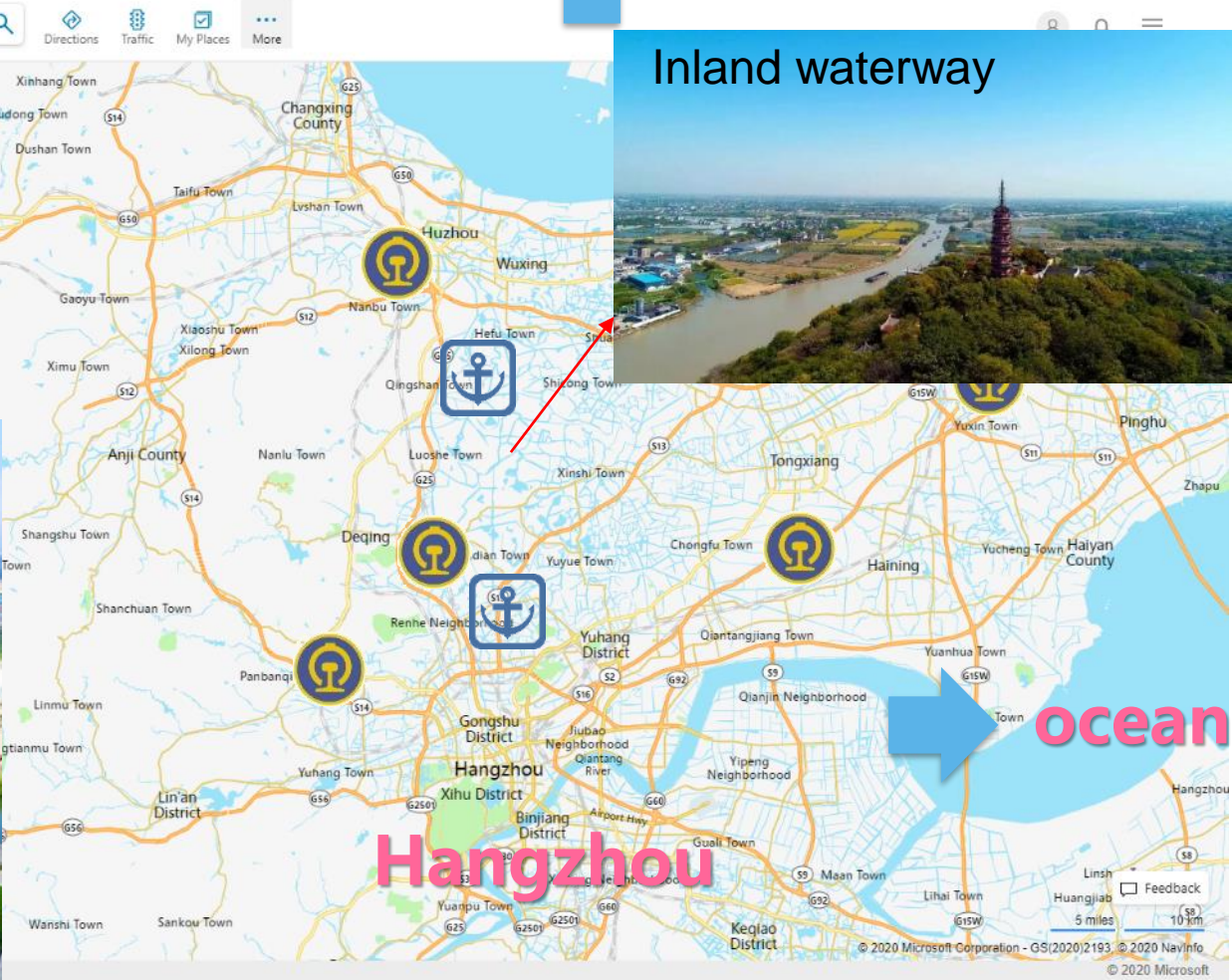
One of ports in Huzhou



Beijing



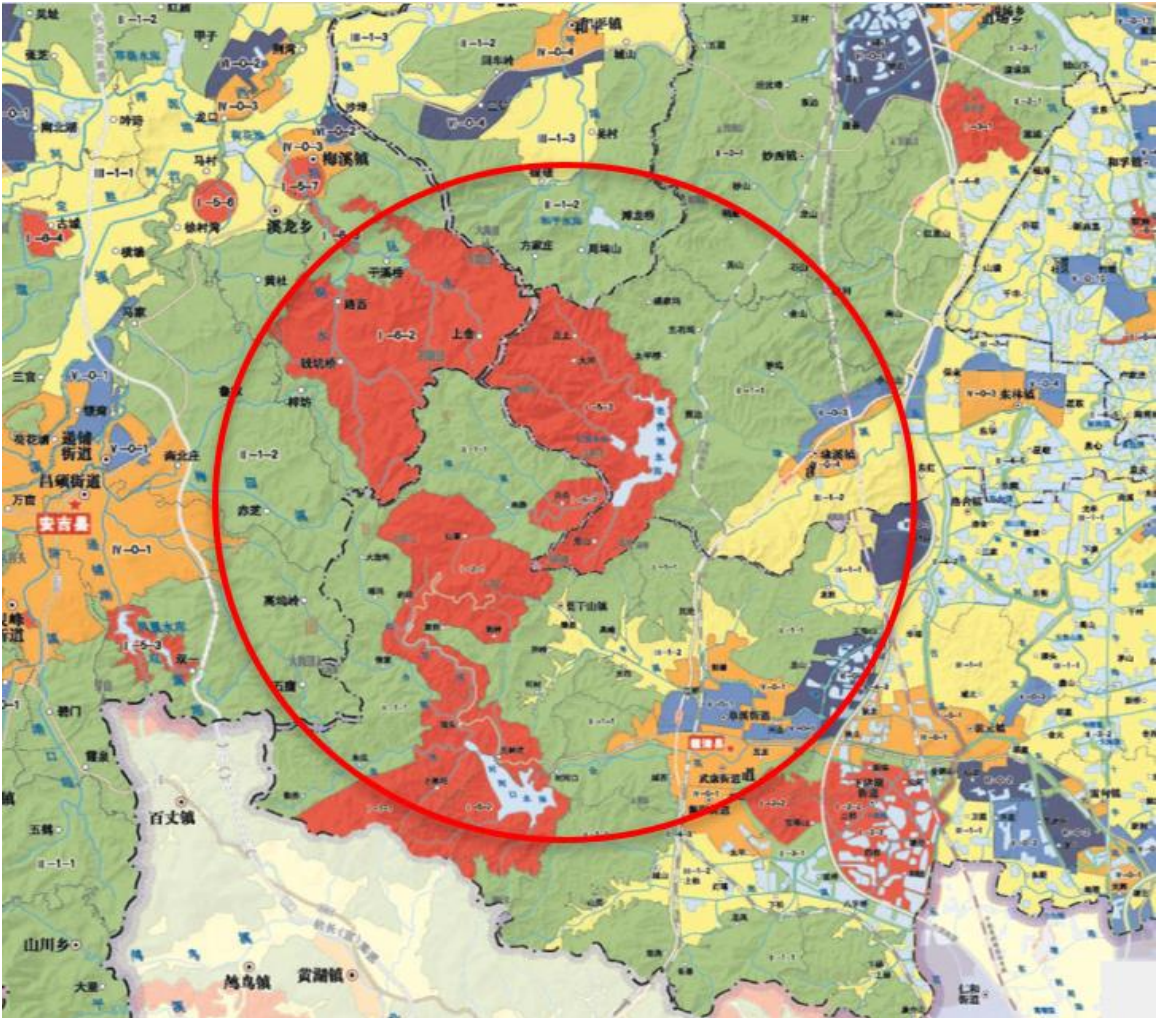
Inland waterway



Dense and well-connected waterway network

► Construction conditions analysis

Environmental Protection



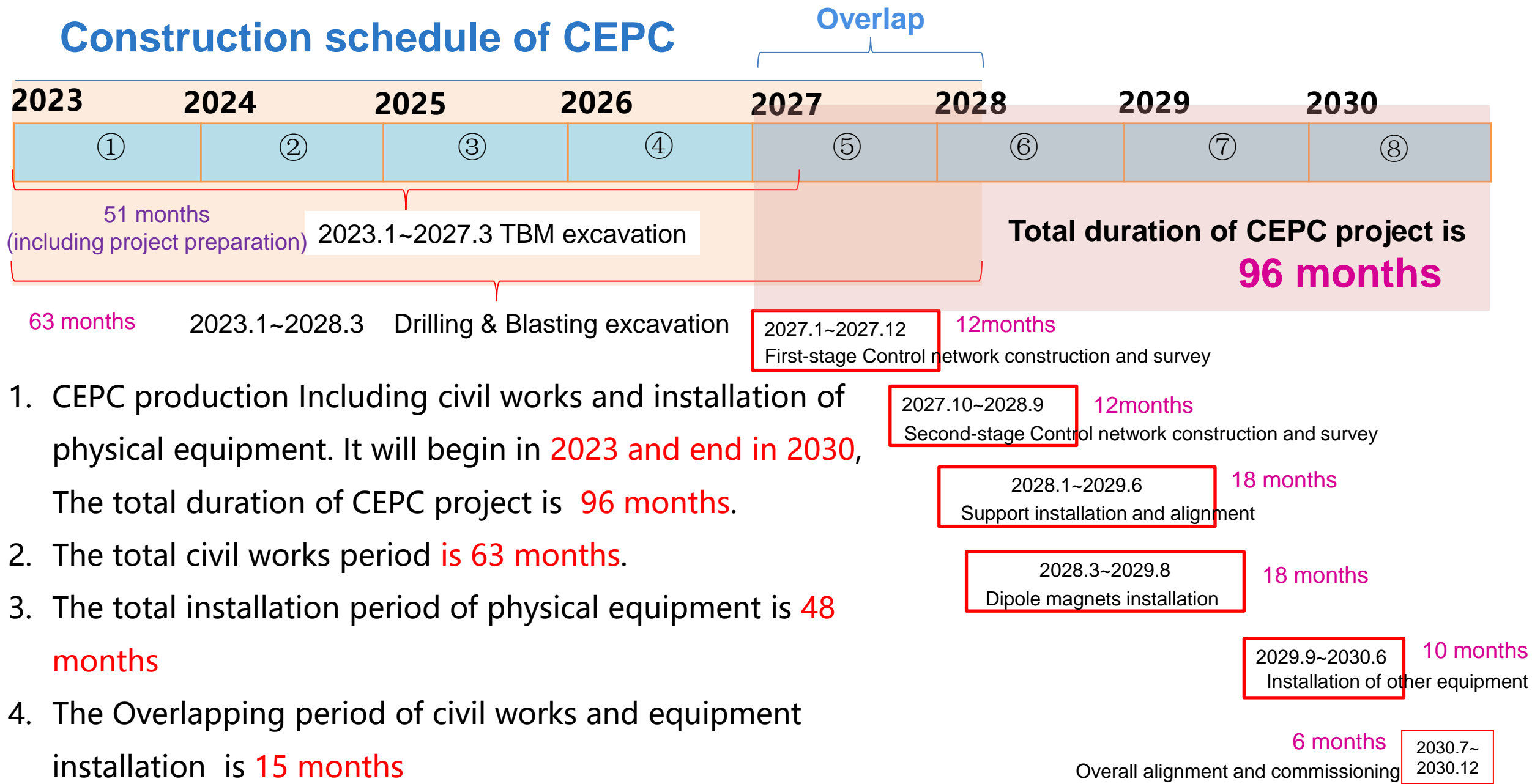
 Water source protection area

The project passes through the edge of the water source protection area, and the impact can be reduced and eliminated through engineering measures.

There are no constraints on the construction of project.

➤ Construction conditions analysis

Construction schedule of CEPC



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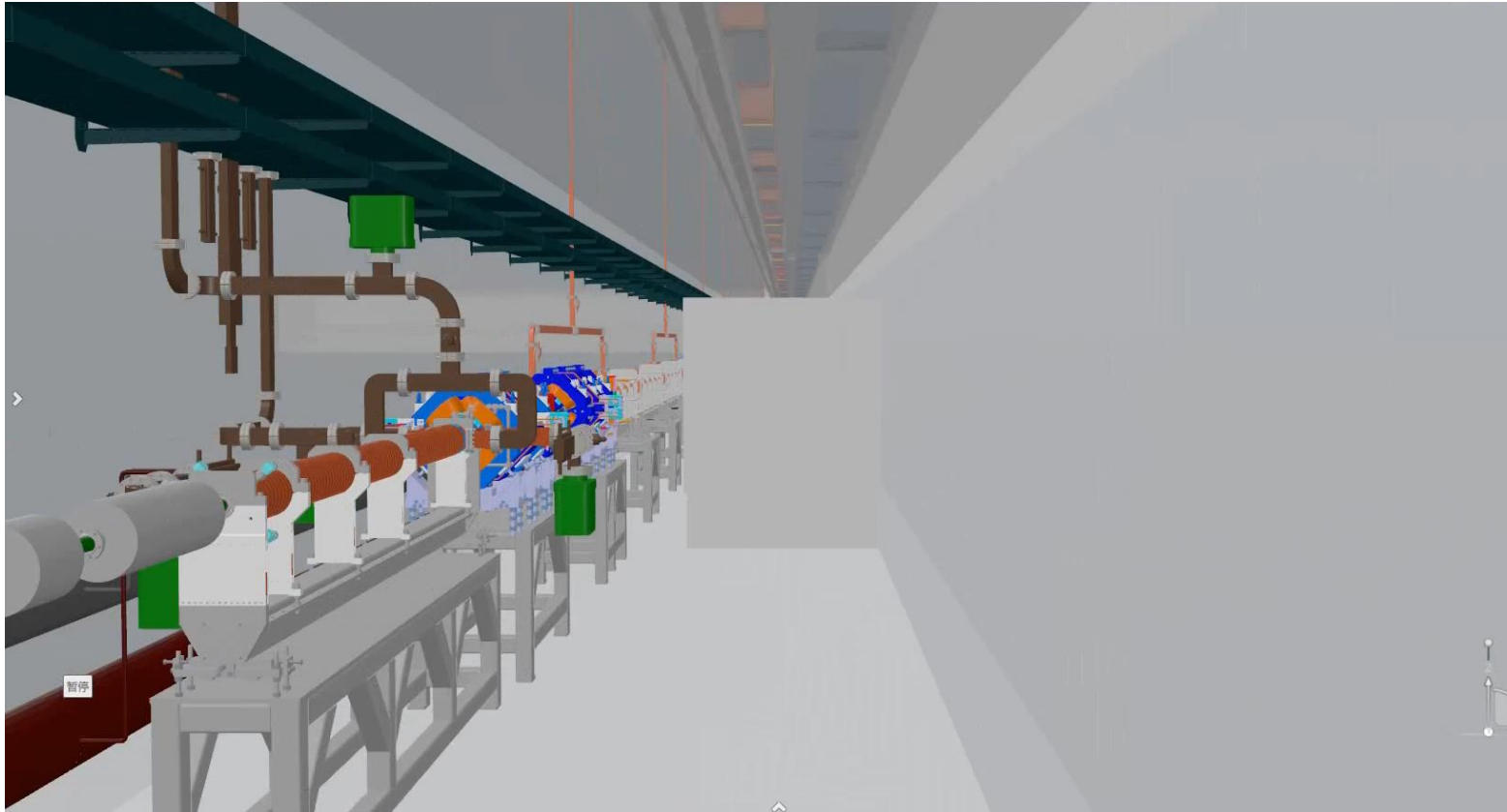
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► Project Digital Management

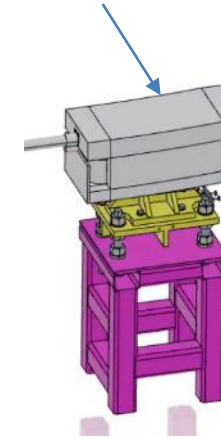
CEPC's Virtual Construction

Model updating

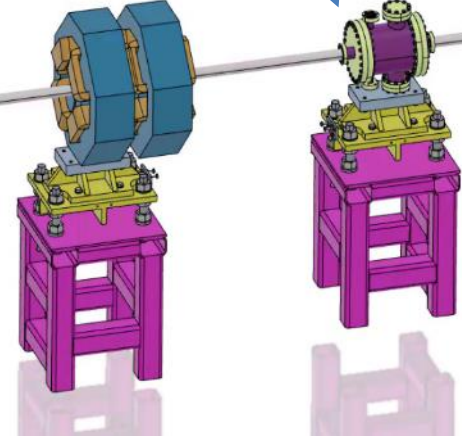
New equipment models were added to the final assembly model based on new research results, such as kicker, LSM magnet and dump.



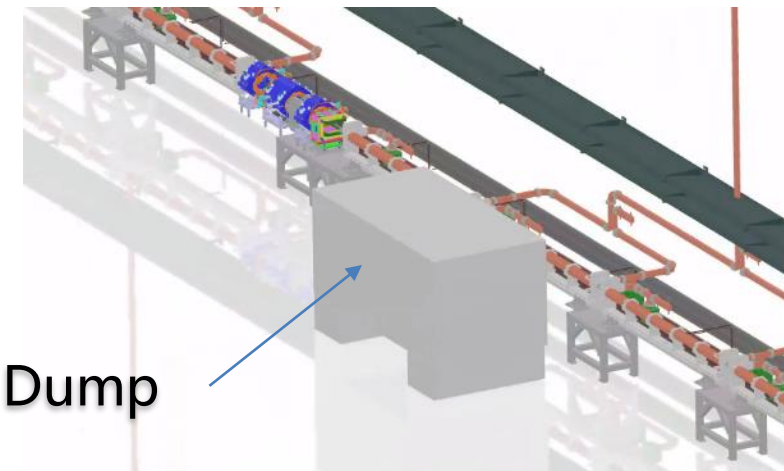
LSM magnet



kicker



Dump



► Project Digital Management

CEPC's Virtual Construction

Based on the final assembly model, some works are improved.

Virtual Reality

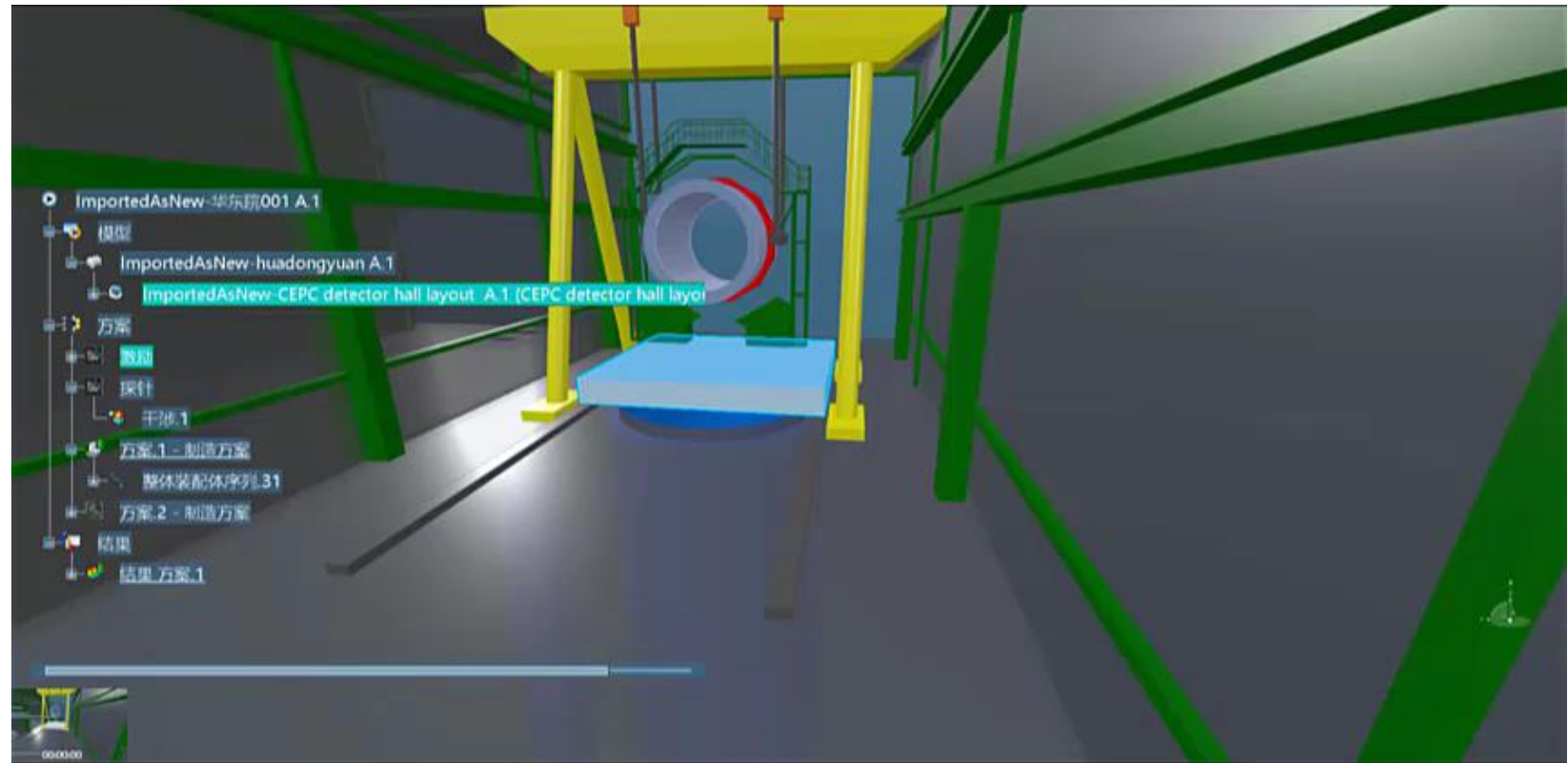
Virtual assembly of equipment in the experimental hall.

Naked Eye 3D Display

Some models have been tested.

Digital Display Platform

Initially formed BIM+GIS integration and lightweight display technology roadmaps.



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➤ Conclusion

- Based on the preliminary comprehensive analysis of multiple influencing factors, **the CEPC site selection in Huzhou has no constraints and the conditions in Huzhou are superior.**

由对多种影响因素的初步综合分析，湖州址无制约因素，并且条件优越。

- Relying on CEPC, research on **digital solutions for collaborative management** of multi-source and massive data **has produced rich results with obvious spillover benefits.**
依托CEPC，多源海量数据协同管理数字化解决方案研究已产生了丰富成果，溢出效益明显。

Wish CEPC settle in Huzhou, Yangtze River Delta early.

CIRCULAR ELECTRON-POSITRON COLLIDER



中国 · 湖州

CHINA · HUZHO



Thanks for your attention.