Study of Zhuhai Urban Design Process : Retrospection, Construction, Practice

Zhengtao Zhang
Director of Zhuhai Natural Resources and Planning Technology Center

Abstract

For many years, Zhuhai has been focusing on urban design and guiding urban construction. In 2017, the first batch of national urban design pilot cities was approved, which became an opportunity to promote the refined management and quality improvement of Zhuhai city.

The main purpose of this paper is to systematically set out Zhuhai's urban design work and practice in recent years, and summarize relevant management and control experience. This speech consists of four parts: one is to sort out Zhuhai's urban design practice history, compilation status, and current status of management and control; the other is to introduce Zhuhai's "Four Ones" urban design work content, corresponding to top-level design, management system, repair system, and informatization management and control system, systematic review and construction of Zhuhai's urban design work; the third is to summarize some of the highlights of Zhuhai's urban design work; the fourth is to introduce the practice of Zhuhai's urban design work through the case of Qinglv Road.

To begin, I would like to express my gratitude to the organisers of the Greater Bay Area Urban Design Conference for inviting me. On this occasion I wish to discuss the Study of Zhuhai Urban Design Process: Retrospection, Construction, Practise with you. The overall topic is also associated with parts of my job and some particular circumstances - including planning, organisation, urban design management, and ideas gained from work. Particularly the retrospections that Zhuhai has made regarding its previous urban design work in terms of urban design management and practises, after it was designated as a pilot city for urban design in 2017.

My speech today will include these 4 aspects:

1. An overview of Zhuhai;
2. The evolution of Zhuhai's urban design;
3. Zhuhai's explorations on urban design after being designated as an pilot urban design city
4. Zhujiang's urban design practises

To begin with, allow me to share with you certain background information about Zhuhai. It is situated on the coast of South China sea, facing Hong Kong to the east, and Macao to the south. In 1980, Zhuhai Special Economic Zone was established and has become the sole Chinese city immediately adjacent to both Hong Kong and Macao by land following the opening of the Hong Kong-Zhuhai-Macao Bridge for vehicle traffic in 2018.

Zhuhai is known as the 'City of a hundred Islands', and it covers a land area more than 6000 square kilometres. Zhuhai is between mountains and seas (see figure 1), and it creats an overall concept of the city that embraces moutains and seas, land and islands. Additionally, there is the overarching urban purpose of mountains and



Figure 1. The overall pattern of zhuhai mountain - sea - city

oceans embracing one another, as well as land and islands confronting one another. This contributes to Zhuhai's natural beauty and ecological basis.

As can be shown, there were already human civilisation sites in Zhuhai more than 4,000 years ago, when petroglyph of Baojing Bay rock painting started. In the second year of Tang Zhide (AD 757), Xiangshan Town was established. Since then, the Xiangshan culture, which has lasted for thousands of years, was initiated, making the Xiangshan Town an important channel for trade and cultural exchanges between the East and the West. Guangxu 35 years(1909), the Qing government created an international tax-free port in Zhuhai.

In 1929, Tang jia Zhongshan County in Zhuhai was created as a national model county, and the Zhongshan port and tax-free port plan were proposed, matching to a building concept for a southern port in Dr. Sun Yat-sen's foundation strategy. It can be observed that Zhuhai's urban development has continually been rooted in the surrounding water. Its urban construction also surrounds its eastern coastline region. As a result, the entire urban design of Zhuhai is centred on completing works along the entire eastern coastline region.

Please allow me to describe the urban design process in Zhuhai. In general, it may be split into four phases:

1 - The initial stage was one of basic spatial element control. We have been referring to the concept of ecological primacy in Zhuhai since the city's inception. Zhuhai has enacted a number of urban management laws and regulations relating to land disunity, urban development, and environmental protection since 1991. For instance, the most recent rules outlining 8 environmental restrictions, specify that no structure may be constructed above the 20 metre contour line or within 80m of a mountain or 120m of a body of water. Additionally, polluting businesses are prohibited from entering Zhuhai, creating a system to protect the integrity of Zhuhai's whole environment.

2 - The second phase is typical; it is a design stage for urban lots. This phase is primarily focused on the 2013 publication of the fourth version of the general rules. Additionally, we completed some specialised urban design work at the regional level and in key regions, with the goal of standardising the control content and expression form of urban design. We completed over 50 urban design projects across the high-tech zone, Shizimen Central Business District in Hengqin new area, and Zhuhai's western urban district.

3 - The third phase is the project for a living urban environment, which is the people-oriented initiative we previously discussed, namely the effort to build a liveable environment in Zhuhai. As seen in our image, the whole of Lovers' Road and the eastern coast were encircled with transit, hotels, and cultural public spaces. Then we launched almost 40 initiatives. The second objective is to place an emphasis on the implementation of novel concepts. Indeed, in 2013, we commissioned Peter Calthorpe to execute

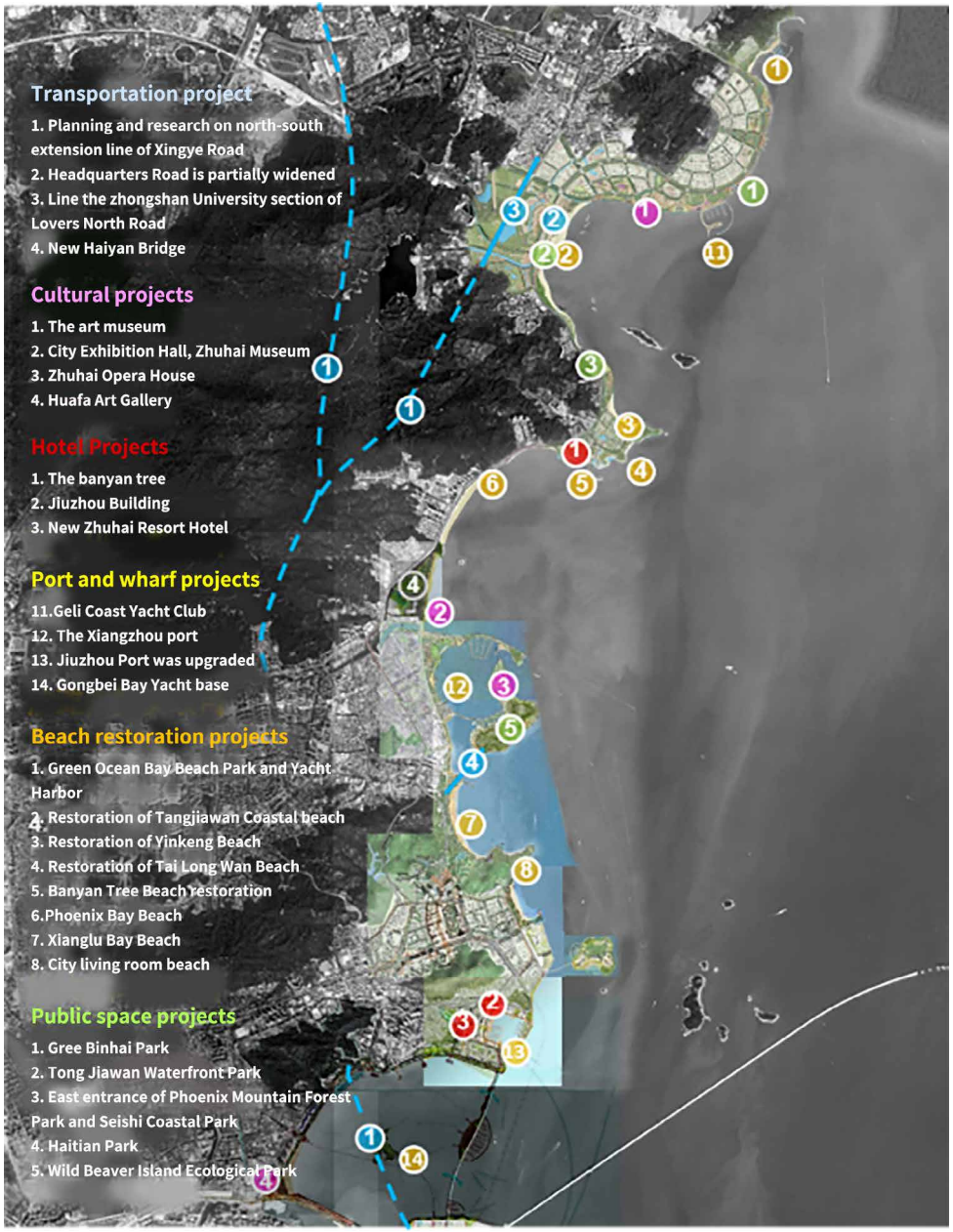


Figure 2. Improve the level of urban design around environmental livable projects

the idea of tiny block networks in the high-tech zone's rear ring region. Finally, we focused on implementing urban design outcomes and establishing a control mechanism. We proposed the need of urban design in the form of management and control through management units and extra plans during the process of urban development in Hengqin.

4 - The fourth phase is the development of a thorough promotion strategy. At this level of systematic urban design, it is necessary to do comprehensive urban design work in response to the requirements of the Urban Work Conference. In October 2016, Zhuhai held an Urban Work Conference, during which it became clear that the city needed to strengthen urban design work, during which 'double repairs' (urban regeneration and ecological restoration) should be further promoted, and finally establish an urban design system that is compatible with urban and rural planning in order to further improve the city's image.

Of course, Zhuhai is also confronted with new challenges in its urban design efforts. The first point is that in 2017, Zhuhai was designated as the first batch of pilot cities for urban design. We suggested at the time to do pilot work in four areas: innovation in management systems and technology; institutional approaches exploration; preserving history and culture; and enhancing the city's quality. The following sections cover some particular explorations. Additionally, our study is an investigation of this management system and its technological techniques.

The second point of Zhuhai's unique reality is that in 2017 and 2018, the city was struck by typhoons Hato and Mankhut. At the time the whole city's structures, as well as certain infrastructure including trees, were severely destroyed, necessitating immediate post-disaster rebuilding work to restore the city's quality. At the time, we desired to enhance the whole urban design system through our post-disaster rebuilding efforts. This goal proposed stricter standards for the whole of Zhuhai's urban design work.

Thirdly, we must carry out General Secretary Xi's directive that urban administration must be detailed focused, such as planting flowers. At the time, the Zhuhai Municipal Party Committee and municipal government developed a series of plans for urban refinement and quality improvement, including the "One Plus Seven" action for the 2018 airshow, the twentieth anniversary of Macao's return to China in 1900, and some requirements for comprehensive improvement beyond 2020.

Of course, during the process of urban design, we have included summaries of our work where we highlighted some actual obstacles, namely in the following areas. The capacity for regional difference in administration and control necessitate precise strategies, particularly in the case of Zhuhai. The primary ones are islands, since Zhuhai has a total of 264 islands. This regional structure is diametrically opposed to the city and island areas, where control needs are stringent. Design goals are always evolving, but advice for this kind of physical space building

is still trailing behind. We worked on general urban design and then developed a vision for spatial development and created the framework for such management. However, some criteria about the application of macro design to this micro plot remain unsatisfied. A shortage of material resources exists, particularly as the content of urban design guidelines continues to grow. We wanted to investigate these broad concepts, these design needs, and then make it easier to execute this planned management. The final element is administration and control of urban areas. Continuous investment is required to convert into refinement and intelligence.

The following page discusses many elements of Zhuhai's exploration since it was designated as a pilot city for urban design. To summarise, it consists of two components: "One Plus Five" - where the "one" is a high-level design framework with five critical tasks: (see figure 3)

The first task is to create the framework for the top-level design. System construction, technical innovation, management innovation, professional control, and collaborative creation are the five facets. That is where we began the following five missions. The next slide, the five critical tasks, is to create a guide to urban design and to construct a plan. This is a three-tiered compilation system, from the broad level to the key area level and the key plot level, all of which are related to planning. It defines the various kinds and classifications of urban design control at all levels, as well as the criteria for technical advice compilation. We also put forth the urban design plan of important locations, as

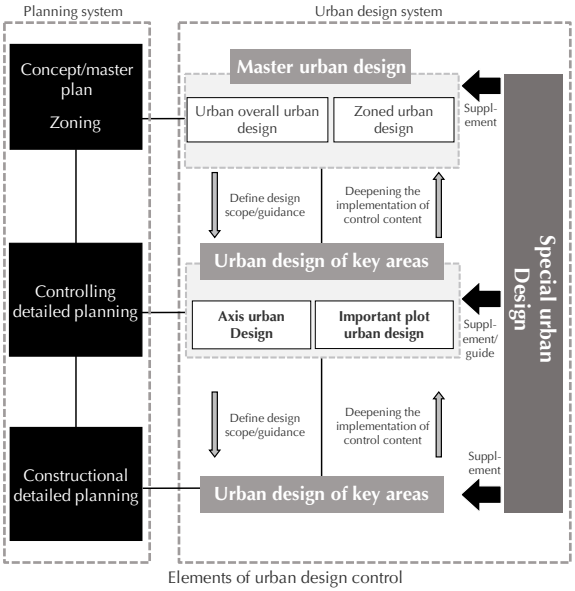


Figure 3. Formulate Guidelines for Urban Design compilation of Zhuhai city

well as control components and expression needs. We also sorted out the control components spanning 128 layers of design in seven categories of all levels, and standardised the implementation management processes according to the needs of urban design management. This is the important point, the content of the digital storage of this accomplishment, and then the creation of the digital control platform for the future course design, creating a foundation.

The second element is to create a flawless repair system of urban design. Under the management framework of the overall urban design, we utilised big data to evaluate the current planning and urban aim, and then selected the main high-frequency locations in Zhuhai. The

evolution of my work is multi-dimensional. This multi-dimensional data, multi-source data is an assessment technique that detects the visual structure of the city from the bottom up. Subsequently, we integrated the top-down planning revision, such as general regulations, general regulations, and environmental improvement planning, to create the main elements of Zhuhai's urban space optimisation. On this premise, we bring forth the overall city picture system of ten regional three-level nodes, five horizontal, four vertical and multi-path. Then, we refine the city picture to the particular zoning level. The assessment of urban space quality is split into three categories and 46 critical areas according to the '80-20 concept'. This is also for the broad needs of the following urban design standards to make some demarcation of the scope, and detailed to the particular project library, to guarantee a landing of urban design.

The third task is to establish uniform guidelines for urban design as a document for standards control, and then there are criteria for management staff. Using such basic criteria, we created six core control components; designated six kinds of blocks, six types of style zones and 13 types of characteristic regions; put forth general requirements for the overall level and other types of design elements; and set up baseline control.

The fourth objective is to create a digital design control platform. Zhuhai has made various efforts and investigations in this area, and has established a rule foundation for unified hierarchical urban design behaviour. This illustration demonstrates that Zhuhai is engaged in layer design. For instance, layer design accomplishment management may handle the whole hierarchy of various zones and levels, as well as the associated statistics and data calls. Then, digitalisation assists with statistical query, programme evaluation, land use circumstances, and decision-making aid, whilst also increasing management efficiency and technical capability. Additionally, we developed a three-dimensional integrated control platform for urban design, resulting in the creation of a digital sandbox for urban planning, as shown in the picture, to help with project accomplishment, intelligent evaluation, and auxiliary decision making.

Fifth, we examined the "Regional City Chief Designer" system. We tracked the dynamic process through which urban design is implemented. The adjacent Hengqin Integrated Area also includes a river and two belts that serve as a connector for our public space design; the twin cities are located in a river valley. We asked Professor Wang from South China University of Technology to be the Chief Engineer of Urban Design for Hengqin when the Chief Engineer System was implemented. Several projects have been evaluated by the Chief Engineer and included into the plan at the request of the coordinators to guarantee their execution.

In the last section, I'd like to offer some tangible examples of Zhuhai's commitment to urban design and guidance throughout urban development. As stated before, Zhuhai's urban growth has always been centred on the seaside regions, which is analogous to the development of the

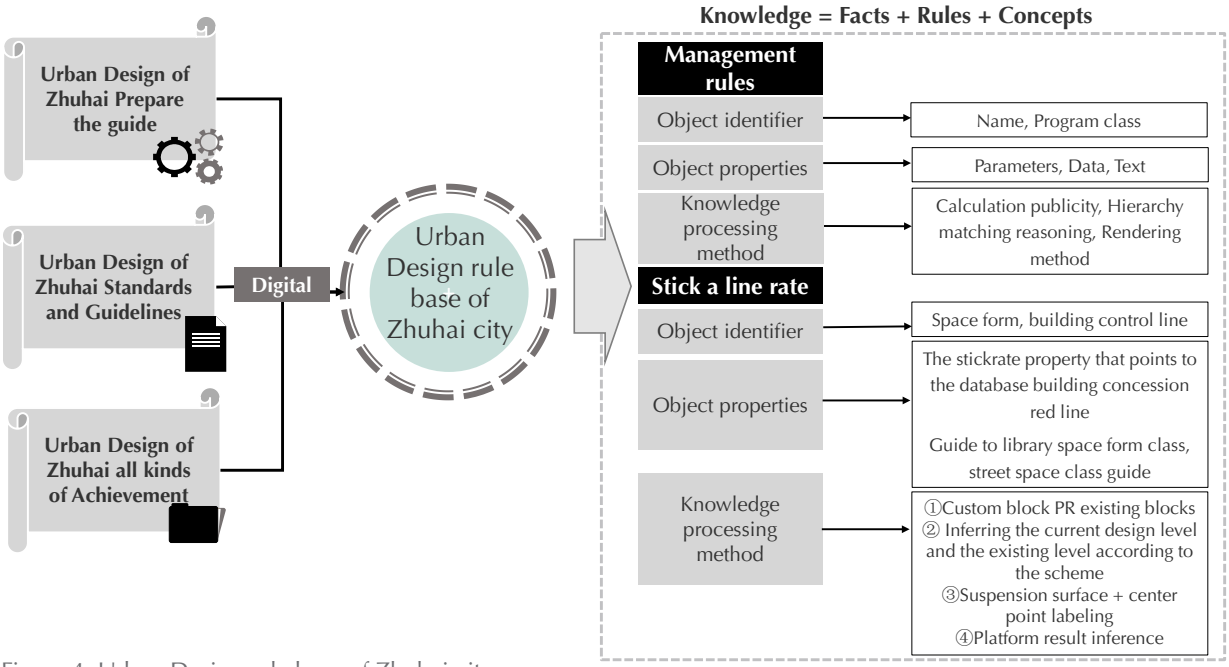


Figure 4. Urban Design rule base of Zhuhai city

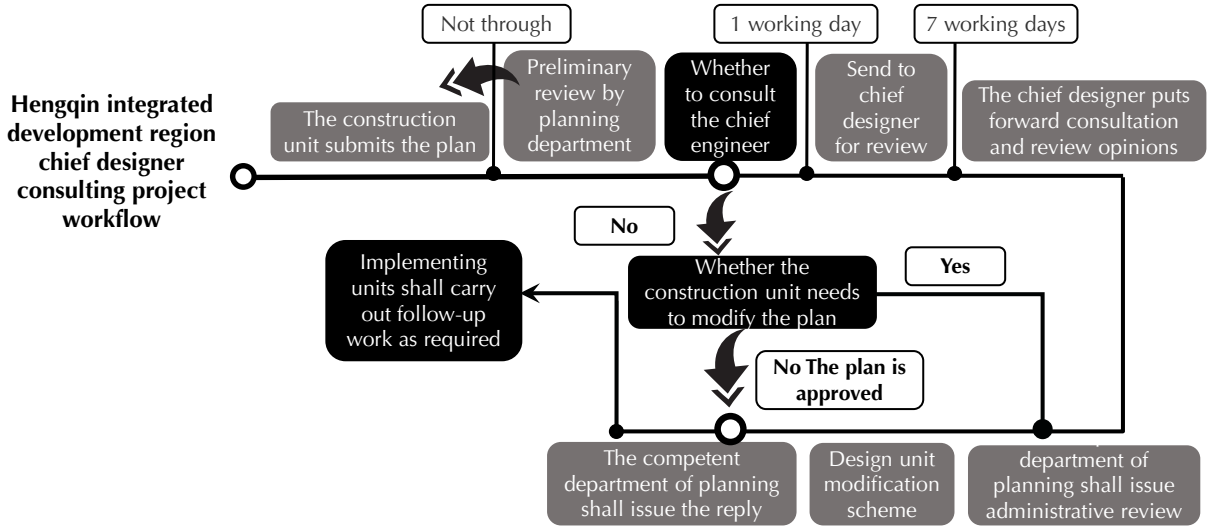


Figure 5. Hengqin integrated development region chief designer consulting project workflow

Lovers' Road, a promenade that links up many of the city's main attractions (see figure 6). The development of Zhuhai has been accompanied by the building and rehabilitation of the urban bay during the last three decades. The region that connects the whole coastline area is the entire Qinghai Lovers' Road, which is a smaller version of Zhuhai's urban growth.

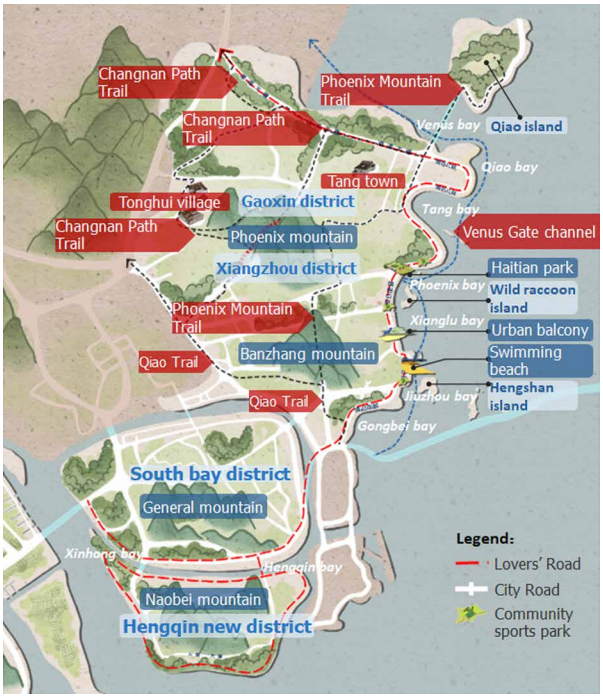


Figure 6. Lovers road and Zhuhai development

The establishment of a waterless port at Xiangzhou in 1909 and Sun Yat-sen's concept of a great southern port in 1929 were both significant milestones in the formation of the Lovers' Road and the evolution of Zhuhai City's design. This is a significant representation, linking significant sections of the natural environment, such as Xiangzhou District Hengqin and Gaoxin, as well as certain public spaces and key resources of historical and cultural nodes. One might argue that Zhuhai's urban design approach is inextricably linked to Lovers' Road. Following that, let us discuss Zhuhai's practises throughout this time period from three perspectives. Many facets of the effort to enhance the urban environment can be discussed.

The first step is to shape the area next to the Qinglü Road. Take the Phoenix Hill Skywalk as an example, where we built an 8.6-kilometre long aerial boardwalk, helping people gain access to mountains and the sea. Additionally, the Xianglu Bay Park has coastline nodes and cultural viewing areas that provide a wonderful sea view. The construction of Xiangshan Lake is almost complete and the site is now ready for development. Banzhang Mountain's access road reaches a height of 160 to 180 metres - this creates the path around the mountain. The sea view's development is currently almost complete, and it is scheduled to open to the public by the end of 2021.

The following is a proposal for the urban design of many major regions, including Hengqin New Area and Bonded Area. The Hongwan area is Zhuhai's central business district. The building of this new facility in Zhuhai was made possible by a concerted effort to secure complementary resources. The second objective is to investigate Zhuhai's skyline, which is reminiscent of the city's international convention and exhibition centre. This is applicable to the whole integrat-

ed region. The new skyline's general design may reinforce the two sides' effective connection, create a fusion of interacting relationships, and shape a suitable landscape interface. Indeed, Macao is located east of the urban interface. At the moment, a few physical markers have been established there. On both sides of the river, we're planning to recreate a typical urban scene of two banks along one river. The next picture shows what the whole Shimen region looks like if you take a view from the Macau Tower. (see figure 7)

This is followed by Zhuhai's Hengqin Financial Island region, which is also included in the integrated area. This area is referred to as the eastern core. Here, many landmark structures have been built in line with the criteria of the Chief Urban Designer.

The following project is the integrated design of Zhuhai and Wanchai district. This master urban design plan encompasses an area of 198 hectares, which stands face to face with Macau across the Haojiang River. (see figure 8) It is part of the extension project of Zhuhai's overall urban design.ban design.



Figure 7. View from the Macau Tower



Figure 8. Bay Area Urban Design



Figure 9. Urban balcony



Figure 10. Urban balcony 2

As you can see from this photograph, the whole region is Macau. Then the critical public area is constructed, complete with the Xiangzhou Port. Then it's the construction of a public space near Zhuhai hospital. This kind of public space is primarily centred around people. We built this

compound leisure area by combining it with the seaside boardwalk. This region is home to Zhuhai's 'urban balcony' project, which spans 38 hectares.(see figure 9) It penetrates this terrain's barrier and links the beach to Xianglu Bay, creating a topography that connects mountains to the sea. The project is now under development and the first phase will be finished in the next few months.

Additionally, Haitian Park in Zhuhai was planned, as was the general design for this whole complex for commercial, residential and living purposes. The 'Haitian Posthose' building actively improves the community's space, including the Shishi Mountain North Community's participation in planning. Residents engage in community planning to ensure that participatory building practises are carried out.

These are only a few of the current initiatives. The following article is about the development of a community sports park in Zhuhai. Since 2012, around 100 community sports parks have been constructed across Zhuhai. Additionally, the building and development of many livelihood initiatives have garnered national and regional innovation awards. Numerous community sports areas constructed along Lovers' Road provide locations for people to engage in everyday activities.



Figure 11. Xiangzhou Bay