

5.3 Land Development

For more than 20 years, PUJEN has built a solid reputation of a company that produces high-quality residential housing. Instead of giving in to the high volume, fast profit business model, PUJEN believes that a residential unit should be built at a solid pace to create a space where a family can feel safe and live happily. From the introduction of building information modeling (BIM), building structure inspections, follow-up building inspections, and continuous learning of new methodologies, new equipment, new materials, and LEED and FITWELL certification, to green building, smart building, and the application of all-age housing, PUJEN hopes to continue the current development of society and lead Taiwan to align with the global trends, moving toward a low-carbon city.

Thus, PUJEN Land Development is committed to creating a building that can communicate with nature, coexist with the environment, co-prosper with the land while resonating with the beauty.

▼ 5.3.1 Construction Partner Selection and Management

Selecting a good partner is crucial to the construction process and the quality of the finished product. Thus, PUJEN takes into consideration the safety management of the construction site as well as quality and capability. The overall management process is divided into three main stages: i) pre-contract project evaluation, ii) construction oversight, and iii) maintenance and management after practical completion and handover. Before outsourcing to the construction partner, three or four professional construction companies, in principle, are invited to conduct a pre-construction evaluation and on-site visits to the designated site based on PUJEN's evaluation criteria to better understand the on-site management and construction quality. Then the PUJEN's project supervisor and the site manager would select the appropriate partners to outsource. When the project enters the construction phase, an on-site supervisor will be arranged to conduct site safety spot checks or inspections at any time to ensure safety practices are carried out. PUJEN hopes to create an accident-free and disaster-free construction site.

▼ 5.3.2 Industry and Academia Collaboration

When it comes to the construction industry, also a traditional industry, workers built houses normally based on technique passed down by the experienced or those written documents in the past, so they have less connection to new technology and new ideas. However, PUJEN Land Development was established in pursuit of building an ideal and practical house. To us, we are not simply building a house, but we keep trying to put technology into our final work. We also cooperated with academic institutes for research during the construction period. Then we gained some positive results from those industry and collaborations

Revisiting those past industry-academia collaboration projects performed by PUJEN, such as all-age Housing, Building Information Modeling (BIM), Earthquake Early Warning System (EEWS), Structural health monitoring (SHM), all of these projects capitalized on the power of technology and research to make architecture better and also let us know still more applications yet to be used. These two elements will grow stronger and closer with each other.

PUJEN Land Development has been working with Chinese Taipei Geotechnical Society (CTGS) since 2019, bringing in the design consultant and the construction unit of CMP Midtown to conduct research on two sub-projects: attributes of gravel formation and smart dewatering. Corresponding tests and monitoring are conducted along the project to collect a large and comprehensive set of stratigraphic data for raw data analysis. We expect this strong team to achieve exemplary collaboration between "industry" and "academia" where the industry understands the attributes of gravel formation better through academic research. The team has combined construction engineering and technology to create the first automated pumping monitoring method, using automated monitoring equipment, pumping machine control system, IoT and big data analysis to lessen water extraction effectively while saving electricity and other overheads as well as reducing carbon emissions.

▼ 5.3.3 Introduction of the Building Information Modeling (BIM)

Building Information Model (BIM) is a new technology management system for communication and coordination for construction projects that include the planning, design, construction, operation, and maintenance of the entire construction life cycle. BIM utilizes the digitalized 3D models to generate digital representations of geometric components of physical objects (such as beams, columns, slabs, walls, stairs, doors, and windows), relative positions of the geometric components in the space, number of objects, and their characteristics (such as color and material) to facilitate the information exchange and integration between professionals and fill the gap in traditional 2D-based model construction projects. The most critical aspect of “BIM” is the word “I—Information” symbolizing the information of building life cycle management and application.

1/ Planning and Design Phase D-BIM ²⁸	2/ Construction Phase C-BIM	3/ Building Use Phase FM-BIM
Design Inspection	Construction Oversight/ Construction Project Management	Property assets / facility management / operation and maintenance management
Conduct reviews when the architect or PUJEN is drawing in the early phase of design	The construction and the electromechanical contractors focus on the review of collision during the construction	Establish a service platform for information utilization of each project

• Establishment of the building industrial management platform

- In 2019, PUJEN Land Development set up a customized “after-sales service management platform”. Through real-time information and services provided by the platform, PUJEN can enhance the convenience and customer satisfaction of residents and property management units, thereby improving the Group’s brand value.
- PUJEN has set up an after-sales service management platform based on its internal repairing service and made online forms for each stage of operation based on the operating procedure of each department in order to assist the company in controlling the quality and timing of customer after-sales service in real time.

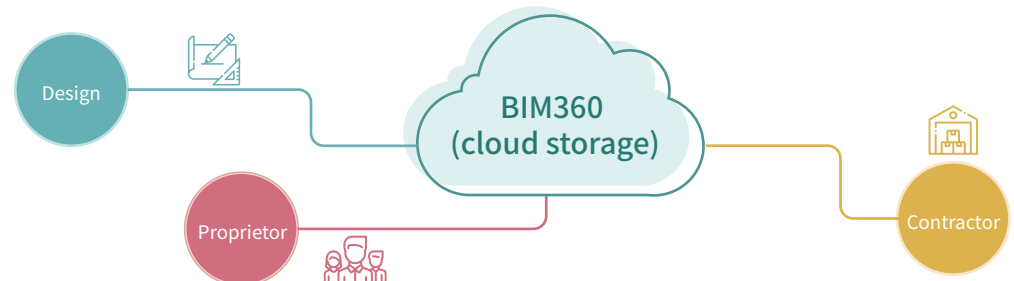


• Across-the-board Learning

In 2021, the Construction Engineering Department conducted internal training courses three times a month, in which BIM application to cost estimation was primary whereas BIM360 application and establishment was secondary.

Autodesk BIM 360 includes a series of cloud services, facilitating users to easily access BIM information anytime and anywhere during the project preparation process. It mainly performs management, collaboration, communication, and other operations for buildings in engineering projects which adopt BIM (REVIT) software. In addition, through cloud platform, project personnel can comprehensively manage the BIM of projects with no geographical and time constraints and maximize the effectiveness of BIM.

Cloud services support a multi-functional collaboration, including model arrangement and intelligent object data exchange, which changes how architects, engineers, contractors, and owners collaborate, manage, and release the information of building and civil engineering infrastructure in a real-time basis.



• BIM360 - Application by PUJEN

In general, D-BIM shall be drawn by the architect who does it via BIM. However, the practice is yet to be widely adopted. Therefore, PUJEN has launched across-the-board BIM learning. Personnel of the Building Construction Department have started drawing 3D modeling layout based on the 2D modeling layout in some projects, then conducting layout reviews and giving feedback to the architect for further adjustments. At the same time, project personnel can understand that the progress of modeling layout can be in sync. The BIM planned, designed and established in the early stages of the case is then applied to the research and development of cost estimation for the case.

In 2022, PUJEN continued to the implementation and data establishment of D-BIM. The BIM team from the Building Construction Department would review, allocate and plan for BIM drawings of individual case based on work content



2D Engineering Drawing

Design Division

Build columns, beams, sheets, walls
Build elevators, doors, windows
Build balconies, exterior wall panels
→Propose structure models

Construction Engineering Division

Build interior drywalls
Build interior doors and windows
→Propose structure models



BIM 3D Modeling



Model Integration

Electromechanical Division

Build five major pipelines
Install important equipment for the building
→Propose CSD models

Construction Management & Customer Service Division

Install equipment in the kitchen and bathroom
Build the ceiling, floor, and walls for the kitchen and bathroom
→Propose the model of kitchen and bathroom



Give Feedback to Design Unit

Concerns in drawing

Not compliant with laws Elevation check
Omissions & contradictions Design quality



Produce Shop Drawing Based on Model

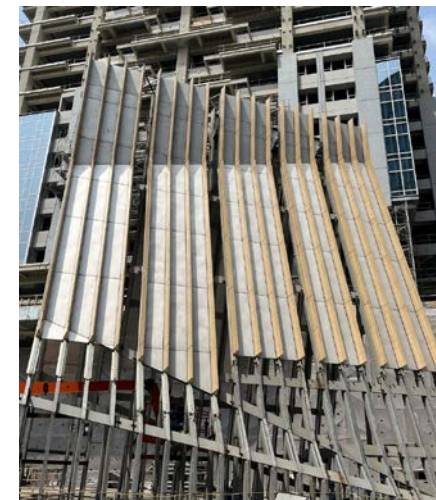
In the case of CMP Midtown in 2022, the style of the church and art gallery beyond the residential building and hotel was very unique. For its irregular shape (the church facade and the floors of the art gallery were both folded), we used BIM models to help construction personnel understand the overall design concept and reduce time needed to review the construction drawings. During the construction review, it facilitates visual reviews of the construction interfaces, reduces possible conflicts during construction, and facilitates the use of the model to review the construction process. Each unit is pre-cast at the factory and delivered directly to the site for hoisting and assembly. We can thus effectively control the construction schedule and maintain a neat and clean construction site.



▲ Digital model, Unit disassembly



▲ Transport review, Lifting review



▲ Use BIM to review the results of the church construction

Implementing the BIM: Timeline, Progress, and Results



		Water Residence (Completed)	PUJEN Yiyi (Completed)	PUJEN Zuo (Completed)	CMPJ Residence de l'aqua (Completed)	Ching-Geng Yanji (Completed)	PUJEN Yangmu (Completed)	CMP Midtown (In Progress)	PUJEN Yongji (Completed)	Park Mansion (Completed)	Beautiful Harmony (In Progress)	GLORIOUS (In Progress)	Zhongshan Art Mansion (In Progress)	PURE WISHES (In Progress)	Wenlin N Road Project (In Progress)	VISION UTMOST (In Progress)	SERENITY OF NATURE (Pre-sale)	THE ELITE (Pre-sale)
BIM Introduction	D-BIM	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
	C-BIM				•	•	•	•										
	FM-BIM	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

▼ 5.3.4 Development of Low Carbon Cities

Escalating climate change has led to more discussions over carbon reduction in recent years. Tens of thousands of buildings are the cornerstone to each city. If buildings can lower down the negative impact on the natural environment through the whole procedure of construction, it will bring a substantial benefit to cities regarding the overall carbon reduction. PUJEN has long promoted and implemented a long-term carbon reduction plan throughout the life cycle of residential buildings. At the design stage of each construction project, PUJEN has all introduced the concept of low carbon building. Through building construction, PUJEN spares no efforts to give the considerable momentum to the development of low carbon city in Taiwan.

Since its inception, PUJEN Land Development has introduced the concept of sustainable design and pro-actively promoted green building design and planning. With the regulations of “Green Building Label”, a series of processes of building green construction from construction material production, building design and planning, construction phase, use, management to demolition, have included four aspects of our daily life: ecology, energy saving, waste reduction, and health.

Starting from 2022, we will introduce carbon footprint assessment for the construction industry for new development projects and urban renewal cases that are expected to obtain the Green Building Label or Smart Building Label, with the goal of obtaining the LCBA (Low Carbon Building Alliance) Construction Carbon Footprint Certification at the design permit stage.

		CMPJ Residence de l'aqua (Completed)	Ching- Geng Yanji (Completed)	PUJEN Yangmu (Completed)	CMP Midtown (In Progress)	PUJEN Yongji (Completed)	Park Mansion (Completed)	Beautiful Harmony (In Progress)	GLORIOUS (In Progress)	Zhongshan Art Mansion (In Progress)	PURE WISHES (In Progress)	Wenlin N Road Project (In Progress)	VISION UTMOST (In Progress)	SERENITY OF NATURE (Pre-sale)	THE ELITE (Pre-sale)
Energy Conservation	High Efficiency LED Lighting	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Thermal Control Lighting	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	VFD Air Conditioner	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	VFD Speed Regulator	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Appliance with Energy and Water Conservation Label	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Energy Recycling	Heat Pump Hot Water System	●			●								●		
	Rainwater Reuse	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Clean Energy	Solar Power	●			●						●	●	●		●
Intelligent Monitoring	Energy usage monitoring (digitalized electric and gas meters)	●			●								●		
	Automated Lighting	●			●								●		
	Automatic Control based on Power Factor	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Sensor and Automatic Sprinkler	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Green Transportation	Low carbon parking spots (electric cars/motorcycles/bicycles)		Charging equipment, installed and reserved	Charging equipment, installed and reserved	ubike / charging power reserved	Charging equipment, installed and reserved	charging power reserved	Charging equipment, installed and reserved	charging power reserved	Charging equipment, installed and reserved	Charging equipment, installed and reserved	Charging equipment, installed and reserved	Charging equipment, installed and reserved	Charging equipment, installed and reserved	Charging equipment, installed and reserved

		CMPJ Residence de l' aqua (Completed)	Ching-Geng Yanji (Completed)	PUJEN Yangmu (Completed)	CMP Midtown (In Progress)	PUJEN Yongji (Completed)	Park Mansion (Completed)	Beautiful Harmony (In Progress)	GLORIOUS (In Progress)	Zhongshan Art Mansion (In Progress)	PURE WISHES (In Progress)	Wenlin N Road Project (In Progress)	VISION UTMOST (In Progress)	SERENITY OF NATURE (Pre-sale)	THE ELITE (Pre-sale)
Green Design	Green Building	Silver level	Silver level		Gold level	Silver level	Silver level	Gold level	Silver level	Gold level	Silver level	Silver level	Silver level		Silver level
	Intelligent building	Gold level			Gold level								Silver level		
Other Green Projects	Recycling Management	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Damper control	●	●	●	●	●	●	●	●	●	●	●	●	●	●

• **Creating a higher standard of living through the merging of intelligent buildings and green buildings**

With the advent of the era of computing, high-efficiency intelligent homes have been developed through the integration of internet and the desire for a safe and healthy home environment that is convenient and improves the quality of life for the home dwellers. In addition, with the issue of climate change, it made sense to merge both intelligent buildings with green buildings and promote the two together. Buildings now can boast a green design and houses intelligent ICT equipment that allows a one to create a safe, healthy, convenient, comfortable, energy saving, and the environmentally friendly home—a practice that is mainstream in many countries. We are committed to building good homes.

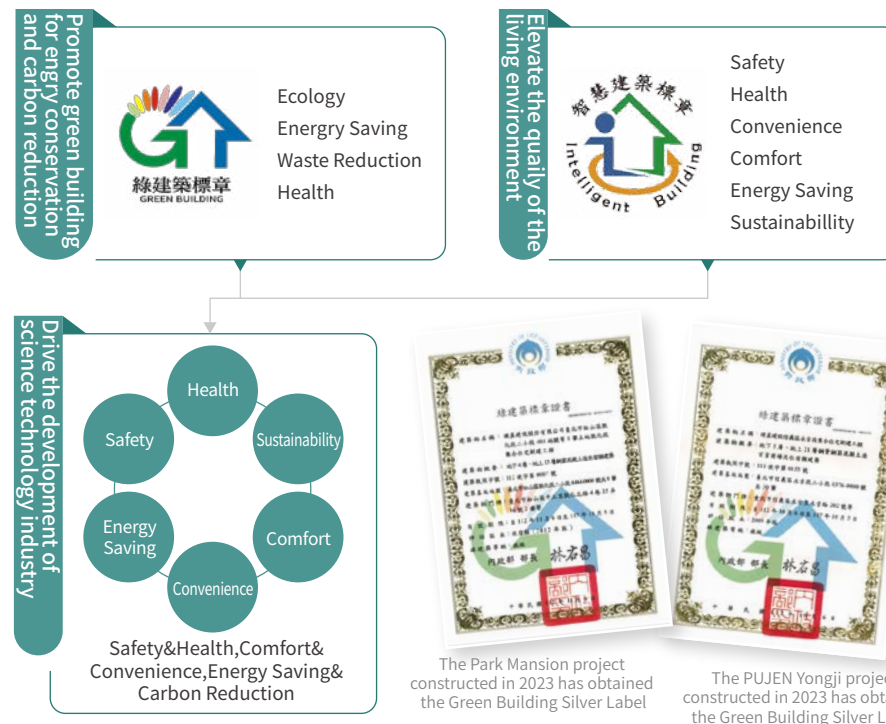
In 2019, CMPJ Residence de l' aqua received the Intelligence Building Gold Label for the residential category, and in 2020, Site A of CMP Midtown was nominated for the Smart Building Gold Certificate in the residential category.

We obtained the gold-class candidate green building certificate for Beautiful Harmony in 2022 while it was still under construction. Both Park Mansion and PUJEN Yongji, completed in 2023, were awarded the Green Building Silver Label.

• **Electric Vehicle (EV) Charging System**

With the phasing out of fuel vehicles in advanced countries around the world, pure electric vehicles will become increasingly popular in the market. In response to the emerging market trend, PUJEN Land Development started as early as in 2013 to adopt design that encompassed EV charging equipment and full power reserve for new construction cases.

In terms of the structure of electricity consumption, we adopt the public meter system exclusively for vehicle charging promoted by Taiwan Power Company. Meanwhile, charging energy management systems are built to charge at night during off-peak hours and intelligently regulate the power and time of charging piles for energy saving and off-peak electricity consumption.



▼ 5.3.5 PUJEN Anxinjv

• In-situ Earthquake Early Warning System and Structural Health Monitoring

PUJEN always pursue to improve and provide a safer living environment for clients. Taiwan is located in an earthquake zone, and we want to give our residents a comprehensive response plan in case of an earthquake. Therefore, we worked with the Group’s affiliate San Lien Technology Corp. and developed the Earthquake Early Warning System for the safety of the residents. We continue to incorporate the seismometer Palert into each building. Immediately after the earthquake, the structural health screening system is activated to check the safety strength of the building, so that the residents know whether they can return to the building and avoid secondary damage. Certain construction projects introduced seismometers to their design. The devices will be installed based on the project progress. Furthermore, Earthquake Early Warning System (EWS) and Structural Health Monitoring (SHM) will be incorporated into the building management system to continuously ensure living safety for clients.

Earthquake Early Warning System (EWS)

- Through measuring of P waves, earthquake warnings can be sent to residents prior to the occurrence of earthquakes.
- Reduce the risk of secondary disaster by connecting to relevant equipment such as elevators as an emergency response.



Structural Health Monitoring (SHM)

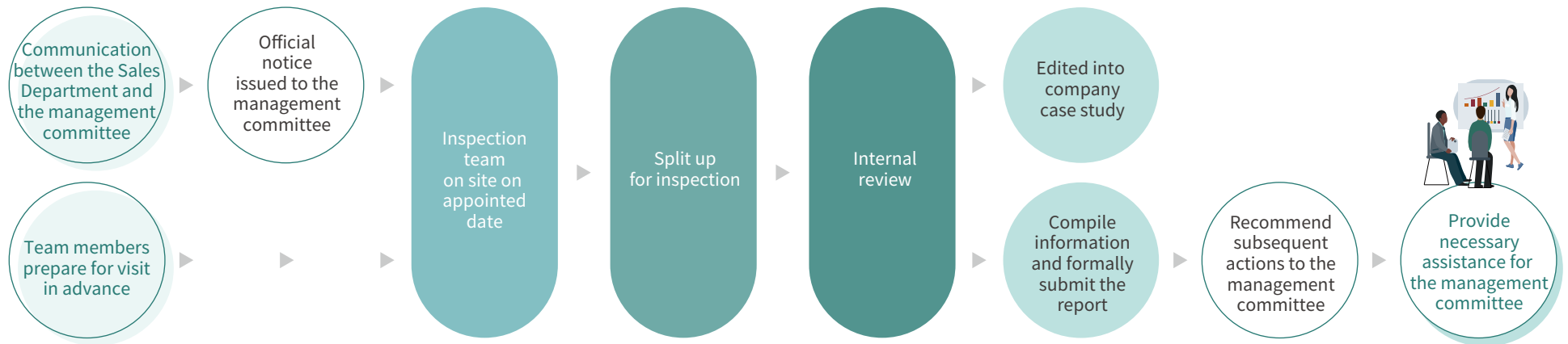
- Measure acceleration or displacement of structures caused by an external force.
- Assess the structural health of buildings after earthquakes to avoid secondary disaster.
- Assess the scope and location of damage, if any, and propose with a solution to either strengthen the building structure or reduce external vibrations.

• PUJEN Anxinjv — Building Safety Inspection Plan

After the Tainan earthquake in 2016, the Taiwanese government started to promote building safety inspections for old buildings. Just like regular health checkups, buildings also need to be inspected regularly for safety. To provide clients with a safer living environment, PUJEN assists in public facilities and building inspections in the community and reminds the community to maintain their equipment regularly. This extraordinary public service is rarely seen in the industry. Although we encountered many challenges, we still hope to do our best to provide a safe living environment for our clients

PUJEN was founded more than 20 years ago, has launched over ten projects. In order to maintain the smooth operation of the local community, PUJEN continues to provide the inspection service for public facilities and buildings. The purpose is to raise the awareness of equipment regular maintenance and to improve the safety and quality of living in the community.

For the sold projects, PUJEN continues to carry out inspections at the public areas including the surroundings on the first floor, the exterior appearance, landscape, entrance hall, the second foyer, various halls (depending on which floor is), the machine room, the roof deck (R1F), etc. The inspections are carried out by a team of seven led by the Construction Management and Customer Services Division and supported by the Sales Department. We assist three or four communities in conducting inspections each year. The inspection scope is divided into two parts, i) construction work and ii) electromechanics. After the on-site inspection, the team will provide its suggestions to the building management committee and help the committee to fix those problems.



PUJEN Anxinjv – Safety Checklist

| Engineering and Maintenance |

- ▲ Standard Duties
- ▲ Building Exterior
- ▲ Stairways
- ▲ Lifting Equipment
- ▲ Roof
- ▲ Public Area Renovations
- ▲ Maintenance Log

| Electromechanical Duties |

- ▲ Management’s Room
- ▲ Water Supply Pipelines
- ▲ Fire Safety and Engine Room
- ▲ Sewage System
- ▲ Generator Room
- ▲ Electrical System
- ▲ Equipment Maintenance and Maintenance Log

▼ 5.3.6 All-age Housing

In 2015, CMP Group, PUJEN Land Development, JJP Architects and Planners, Scenario Lab, Foundation of Universal Design Education, CMP PUJEN Foundation for Arts and Culture, and NCTU Graduate Institute of Architecture all participated in the project “All-age Housing”, integrating the industry practices with research methods in the academia to better understand the expectation of comfortable lifestyle and needs of the aging generation. We also apply the results to our construction products to create comfortable and safe homes for all ages and groups, with the goal of “aging in one’s home”.

► Introduction and Implementation of All-age and Safe Homes in Each Project

		Ching-Geng Yanji (Completed)	PUJEN Yangmu (Completed)	CMP Midtown (In Progress)	PUJEN Yongji (Completed)	Park Mansion (Completed)	Beautiful Harmony (In Progress)	GLORIOUS (In Progress)	Zhongshan Art Mansion (In Progress)	PURE WISHES (In Progress)	Wenlin N Road Project (In Progress)	VISION UTMOST (In Progress)	SERENITY OF NATURE (Pre-sale)	THE ELITE (In Progress)
Passageway and Traffic Flow	Indoor and outdoor entrances, exits, and passageways are smooth and easily accessible.	•	•	•	•	•	•	•	•	•	•	•	•	•
	Widen the passage of entrance and exit; Floor with no height difference	•	•	•	•	•	•	•	•	•	•	•	•	•
	Simple and clear signage	•	•	•	•	•	•	•	•	•	•	•	•	•
Public Facility	Elevators can access to the roof deck, allowing the relaxation spaces to have smooth traffic flow.	•	•	•	•	•	•	•	•	•	•	•	•	•
	Add parent-child friendly facilities in public restrooms for possible needs	•	•	•	•				•	•	•	•	•	•
	Place anti-slip mats at swimming pool and install more accessible facilities			•								•		

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Interior Space	Create short and convenient flow in living room; avoid complexity and zigzag.	•	•	•	•	•	•	•	•	•	•	•	•	•	
	Increase the size of bathroom and reserve room for handle installations.	•	•	•	•	•	•	•	•	•	•	•	•	•	
	Reserve room for future barrier-free facilities.	•	•	•	•	•	•	•	•	•	•	•	•	•	
	The height of the indoor and outdoor threshold (excluding balcony) should be 3 cm or less, and the thresholds that are 0.5 to 3 cm high should be with 1/2-inch bevel.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Installation of emergency alarms.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Bathroom doors are 75 cm or wider.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Indoor passages are 90 cm or wider.	•	•	•	•	•	•	•	•	•	•	•	•	•	•

		PUJEN Qingcheng (Completed)	Water Residence (Completed)	PUJEN Yiyi (Completed)	PUJEN Zuo (Completed)	CMPJ Residence de l' aqua (Completed)	Ching-Geng Yanji (Completed)	PUJEN Yangmu (Completed)	CMP Midtown (In Progress)	PUJEN Yongji (Completed)	Park Mansion (Completed)	Beautiful Harmony (In Progress)	GLORIOUS (In Progress)	Zhongshan Art Mansion (In Progress)	PURE WISHES (In Progress)	Wenlin N Road Project (In Progress)	VISION UTMOST (In Progress)	SERENITY OF NATURE (Pre-sale)	THE ELITE (Pre-sale)	
PUJEN safe homes	Earthquake Early Warning System	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Multi-application of Group Resources	Cast Iron Wheel Chocks	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Building Safety Inspection	Year of Implementation	2022	2023	2023	2022	2021														

2023 Building safety inspections completed in 2023: PUJEN Ningan Park Project, PUJEN Chongyang, PUJEN Yiyi, and PUJEN Shuiyu

▼ 5.3.7 Multi-application of Group Resources



Cast iron was a popular building material in Europe and America from the mid 19th century to the early 20th century, often used for building surface decoration, doors, windows, balconies, and railings to add an aesthetic element to buildings, and even for beam and column support. With the advancement of building technology, cast iron has been gradually replaced by steel and is no longer used for construction but mostly for decoration.

Cast iron products, made through founding and dewaxing, express the warmth from a traditional craftsman and complement modern architecture. PUJEN struck up a collaboration with the metal manufacturing branches of CMP Group, and integrated internal resources to design and develop unique cast iron parking bumpers with reinforced galvanized rust treatment for the finished product. Starting from the CMPJ project in 2010, all parking bumpers were exclusively made for PUJEN construction projects. The cast iron parking bumpers was a fantastic symbol of the integration of group culture, corporate image and resources.