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LAND, INFRASTRUCTURE, HOUSING AND PUBLIC UTILITIES



Land, Infrastructure, Housing and Public Utilities

Land and Urban Construction Bureau

The Land and Urban Construction Bureau is a government department under the supervision of the Secretary for Transport and Public Works, responsible for studying, planning, launching and implementing policies related to urban planning, land management, utilisation and development. The bureau is also responsible for issuing licences and supervising civil engineering projects, as well as monitoring the safety of electrical installations and mechanical equipment in buildings.

The restructured Land and Urban Construction Bureau officially commenced operations in April 2022, with four major executive and planning subsidiary units – Urban Planning Department, Land Management Department, Urban Development Department, and Electrical and Mechanical Installations Department, to promote urban construction work such as urban planning, land management, and the approval and supervision of private construction projects.

Macao Urban Planning

Detailed Planning

Since the announcement of By-law No. 7/2022 on Macao’s Urban Development Master Plan (2020-2040), the Macao Government has commenced detailed planning work for each planning zone in phases, covering Eastern District-2, Outer Harbour District-1, Outer Harbour District-2, Northern District-1 and Taipa Central District-2.

Detailed Planning for Eastern District-2

In May 2023, the summary report on the consultation for the draft of the Detailed Planning for Eastern District-2 was completed and publicly released. The draft was then discussed at the Urban Planning Committee meeting in June. In October, the final report was completed, and submitted to the legal departments to finalise the related by-law.

Detailed Planning of Outer Harbour District-1 and Outer Harbour District-2

In December 2023, the first phase report on services, for detailed planning of Outer Harbour District-1 and Outer Harbour District-2, was completed. The report included an analysis of the current situation, urban design concepts, development of a planning proposal, and a preliminary impact assessment. Subsequent follow-up work, on the second phase, has commenced.

Detailed Planning of Northern District-1

In June 2023, the first phase report (draft) on services, for detailed planning of Northern District-1, was completed. In December 2023, the revised first phase report (Version III) was approved,

marking the completion of phase 1.

Detailed Planning of Taipa Central District-2

In November 2023, the contract on services, for detailed planning of Taipa Central Taipa District-2, was awarded. In December, the first phase of drafting the detailed plan for Central Taipa District-2 commenced.

Project Plans

In September 2023, the second phase report on the Heritage Impact Assessment and Urban Design of the Area Around Avenida do Dr. Rodrigo Rodrigues was completed by a consultancy, and provided to the Cultural Affairs Bureau for submission to the UNESCO World Heritage Committee. In April 2023, the revision of the study on the overall planning of Macao's Gongbei Checkpoint and its environs was finalised.

Planning Condition Drafts

Urban planning conditions for districts lacking detailed planning are being compiled by the Land and Urban Construction Bureau in accordance with the Urban Planning Law and the Rules for the Implementation of the Urban Planning Law. During 2023, 62 sets of planning conditions for urbanisation management were issued.

Construction Companies and Contractors

The Land and Urban Construction Bureau is responsible for handling the registration or renewal of registration for individual business owners and businesses (involved in construction implementation), contractors (construction implementation), companies or individual business owners (urban construction and urban planning), companies (gas), and technicians (urban construction and urban planning). The bureau is also responsible for regularly updating information and assessing the statuses of related industries.

As at the end of 2023, a total of 1,449 individual business owners or companies (construction implementation), contractors (construction implementation), companies or individual business owners (urban construction and urban planning) and companies (gas) had applied to the Land and Urban Construction Bureau for registration, with details as follows:

Category	New registration	Renewed registration	Total
Contractors (construction implementation)	5	160	165
Individual business owners or companies (construction implementation)	75	994	1,069

(Cont.)

Category		New registration	Renewed registration	Total
Companies or individual business owners (urban construction and urban planning)	Plan drafting Construction supervision Construction monitoring	8	162	170
Companies (gas)		4	41	45
Total		92	1,357	1,449

Technicians

Law No.1/2015 – Qualification System for Urban Construction and Town Planning stipulates professional classifications for technicians. By the end of 2023, the number of valid or renewed registrations for ten types of technicians and engineers totalled 1,174. As seven people held two professional qualifications, the actual number of registered persons was 1,167. Details are as follows:

Category		New registration	Renewed registration	Total (person-time)
Technicians (construction and urban planning)	Architects	4	201	205
	Landscape Architects	0	3	3
	Civil Engineers	37	517	554
	Fire Engineers	0	7	7
	Electrical Engineers	1	104	105
	Electrical and Mechanical Engineers	6	176	182
	Mechanical Engineers	2	99	101
	Chemical Engineers	0	6	6
	Industrial Engineers	0	0	0
	Fuel Engineers	0	2	2
	Engineering Technicians	0	9	9
	Total	50	1,124	1,174

Infrastructure Projects

Private Construction Projects

Based on statistics from the Land and Urban Construction Bureau, in 2023, a total of 30 building projects were completed, providing 183 residential units with a total floor area of 10,901 square metres; 43 commercial units with a total floor area of 5,255 square metres; and five office units with a total floor area of 862 square metres. No building projects involving industrial/warehouse units, private car or motorcycle parking spaces were implemented during the year.

During 2023, construction commenced of 17 private projects providing 437 residential units with a total floor area of 33,130 square metres, and 21 commercial units with a total floor area of 2,063 square metres. No construction projects involving office or industrial/warehouse units were commenced during the year. Construction also commenced of 182 parking spaces (150 for private cars and 32 for motorcycles) in car parks, with a total area of 4,008 square metres.

By the end of 2023, 2,799 units were under construction, of which 2,608 were residential units with a total floor area of 178,193 square metres, 181 were commercial units with a total floor area of 34,967 square metres, nine were office units with a total floor area of 1,230 square metres, and one was an industrial/warehouse unit with a total area of 1,057 square metres; as well as 1,709 parking spaces (1,285 for private cars and 424 for motorcycles) in car parks, with a total area of 47,407 square metres.

During the year, 7,162 units were still in the design phase, of which 6,415 were residential units with a total floor area of 459,809 square metres, 667 were commercial units with a total floor area of 128,526 square metres, 75 were office units with a total floor area of 14,495 square metres, and five were industrial warehouses with a total floor area of 56,401 square metres; as well as 5,413 parking spaces (3,944 for private cars and 1,469 for motorcycles) in car parks, with a total area of 176,203 square metres.

In 2023, 8,151 applications were received for private construction projects, of which 1,964 were for demolition/ maintenance/ renovation, 2,350 were for simple projects in common parts of buildings, integrated construction projects for food and beverage establishments, and construction licences, and 489 were for construction and expansion projects.

During the year, 8,043 applications from 2023 and the previous year were handled, a majority of which were in the above-mentioned three major categories: 2,349 applications for simple projects in common parts of buildings, integrated construction projects for food and beverage establishments, and construction licences, 1,957 applications for demolition, maintenance and renovation projects, and 489 applications for construction and expansion projects.

Construction Document Certification

In 2023, the Land and Urban Construction Bureau's general archive unit handled 6,333 applications for certification of construction documents with approved licences.

Lift Equipment Supervision

Regarding electrical and mechanical installations, the Land and Urban Construction Bureau is

responsible for approving plans related to electrical installations and mechanical equipment, as well as supervising the inspection and maintenance of elevators and escalators, and the installation and operation of large-scale amusement facilities in construction projects.

In 2023, in accordance with the Guidelines for the Approval, Inspection, and Operation of Elevators and Escalators, 902 declarations related to elevators and escalators were received and processed. To ensure the safety of elevators and escalators, 343 random inspections of elevators and escalators were conducted throughout Macao during the year.

The Elevator and Escalator Safety Legal System came into force in April 2023. The Land and Urban Construction Bureau opened an online registration platform for the industry to register elevators and escalators. By the end of 2023, 1,501 applications for registration of existing elevators and escalators, involving a total of 8,584 units, were received, all of which were processed through the online platform. The registration work was completed by the end of March 2024, in accordance with the formal implementation of the Elevator and Escalator Safety Legal System.

The Land and Urban Construction Bureau actively expanded the functions of the online platform for elevators and escalators, adding notifications regarding the results of inspections and maintenance contract approvals, which were activated in accordance with the full implementation of the Elevator and Escalator Safety Legal System in 2024, thereby promoting and optimising the regulatory work through digitalisation.

The Public Works Bureau

The Public Works Bureau is responsible for assisting in formulating and executing policies related to public construction, as well as studying, planning, constructing and maintaining public buildings, infrastructure, and other large-scale public construction projects, as well as participating in, coordinating, and executing regional cooperation construction projects. It is under the supervision of the Secretary for Transport and Public Works.

Previously known as the Infrastructure Development Office, the Public Works Bureau has implemented the Macao SAR Government policies regarding the development of public buildings and infrastructure, completing numerous large-scale public projects such as Sai Van Bridge, Hong Kong-Zhuhai-Macao Bridge, the new Hengqin campus of the University of Macau, and Qingmao Checkpoint. With the establishment of the Public Works Bureau, public projects of the SAR Government can be more efficiently and effectively expedited, strengthening cooperation between Macao and neighbouring cities and regions, and constructing a sustainable, high-quality living environment for Macao.

In 2023, the first phase of the Conde S. Januario Hospital Expansion Project - Public Health Specialist Building, the new Public Security Police Headquarters Building and new Police Tactical Unit Headquarters Building, the new Customs Service Headquarters Building in Taipa, the Archive Building on Lot O4 in Pac On (known as Government Historical Archives Building), the road segment on the western stretch of New Urban Zone Area A, and the senior citizen housing project, have all been completed and handed over. The cross-boundary cooperation project on the overpass connecting the University of Macau and the Hengqin Checkpoint has also been completed and put into operation.

Hospitals/Government Buildings

Islands District Medical Complex

The Islands District Medical Complex is adjacent to the Taipa-Coloane Causeway, with a total land lot area of 75,800 square metres. The construction involves seven buildings, in addition to roads, public squares, vehicle flyovers, footbridges and related infrastructure facilities within the area, with a total floor area of 431,500 square metres.

First-phase construction includes: a nursing academy, staff dormitory building, a hospital complex, an auxiliary building, a general service administrative building and a central laboratory building. All of these were completed and put into operation. As for the second phase, construction of the rehabilitation hospital building began in December. The building has 15 floors and two basement levels, with four pedestrian bridges connecting to the hospital complex and a public bus station.

Government Office Buildings on Lot 12, Outer Harbour New Reclamation Area

Construction of the foundations and basement of the government office buildings on Lot 12 of the Outer Harbour New Reclamation Area commenced in September 2022. Two buildings – one with 12 floors, the other with 21 floors – and an underground car park will be built for government office use.

Government Office Buildings on Lot 25, Outer Harbour New Reclamation Area

Construction of the foundations and basement of the government office Buildings on Lot 25 of the Outer Harbour New Reclamation Area commenced in September 2022. Two buildings – one with 12 floors, the other with 17 floors – and an underground car park will be built for government office use.

Base Court Building on Lots C1 to C4 of Nam Van Lake

Construction of the foundations and basement of the Base Court Building commenced in November 2022. The building will have eight floors and an underground car park, and will be connected to the existing Base Court on Lot C2.

Court of Final Appeal Building on Avenida da Praia Grande

Construction of the foundations, basement and exterior wall support of the in-situ conversion project at the old Court Building on Avenida da Praia Grande and the former Judiciary Police Headquarters on Rua Central began in October 2022. According to the design, the building will have three floors and one basement. The old Court Building will be preserved, and some of its interior will be reorganised to serve new functions. Only the street-facing façade of the eastern wing of the former Judiciary Police Headquarters will be preserved, while the rest of the building will be demolished.

Court of Appeal Building on Lots C12 and C14 of Nam Van Lake

Open tender procedures regarding Lots C12 and C14 of Nam Van Lake have commenced. The project involves integrating the existing buildings of the Court of Final Appeal and the Court of Appeal, as well as the adjacent land, to construct a new five-storey Court of Appeal Building with three basement levels. Upon completion, the new building will be connected to the existing structures.

Road Infrastructure

Construction of Vehicle Flyovers at Rotunda da Amizade

The three-dimensional conversion of the Rotunda da Amizade, to alleviate traffic congestion in the area during peak hours. Phase 1, involving the ramp A and ramp C viaducts, was completed in November 2022. Phase 2 is underway, involving the 750-metre-long ramp B viaduct connecting New Urban Zone Area A to the Avenida do Nordeste, featuring a pedestrian walkway alongside.

The Fourth Macao-Taipa Cross-Harbour Bridge

The fourth Macao-Taipa cross-harbour bridge starts from the east wing of Macao New Urban Reclamation Zone Area A, links with the Artificial Island of the Hong Kong-Zhuhai-Macao Bridge, and ends at Macao New Urban Reclamation Zone Area E1. The 3.1-kilometre-long bridge includes an approximately two-kilometre-long cross-sea section. The bridge is designed to support eight lanes, including two in the middle that will be exclusively for motorcycles.

The construction of the bridge and the road networks connecting either end of the bridge is underway. To coincide with the completion of the bridge, the Public Works Bureau organised a contest to call for names for the Fourth Macao-Taipa Cross-Harbour Bridge on 16 December 2023. The event received overwhelming response from the public, with 5,703 residents participating and submitting over 14,400 suggested names.

Bridge Connecting New Urban Zone Area A and Macao Peninsula (A2)

Construction of this bridge commenced in November 2022, in conjunction with the overall development of New Urban Zone Area A, in order to connect the Macao peninsula and New Urban Zone Area A.

Bridge Connecting New Urban Zone Area A and Macao Peninsula (A3)

Following the completion of bridge A1 and the ongoing construction of bridge A2, the Government has begun construction of the third vehicle flyover connecting the Macao peninsula and New Urban Zone Area A. According to the plans, on the Macao peninsula side bridge A3 will split into four ramps, connecting to the Friendship Bridge, the Friendship Bridge ramps and Amizade Avenue and the road at the Outer Harbour Ferry Terminal, as well as the cross-harbour viaduct between the Urban Zone Area A and the Fourth Macao-Taipa Cross-Harbour Bridge. The 750-metre-long project involves a main bridge for two-way traffic, with two vehicular lanes and a ramp bridge

for one-way traffic with one vehicular lane. Open tender procedures for the construction project have commenced.

Vehicle Flyover at New Urban Zone Areas A and B

Located between the Macao peninsula and New Urban Zone Area A, the vehicle flyover for New Urban Zone Areas A and B will connect to the Rotunda de Centro de Ciência and Avenida Dr. Sun Yat-Sen at the western end, cross over the Friendship Bridge and the existing watercourse at the eastern end, and terminate in New Urban Zone Area A and link with the Fourth Macao-Taipa Cross-Harbour Bridge. Measuring 3.2kilometres in total length, the project will include a flyover, connecting road networks at both ends, a footbridge and a pedestrian tunnel. The 1,550-metre-long main bridge will include an approximately 900-metre-long cross-sea section, featuring four navigation channels with a maximum span of around 130 metres. Open tender procedures for the construction project have commenced.

Common Pipelines in New Urban Zone Area A

Construction of common pipelines in New Urban Zone Area A covers Northern District, Central District, Southern District, the East Axis and the Zhuhai-Macao Port Artificial Island. With a total length of 6.5 kilometres, the common pipelines form a circular layout around the New Urban Zone Area A, supporting public facilities including power supply, water supply, reclaimed water supply, and communication networks. Construction of the Central and Northern District sections is underway. Open tender procedures for the Southern District have commenced.

Public Housing Projects

To meet the people's housing needs, the Government has continued to launch a number of public housing projects since 2007. More than 10 Home-Ownership Scheme Housing and public housing projects were completed, including Edifício do Lago, Taipa; the public housing estates in Seac Pai Van; Bairro da Ilha Verde Building; Rua Central de Toi San; second phase of the Mong Ha Public Housing project; and reconstruction of the sports centre.

Public housing projects that are underway include: Avenida de Venceslau of Morais Public Housing project, and lots B4, B9, B10, A1, A2, A3, A4, A12, A5, A6, A10 and A11 of New Urban Zone Area A public housing phase 1. Open tender procedures for the public housing of lots B5, B7, B8, B11 and B12 in New Urban Zone Area A were completed.

New Urban Reclamation

In line with Macao's future development and to increase land supply, in 2006 the Government reported its land reclamation plan to the Central People's Government. The whole land reclamation plan received approval from the Central People's Government in December 2009, and the MSAR Government is expediting the land reclamation works.

The new urban reclamation area comprises five parts, with a total area of 350 hectares, and is

expected to provide Macao with a land reserve lasting 20 to 30 years. Reclamation works at Area A and Area E were completed in 2017, while works at Area C were completed in November 2022.

Cross-border Cooperation Projects

Hengqin Extension of the Macao LRT

As a major project to implement the Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area, the Hengqin Extension of the Macao LRT will improve the connections between Macao and mainland China cities via high-speed railway. The main structure consists of an elevated bridge, an underwater tunnel and two stations. The extension line is 2.2 kilometres long and the tunnel is 900 metres long. Construction of the stations, including the “HE1 Station” next to Lotus Flower Bridge Station on the current Taipa Line and the “HE2 Station” at the basement of Hengqin Port, is underway.

LRT Project

The LRT Taipa line commenced operations in 2019, while the Barra Station connecting Taipa line to the Macao peninsula commenced operations at the end of 2023. Construction of the Seac Pai Van line and East line is underway. At the end of 2023, the Standing Committee of the National People’s Congress approved a decision authorising the Macao SAR to exercise jurisdiction over the related land and sea areas southeast of the Gongbei Checkpoint in Zhuhai, Guangdong Province. The SAR Government will actively study the related work for extending the LRT East line to the Qingmao Checkpoint.

Macao Civil Engineering Laboratory

The Macao Civil Engineering Laboratory was established in 1988, and is a non-profit public legal body engaged in science and technology, which is autonomous in terms of technology, budget and assets. The chairpersons of the Board of the General Assembly and Board of Directors are both appointed by the Government.

The responsibilities of the Macao Civil Engineering Laboratory are to provide civil engineering and related technical support to the Government and relevant industries.

Housing

Housing Bureau

The Housing Bureau aims to fully implement the Government’s public housing policy, to assist Macao residents of weak financial standing in meeting their housing needs and rationally allocate public rental housing resources; provide technical coordination and assistance for strata-title buildings management; issue licences to and regulate enterprise owners engaged in strata-title buildings management in accordance with the law; monitor the real estate agency business; and issue relevant licences in accordance with the law.

Home-Ownership Scheme Housing

In the early years, Home-Ownership Scheme housing units were sold to families on the Housing Bureau's waiting list on terms and at prices stipulated in the land grant contracts by the bureau in accordance with Decree-Law No. 13/93/M.

Pursuant to Law No. 10/2011 – “The Home-Ownership Scheme Housing Law” re-promulgated by Executive Order No. 200/2020, the Government is responsible for construction of Home-Ownership Scheme Housing while the Housing Bureau or other public authorities appointed by the Chief Executive are responsible for the execution.

Rationale for Home-Ownership Scheme Housing

Home-Ownership Scheme Housing is intended to assist Macao residents of a particular income level and financial situation to meet their housing needs, and to promote a housing supply that suits the practical needs and purchasing power of Macao residents.

Home-Ownership Scheme Housing Allocation

The 1,900 units provided for the general applications for multiple-room Home-Ownership Scheme housing units launched at the end of 2013 were all sold. The validity period of the applicant priority list has ended.

The general application process for 3,017 housing units began at the end of November 2019. As of 31 December 2023, there were 2,978 eligible applications, 16 applications undergoing legal procedures, 870 ineligible applications, 125 withdrawn applications, 126 applications with changed priorities, and 96 applications with ongoing assessments.

The application process for 5,254 housing units was conducted from 14 July 2021 to 30 November 2021. A total of 11,707 applications were received. The priority list and cancellation list were announced on 14 December 2022, with 9,796 accepted applications and 1,911 cancelled applications.

A new phase of the general application process, for 5,415 housing units, was conducted from 27 September 2023 to 27 March 2024.

Public Housing

Public housing units are distributed in the form of leasing by the Government to Macao residents of weak financial standing. Families of weak financial standing are defined as those whose monthly household incomes and net asset values fall beneath the legally stipulated levels as stipulated by Executive Order.

The allocation and leasing of public housing are regulated by Law No. 17/2019 – Legal System for Public Housing and By-law No. 30/2020 – By-law of Rules for the Implementation of the Legal System for Public Housing.

Granting of Public Housing

Public housing was open for ongoing application from 20 August 2020 onwards. As of 31 December 2023, after a review of the applications, a total of 4,572 applications were accepted, with 1,880 households allocated housing.

Housing for the Sandwich Class

Law No. 17/2023 - The Legal System for Housing for the Sandwich Class came into effect on 1 April 2024. The Government is responsible for construction of Housing for the Sandwich Class, while the projects are executed by a public institution designated by the Chief Executive. The Housing Bureau is authorised to coordinate the sale of the units and monitor compliance with the law.

Rationale for Housing for the Sandwich Class

Housing for the Sandwich Class is intended to assist Macao residents of a particular income level and financial situation with meeting their housing needs, particularly through helping them acquire housing; and to promote a housing supply that suits the practical needs and purchasing power of Macao residents.

Building Management

The Housing Bureau exercises its supervisory power under Decree-Law No. 41/95/M dated 21 August to manage the common areas of Home-Ownership Scheme housing, and to require relevant parties to fulfil their duties stipulated in the applicable laws and regulations. The Housing Bureau may impose fines on management entities or strata-title building owners who violate their duties as stipulated in the Decree-Law.

The Housing Bureau also facilitates and helps owners of strata-title buildings under the Home-Ownership Scheme with arrangements for setting up management organs and convening the first meetings, and provides technical assistance to owners, management organs and corporate managers of strata-title buildings. In 2023, the bureau handled 4,692 cases of Home-Ownership Scheme management-related affairs, fostered 93 management bodies of Home-Ownership Scheme housing that are already in place and operating effectively, handled 1,017 cases involving the general assembly of owners of strata-title buildings under the Home-Ownership Scheme and affairs regarding the operations of management bodies, and handled 3,667 cases involving the management of common areas in private housing.

The Housing Bureau also keeps abreast of all necessary renovation and improvement works for public housing. In addition to public facilities of housing estates, it strives to improve indoor facilities, so as to improve the quality of life of its tenants, particularly for elderly single people.

Strata Title Buildings Management Commercial Operation

In accordance with the Law on the Commercial Management of Strata Title Buildings effective

from 22 August 2018, it is mandatory to obtain a valid licence to engage in commercial management of strata-title buildings. As of 31 December 2023, there were 236 valid licences for commercial management of strata-title buildings.

To align with the implementation of the Law on the Commercial Management of Strata Title Buildings and execution of various tasks, in 2023 the bureau conducted 16 inspections of strata-title buildings, received complaints from strata-title building management company owners, and handled cases referred by other public departments, to monitor compliance with the Law on the Commercial Management of Strata Title Buildings by strata-title building management company owners, and to initiate disciplinary proceedings arising from alleged administrative irregularities. In 2023, 15 cases involving strata-title building management company owners resulted in penalties for breaking the law.

The Property Maintenance Fund

To encourage and help homeowners to perform their duties regarding maintenance of common building areas, in March 2007, the Government established the Property Maintenance Fund to assist them with inspecting, testing and repairing, and establishing management bodies for the common areas of private housing.

As at 31 December 2023, 601 applications for the seven schemes under the Property Maintenance Fund were approved, with subsidies totalling over 62 million patacas. A total of 6,079 applications have been approved since the establishment of the fund, with subsidies granted totalling 590 million patacas.

Joint Centre for Building Leakage Issues

Through cross-departmental cooperation among the Land and Urban Construction Bureau, Municipal Affairs Bureau, Health Bureau, Legal Affairs Bureau and Housing Bureau, the Government established the Joint Centre for Building Leakage Issues in 2009. The centre provides one-stop assistance to owners of flats that are origins of leaks to encourage maintenance. In 2023, 2,051 cases were filed for investigations; and there was follow up work regarding 2,700 cases, 2,046 of which were completed.

Squatter Area Clearance

To comply with Macao's urban planning policies and the reallocation of land use, the Housing Bureau is committed to clearing squatter camps and relocating affected residents. In 2023, ten squatter dwellings were demolished. By the year-end, 399 squatter dwellings remained, of which 183 were on the Macao peninsula and 216 in the Islands District.

Real Estate Agency Business

According to the Real Estate Agency Law, which took effect on 1 July 2013, all real estate agents and brokers are required to obtain a valid licence before engaging in business. The Housing Bureau

has also set up a unit to follow up applications for licences for real estate agents and brokers, and be responsible for the relevant monitoring work.

As at 31 December 2023, the numbers of valid licences for real estate agents and brokers totalled 1,487 and 4,994, respectively.

Supervision

To facilitate the implementation of laws and various tasks, during 2023 about 2,468 inspections were conducted in business premises of real estate agents, to check compliance with the Real Estate Agency Law by real estate agencies, and to initiate disciplinary proceedings against alleged administrative irregularities. Complaints about real estate agents and brokers were received and cases referred by other public departments were handled in accordance with the relevant laws.

During 2023, 30 cases involving real estate agents and four cases involving real estate brokers resulted in penalties for breaking the law.

Land Management

Lands Committee

The Lands Committee is a consultative body supervised by the Secretary for Transport and Public Works. The committee is responsible for advising on cases concerning granted land, land use by recipients of land grants, public use of granted land; and granting, renewing, renouncing or cancelling temporary land-occupation licenses.

Land Concessions

According to the Land and Urban Construction Bureau, 11 land grant contracts were completed and eight orders for land exchange were issued in 2023. These contracts were as follows:

- Leases and grants: two contracts, involving a total floor area of 3,809 square metres, with a newly granted area of 3,225 square metres;
- Long-term leases: six contracts, involving a total floor area of 538 square metres, with a returned land area of 66 square metres;
- Special purpose concessions: one contract, involving a newly granted area of 2,209 square metres;
- Gratuitous concessions: two contracts, involving a total floor area of 215,738 square metres, with a newly granted area of 4,103 square metres; and
- Returned land: eight contracts, involving a total floor area of 26,008 square metres.

The land granted in 2023 was mainly for residential, commercial, industrial, car parking, social facility and other development uses. No land was granted for office or hotel uses. In 2023, the land grant revenue totalled 938,165,177 patacas, which included 893,666,000 patacas from land auctions

and 44,499,177 patacas from premium income. During the year, the total actual premium income received was 52,870,360 patacas (as some premiums are paid in instalments every half year, the income receivable in a year differs from the actual amount received).

The Council of Architecture, Engineering and Urbanism

The Council of Architecture, Engineering and Urbanism (CAEU) has been established according to Law No.1/2015 – Qualification System for Urban Construction and Town Planning, in order to accredit and register holders of professional degrees in 13 subjects: architecture, landscape architecture, urban planning, civil engineering, fire engineering, environmental engineering, electrical engineering, electrical and mechanical engineering, mechanical engineering, chemical engineering, industrial engineering, fuel engineering and transport engineering.

According to the aforementioned legal provisions, application for accreditation and registration is only open to those who have been approved for completion or exemption of field training, and have passed qualifying examinations.

During 2023, 56 people were approved for professional registration after second reviews; they were from six disciplines: civil engineering, architecture, electrical and mechanical engineering, mechanical engineering, urban planning and environmental engineering. From the law coming into effect in 2015 until the end of 2023, accredited professionals in the 13 disciplines totalled 2,746, with the breakdown as follows:

Professions	Numbers of registered professionals (2023)	Numbers of registered professionals (2015-2023)
Civil Engineering	40	1,145
Architecture	4	425
Electrical and Mechanical Engineering	5	342
Electrical Engineering	0	316
Mechanical Engineering	2	279
Environmental Engineering	2	97
Urban Planning	3	61
Chemical Engineering	0	22
Traffic Engineering	0	19
Fire Engineering	0	18

(Cont.)

Professions	Numbers of registered professionals (2023)	Numbers of registered professionals (2015-2023)
Landscape architecture	0	17
Industrial Engineering	0	3
Fuel Engineering	0	2
Total	56	2,746

In 2023, 145 practitioners of various professional disciplines received council approval to join internships. As at the end of 2023, the number of practitioners since the law came into effect was 993, with details as follows:

Professional Discipline	Number of Interns (2023)	Number of Interns (2015-2023)
Civil Engineering	74	515
Architecture	9	144
Electrical and Mechanical Engineering	23	143
Electrical Engineering	17	97
Mechanical Engineering	16	65
Environmental Engineering	3	15
Urban Planning	3	8
Fire Engineering	0	3
Landscape architecture	0	3
Total	145	993

In 2023, a total of 43 practitioners of various professional disciplines received council approval to register as internship instructors. As at the end of 2023, the number of instructors since the law came into effect was 695, with details as follows:

Professional Discipline	Number of internship instructors (2023)	Number of internship instructors (2015-2023)
Civil Engineering	23	308
Architecture	1	114
Electrical and Mechanical Engineering	7	116
Electrical Engineering	7	67
Mechanical Engineering	3	57
Environmental Engineering	1	16
Urban Planning	0	6
Fire Engineering	0	6
Chemical Engineering	0	1
Landscape architecture	1	2
Fuel Engineering	0	2
Total	43	695

In 2023, 131 practitioners of six professional disciplines were approved for qualifying examinations. As at the end of year, the total number since the law came into effect was 511 from nine professional disciplines, with details as follows:

Professional Discipline	Number of practitioners eligible for qualifying examinations (2023)	Number of practitioners eligible for qualifying examinations (2015-2023)
Civil Engineering	57	280
Architecture	15	70
Electrical and Mechanical Engineering	21	66
Electrical Engineering	20	46
Mechanical Engineering	16	32
Urban Planning	0	5
Environmental Engineering	2	10
Fire Engineering	0	1
Landscape architecture	0	1
Total	131	511

In accordance with Law No. 1/2015 – “Qualification System for Urban Construction and Town Planning”, those in the private sector who have completed at least two years of internship in a relevant professional discipline and obtained examination candidatenhip, and those public administrative workers who hold a professional degree in a relevant discipline, having been engaged with the relevant profession for at least three consecutive years, and have obtained a waiver of internship from the council, are eligible to sit for the qualifying examination of the relevant professional discipline.

The CAEU held three qualifying examinations during 2019-2022, with 206 candidates passing the examination and obtaining professional qualifications. The 2023 qualifying examination – a written test – was held at the end of the year, and was attended by 227 candidates from seven professions: architecture, civil engineering, electrical engineering, electrical and mechanical engineering, mechanical engineering, environmental engineering and urban planning. Only those who passed the written test would be eligible for the second-phase professional interview.

Urban Planning Committee

The Urban Planning Committee, established in accordance with Law No. 12/2013 – Urban Planning Law, serves as the Government’s consultation body and is responsible for discussing and providing opinions on compiling, implementing, reviewing and amending urban plans; advising on the scope for issuing urban planning conditions according to the law; initiating discussions and providing suggestions to the Urban Development Strategy Study; by-laws and draft bills related to urban planning; urban planning technical requirements and guidelines; and other matters assigned by the Chief Executive.

In 2023, in accordance with the provisions of Law No. 12/2013, members were reappointed, and three new members were appointed through Chief Executive Order No. 33/2023.

During the year, the Urban Planning Committee followed up regarding and discussed the urban plans concerning 63 cases. In accordance with the aforementioned legal provisions, members listened to a briefing on the draft of the Detailed Planning for Eastern District-2 during a plenary meeting, conducted discussions and provided opinions. In addition, members attended and participated in three workshops, including: a briefing on plans for construction of the Eastern District-2, a research workshop on the Heritage Impact Assessment and Urban Design of the Area around Avenida do Dr. Rodrigo Rodrigues, and a briefing on the skywalk at the Avenida do Nordeste, to gain an in-depth understanding of the related project plans.

Urban Renewal Committee

The Urban Renewal Committee, established in accordance with By-law No. 5/2016 – “Urban Renewal Committee”, serves as a government advisory body on formulating urban renewal policy, and is responsible for coordinating between urban renewal policy strategies and other sectorial policies; launching policy management measures and urban renewal campaigns; anticipating the effects of implementing urban renewal measures and actions; conducting research and providing solutions and recommendations on urban renewal related by-laws and draft bills and regulations.

Cross-department Committee

The Cross-department Committee was established in accordance with By-law No. 5/2014, to liaise and follow up regarding the compilation, review, revision and assessment of implementation of urban planning.

There are eight members of the Cross-department Committee, each with a three-year tenure. They are the Director of the Land and Urban Construction Bureau, who was appointed as the coordinator, and representatives from the Cultural Affairs Bureau, the Municipal Affairs Bureau, the Transport Bureau, the Public Works Bureau, the Environmental Protection Bureau, the Housing Bureau and Macao Government Tourism Office.

In 2023, the committee provided opinions on the detailed planning for Outer Harbour District-1, Outer Harbour District-2 and Northern District-1.

The committee also attended the plenary meeting of the Urban Planning Committee, to listen to opinions and recommendations on the detailed planning for Eastern District-2 and followed up regarding the compilation of the final report.

Water Disposal System

Macao's water disposal system includes the independent networks of the Macao peninsula and Taipa and Coloane islands. Details are as follows:

Water Drainage Systems in 2023										
Area	Type	Public sewer system (metres)				Rainwater drains (units)	Public sewage inspection pit (manhole) system (units)	Public rainwater pipe outlets (units)	Outlet valves (units)	Pumping stations (units)
	Sewage piping	Rainwater piping	Combined piping	Flow interceptors (rainwater and sewage)						
Macao		106284.64	110959.70	60295.06	19078.32	16951	12095	165	26	35
Taipa		39638.54	68593.12	431.05	26607.7	5638	4248	77	1	30
Coloane		27101.86	30907.87	0	16110.5	2183	1985	52	1	18
Total		173025.04	210460.69	60726.11	61796.52	24772	18323	294	28	83

The Drainage Division of the Municipal Affairs Bureau is responsible for cleaning and dredging the drainage systems of Macao, inspecting and monitoring their operations, making improvements, and registering relevant information.

During 2023, the Drainage Division received 2,236 complaints related to sewage systems, 1.5 percent more than in 2022. In addition, the division cleared and cleaned over 220,000 metres of public sewers and rainwater drains, during more than 38,000 clearing and cleaning operations. The division conducted more than 1,000 inspections of grease traps in food premises, issued over 90 on-site records for places with malfunctioning grease traps, conducted over 840 inspections of construction site drainage, and prosecuted 50 cases of illegal polluters.

Slope Maintenance

To enhance monitoring of various slopes in Macao, the Government set up a slope safety task force in 1995, to help with classifying the risk levels of slopes through regular onsite inspections, and identifying areas for strengthening and maintenance. Regarding private slopes, the responsible unit liaises with the related property owners, in order to implement measures in accordance with the advice of the inter-departmental slope safety assessment.

Members of the inter-departmental slope safety assessment task force comprise engineers from the Public Works Bureau, the Land and Urban Construction Bureau, the Municipal Affairs Bureau and the Macao Civil Engineering Laboratory. The Public Works Bureau and the Municipal Affairs Bureau are responsible for maintenance of roads and slopes, respectively.

According to the statistics from the Public Works Bureau, there were 279 risky slopes in Macao during 2023. During the year, the Public Works Bureau conducted two slope improvement projects, and the Municipal Affairs Bureau followed up on eight slope improvement projects.

Number of slopes / risk	High	Medium	Low	Total
Macao peninsula	88	37	0	125
Taipa island	47	23	1	71
Coloane island	61	22	0	83
Total	196	82	1	279

In 2014, the Government began setting up an automatic slope monitoring system at Taipa Grande. The system effectively provides real-time monitoring of slope data. The real-time data on slope dislocation, subsidence and cracks is sent to the Macao Civil Engineering Laboratory and the Public Works Bureau, enabling early precautionary measures and alerts.

The second monitoring system in Macao, at Mount Fortress slope slot, commenced operations in 2020, to better support the real-time monitoring on the Macao peninsula and the Islands District.

Surveying and Mapping

Cartography and Cadastre Bureau

The Cartography and Cadastre Bureau is supervised by the Secretary for Transport and Public Works. It specialises in setting up and maintaining the Government's Geodetic Control Network and Geometric Levelling Network. In addition, the bureau supports land-management activities, drafts maps of various types and scales, and maintains the cadastre management.

Cadastre Management

The Cadastre Division of the Cartography and Cadastre Bureau has operated a cadastral database since 1983. The bureau also produces cadastral maps in accordance with the provisions of the Cadastre Law. The division continuously updates related information. The Cartography and Cadastre Bureau launched the Cadastral Information Net in 2008 and an online shop for cadastral maps in 2011. In 2019, the Cadastral Information Net became accessible on mobile devices. In 2021, the digital cadastral map service was launched.

The Cadastre Division also provides survey information from its database to landowners who need to re-measure land boundaries for valuation, transaction or development purposes.

Land Surveying and Cartography

The Cartography and Cadastre Bureau provides a wide range of land survey and cartography services. It also provides topographical maps at various scales with Chinese and Portuguese footnotes, digital cartography of Macao, aerial photos taken in 1941, 1980, 1988, 1993 and 1998, posters, the map of the Macao SAR and its peripheral regions, and thematic maps.

Satellite Positioning Reference Station

To ensure that the satellite positioning services can effectively cover all areas of Macao, the Cartography and Cadastre Bureau established and began operating four Global Positioning System (GPS) reference stations – at Mount Fortress, Alto de Coloane, Taipa Grande on Taipa island and the University of Macau – in 2002, 2005, 2008 and 2016, respectively. The reference stations can receive both GPS signals, data from the Russian GLONASS system (Global Navigation Satellite System) as well as BeiDou Navigation Satellite System (BeiDou), supporting the applications and development of land, cadastral and engineering surveys of Macao, as well as data collection for the Geographic Information System (GIS).

The satellite positioning reference stations provide three main services. The first two provide satellite observation data download services and automatic coordinate calculation services through the Macao Satellite Positioning Reference Station Service (mosref.dscg.gov.mo) launched in 2009. The other is an NTRIP (Networked Transport of RTCM via Internet Protocol) service launched in 2012. Real Time Kinematic (RTK) corrections were provided to professional users through 3G mobile communication and internet technologies, enabling them to use real-time GPS applications

that are accurate to within a centimetre. In 2021, the Reference Station Service website was optimised and began providing satellite reference data from the BeiDou Navigation Satellite System for public use.

In 2013, the bureau and Hong Kong's Lands Department shared data from their own satellite positioning reference stations. The bureau also expanded the coverage of real-time dynamic positioning services to the waters between Hong Kong and Macao and the western part of Hong Kong, thereby providing a more stable and reliable satellite positioning service to all users.

Geographic Information System

In response to society's needs, the Cartography and Cadastre Bureau has introduced various kinds of geographic information systems, including the Cadastre Information Web (cadastre.gis.gov.mo), a comprehensive land information platform that combines information from various departments on land and buildings. Users can inquire about land grants, easement and commitment, buildings, locations, drawing easement, plans for urban conditions, prior approval for buildings under construction, maximum altitude for buildings in the neighbouring area of the Guia Lighthouse, lists of historic urban areas and heritage under conservation, boundary of the special administrative region, and other pertinent information.

In addition, the website contains statistical data, executive procedures and laws related to land. By the end of 2023, the website had received over 1.88 million visitors since its launch in 2008. The website supports desktop and mobile devices, meeting the needs of different users.

The Macao Online Map (webmap.gis.gov.mo) provides geographical information to meet citizens' everyday needs in traditional Chinese, simplified Chinese, Portuguese and English. Citizens can search for 60 kinds of useful information on everyday life, including on buildings, streets, government departments, tourist spots, food and beverage, and emergency shelters in Macao – catering to needs including health care, food, housing, transportation, sports and entertainment.

The Macao Online Map features a Walking Routes Map, which includes recommended walking routes and times required. In 2020, Macao 3D Map was launched. This supports mobile devices, allowing the public to visualise a three-dimensional picture of the whole of Macao from multiple viewing angles. Since its launch in 2001 till the end of 2023, the online map had received more than 8.65 million visitors.

In line with the development of information technology and in response to public demand, in 2012 the Cartography and Cadastre Bureau introduced the Macau GeoGuide iOS/Android app. In addition to searches for buildings, streets and street numbers, the application also allows users to search for nearby points of interest and share information about attractions, and can show aerial photographs and offline maps, providing on-the-go geographic information required by users.

An updated version of the Macau GeoGuide was published in 2023, adding search functions for LRT routes, further optimising route planning function, providing users with five different travel options – walking, leisure walking, bus, LRT and driving. A satellite image layer was also added, to enrich the map browsing experience.

GeoGuide for Emergencies is a geographical iOS / Android app that enables the public to

obtain the latest emergency-related geographical information through their mobile phones. It was launched by the Cartography and Cadastre Bureau with the support of the Unitary Police Service, the Meteorological and Geophysical Bureau (SMG), the Environmental Protection Bureau, the Marine and Water Bureau, the Education and Youth Development Bureau (DSEDJ), the Social Welfare Bureau and the Municipal Affairs Bureau. GeoGuide for Emergencies provides the public with important geographical information about regions that may be affected during all levels of storm surges, as well as areas that are expected to be affected by the suspension of power, emergency shelters, assembly points for people with limited mobility/places to stay during an emergency evacuation, pre-planned walking routes to the nearest emergency shelters, and real-time alerts about bad weather, real-time water level monitoring data, real-time maritime information and risk/disaster prevention guidelines.

To support the development of a smart city, the Cartography and Cadastre Bureau launched the Applications Programming Interface for Geographic Information service in 2021, providing a programming interface for map services across Macao. The latest online maps of Macao are displayed through webpages and mobile apps, boosting the application of geographic information.

The Cadastral Information Net (intranet version) provides real-time land information for public works, housing, land planning and management, environment supervision and municipal administration. As well as information available on the Cadastral Information Net, the intranet version provides Government departments with information such as forms of land use, aerial photos and satellite photos over the years, land area and housing record codes.

In 2020, the Information Centre of DSCC Applications was launched. This provides key services, geographical statistical data, geospatial information, and a three-dimensional map covering the entire Macao. These services enable the public to obtain the latest practical information on geography and land registration through their mobile phones, at any time.

Electric Power

To align with the construction of New Urban Zone Area A, construction of a 110kV high-voltage substation on Lot A7 is planned. The preliminary design for the substation and related power grid has been completed, and construction of the substation's main structure is currently underway.

In 2023, the Government continued offering the electricity fee subsidy of 200 patacas per month per household, to alleviate the electricity fee burden on residents.

Natural Gas

The Government continued optimising the natural gas pipeline network, connected the Macao-Taipa cross-harbour gas supply pipeline, and completed the interconnection of the main pipeline network to the northern and southern parts of the Macao peninsula. The cross-harbour gas pipeline laid across the fourth Macao-Taipa cross-harbour bridge serves as the necessary infrastructure for achieving a dual-loop gas supply in future, further ensuring the stability and safety of gas supplies. The Government continued expanding the coverage of the Macao peninsula gas pipeline network, while encouraging large hotels, tourist facilities and businesses to prioritise or switch to natural gas.

By the end of 2023, 26.8 kilometres of the project to construct a 34-kilometre natural gas trunk pipe network on the Macao peninsula had been completed, representing a 78.8 percent completion rate.

Utility Tunnels

The Environmental Protection Bureau continued to assist in expediting the construction of the common pipeline in New Urban Zone Area A.

Energy Efficiency and Conservation

The Environmental Protection Bureau and relevant departments continued to promote and implement measures to introduce and promote environmentally friendly vehicles according to schedule, and formulated the plan to promote electric vehicles in Macao. By the end of 2023, there were 8,263 electric vehicles in Macao: 4,439 light vehicles, 973 heavy vehicles, 2,074 heavy motorcycles and 777 light motorcycles.

Since the launch of the scheme for installing electric vehicle charging stations in public car parks in 2016, as of the end of 2023, a total of 2,873 public charging stations had been installed, including 2,273 charging stations for light vehicles (in 60 public car parks and along six public roads) and 600 charging stations for motorcycles (in 49 public car parks).

In addition, seven public car parks have installed cabinets for exchanging electric motorcycle batteries. The Environmental Protection Bureau will plan for the next phase of the public charging station scheme in accordance with the growth of electric vehicles and the utilisation of charging stations. In response to the latest developments and situation of electric vehicle charging stations in private car parks, the Instructions for the Installation of Electric Vehicle Charging Facilities in Private Car Parks were updated in February 2023, in collaboration with relevant departments.

Since the launch of the large-scale replacement of smart meters in 2021, it was planned that 50,000 meters would be replaced by smart meters every year, so that all electricity meters in Macao would be smart meters by 2025. As of the end of 2023, smart meters accounted for 76.3 percent of all electricity meters in Macao.

To promote solar photovoltaic power generation, the Government created incentives in terms of feed-in tariffs and photovoltaic power contracts, encouraging the installation of related systems to gradually expand the use of green energy. As of the end of 2023, 31 enquiries were received, including projects for private, school, commercial and industrial buildings, public utilities and public departments. Among them, nine cases have already been connected to the grid for sale of electricity, with a total installed capacity of 3,226 kilowatts.

Photovoltaic systems were also installed on the buildings of the Housing Bureau, the Institute for Tourism Studies, the Government Printing Bureau, Edifício Hou Kong, and the parking shed at the Taipa Ferry Terminal. In future, photovoltaic systems will also be installed on eligible public buildings, including the planned installation at the Cross-border Industrial Zone Sewage Treatment Plant.

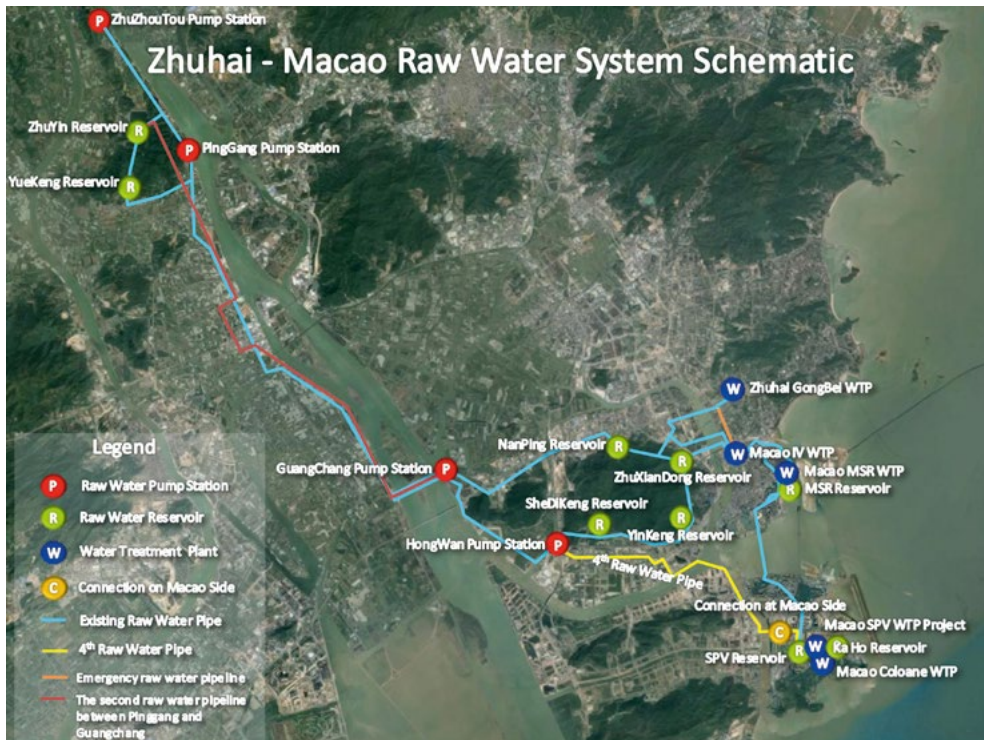
Drinking Water

Macao Water Supply Company (or “Macao Water”)

Established in 1935, the Macao Water Supply Company (Macao Water) is a private enterprise in Macao which provides a safe, reliable and quality water supply service. The company signed a 25-year water-supply concession contract with the Government in 1985. In 2009, the contract was extended for 20 years, to 2030.

Raw Water Supply

Macao’s raw water supply from Zhuhai has two main components: the southern pumping station opened in 1988 and part of the Zhuyin Pumping Station opened in 2007. The two stations are connected by the Guangchang Pumping Station. The layout of the whole system is shown in the map below.



On the map, the red labels mark the locations of four major raw water booster pumping stations, for which Zhuzhoutou, Pinggang and Guangchang are the major water inlets. Some 95 percent or more of Macao’s raw water comes from the Xijiang (West River). Starting from 2006, to mitigate salinity effects, the raw water intakes located at Modaomen, Zhuhai, have been moved over 20 kilometres upstream, which was extended to Pinggang pumping station. In 2011, it was extended

to Zhuzhoutou pumping station.

The green labels identify reservoirs, including the Outer Harbour Reservoir, the Seac Pai Van Reservoir and Ka Ho Reservoir in Macao, and Zhuxiandong Reservoir, Nanping Reservoir, Shedikeng Reservoir in Zhuhai. To mitigate salinity effects, the Zhuyin Reservoir was built in Pinggang, with an effective volume of 40 million cubic metres, and became operational in autumn 2011.

The pipeline with yellow labels is the fourth raw water pipeline, which began supplying water to Macao in the fourth quarter of 2019. The pipeline is connected to two DN2000 bypass pipelines from Guangchang Pumping Station at the rear of Hongwan Pumping Station. After being pressurised at the Guangchang Pumping Station, the raw water is directly transmitted to the Seac Pai Van Reservoir.

The pipeline with red labels is the second Pinggang-Guangchang raw water pipeline which was jointly constructed by Guangdong and Macao, and began supplying water in October 2020. This enables the West to East Water Diversion Project in Zhuhai and Macao to achieve dual-line operation, with a daily water supply capacity of two million cubic metres, significantly enhancing Macao's ability to ensure water supply security.

In 2023, Zhuhai supplied about 273,000 cubic metres of water to Macao each day, which totalled 99.54 million cubic metres of raw water during the year. The water quality was certified as Grade II, according to mainland China's Environmental Quality Standards for Surface Water (GB3838-2002), except during occasional salt tides in winter and spring.

Water Treatment, Storage and Transportation

Macao's water treatment capacity is currently 520,000 cubic metres per day. The combined storage capacity of Macao's reservoirs (including the clean water pond and high pool in the water treatment works) is 94,000 cubic metres. In 2023, the total length of main pipelines was 648 kilometres.

At the end of 2023, the total volume of raw water stored in Macao's reservoirs (including the Main Storage Reservoir, the Seac Pai Van and Ka Ho Reservoir) was 2.64 million cubic metres, including 1.6 million cubic metres in the reservoir near the Outer Harbour. The Ka Ho Reservoir underwent expansion from 2019 to 2022 and was officially handed over to Macao Water at the beginning of 2022. It has a capacity of 740,000 cubic metres.

A total of 97.24 million cubic metres of water were supplied in 2023, 7.7 percent more than in 2022. The daily average volume supplied was around 266,000 cubic metres, with a maximum of 301,000 cubic metres recorded on 14 July. In 2023, the total capacity of water sales was 89.16 million cubic metres, with a daily average of 244,000 cubic metres.

Testing Water Potability

The Macao Water Laboratory and Research Centre shoulders the responsibility of testing water quality, and ensuring the quality of water supplies. On a daily basis, the Laboratory and Research Centre and Municipal Affairs Bureau Laboratory jointly analyse random water samples taken from water processing plants and sampling points of pipelines every day. The quality of water from the

water processing plants has always reached the standard specified in the contract signed with the Government and the potable water standard stated in Annex One of the Macao Drainage Regulations. In addition to water quality monitoring and testing of treated water, the Laboratory and Research Centre of Macao Water also monitors the quality of raw water supplies from Zhuhai to Macao and reservoirs in Macao, and issues warnings if pollution is detected; and provides firsthand information on raw water for production purposes, to ensure the water is safe for consumption.

In 2000, the Laboratory and Research Centre was issued a Laboratory Accreditation Certificate of ISO/IEC17025 Standard by the China National Accreditation Service for Conformity Assessment (CNAS).

Over the years, the Laboratory and Research Centre has achieved distinguished results in the inter-laboratory sample checks administered by its parent company - Lyonnaise des Eaux Group, and has been repeatedly regarded as a reference laboratory within the group.

Customer Services

Macao Water promptly and properly handles customer enquiries and provides customer services through a consolidated customer information system. Over the years, it continues to improve its services by providing convenient payment and enquiry services, exploring communication channels for customers, and actively fulfilling its corporate social responsibility.

Macao Water has continued to develop a variety of payment platforms that allow customers to pay charges flexibly. It has launched several convenient electronic services, including an official website, QR codes in water bills, electronic billing, a safe email box co-established with the Macao Post and Telecommunications Bureau, an official WeChat account, mobile payment, Macao One Account and online ticket collection, allowing residents to easily handle water supply services.

Macao Water set up a customer liaison group and a customer service unit in 2000 and 2012, respectively, to closely liaise with customers and understand their opinions on water supply services.

To raise public awareness about saving water, Macao Water fully supports the Government in the new water charges system, which was introduced on 1 January 2011. This was the first time an itemised and sliding scale of water tariffs was launched, and a waiver of fees was offered for the first five cubic metres of water used by senior citizens with financial difficulties and individuals who receive the Social Welfare Bureau's single-parent or medical subsidies or subsidies for the disabled.

As at the end of 2023, Macao Water had 268,880 customer water meters, in 235,843 households, 30,550 companies and 2,487 government institutions.

Supporting Sustainable Development

As a public enterprise, Macao Water has taken up the social responsibility of caring, environment protection and sustainable development. Its corporate social responsibility committee is responsible for leading and supervising the consistent execution of sustainability initiatives in the company's operations and decision making. Since 2010, Macao Water has published an annual sustainable development report, as specified in the requirements of the Global Reporting Initiative (GRI), leading to Macao Water being awarded the "Content index service" logo.

Macao Water was honoured with the Best Sustainability Report for a Non-listed Company in Hong Kong ESG Reporting Award in the past, including the Best Sustainability Report Award for a Non-listed Company - Grand Award in 2019; the Best Sustainability Report Award for a Non-listed Company, Excellence in Environmental Positive Impact and Excellence in Social Positive Impact in 2020; and the Best GRI Report in 2021.

Starting from 2000, Macao Water was awarded the CNAS-CL01 (in compliance with ISO/IEC 17025) Accreditation Criteria for the Competency of Testing and Calibration Laboratories by Laboratory and Research Centre of Macao Water, ISO 9001 Quality Management System Accreditation, an ISO 45001 Occupational Health and Safety Management System certificate, an ISO 14000 Environmental Management certificate, an ISO 22000 Food Safety Management System Certificate, an ISO 50001 Energy Management System certificate, and an ISO 27001 Information Security Management System certificate.

Power Supply

Companhia de Electricidade de Macau

Companhia de Electricidade de Macau (CEM) is a public utility company with the sole concession to generate, transmit, distribute and sell high, medium and low voltage electricity in Macao. The total capacity of CEM's power generation equipment is 408 MW.

From 1906 to 1972, the electricity supply service was managed by the Macao Electric Lighting Company, headquartered in Hong Kong. In 1972, the company was replaced by CEM.

CEM was restructured with the former Portuguese administration's support in 1982. In 1984, CEM was linked to the Guangdong Power Grid through two 110 kV overhead lines. Cables of the power grid were modified, upgraded and added multiple times in 2006, 2007, 2008, 2015 and 2022. As a result, there are eight 220 kV power cables with a transmission capacity of 2,800 MVA, as well as four 110kV power cables with a transmission capacity of 500 MVA.

In November 2010, the Government and the CEM signed a contract stipulating a 15-year extension to power supply services. The new contract terms came into effect on 1 December 2010.

Since 1987, the Government, which was previously the largest shareholder in CEM, has reduced its holding to just eight percent. Currently, 63 percent of CEM's shares are owned by two major shareholders: Nam Kwong Development (HK) Limited, which holds 42 percent, and Energy Asia Consultancy Limited, which holds 21 percent. Moreover, Polytec Industrial Limited and Asiainvest (IP Holding) hold 11 percent and 10 percent, respectively. China Power International Holding holds six percent of the shares, and other investors own the remaining two percent.

Electricity consumption in Macao increased rapidly during the 1990s. In 1998, CEM decided to invest in developing Coloane B Power Station, which uses multi-cycle gas turbine technology.

Conditions of Operations

In 2023, CEM's capacity peaked at 1,067.7 MW on 31 May, 8.3 percent above the peak capacity in 2022.

The Macao electricity transmission network comprises 27 primary substations, eight high-voltage substations and 1,074 kilometres of 66 kV high-voltage cables, 110 kV cables and 220 kV cables. Connected by eight primary 220 kV transmission lines and four backup 110 kV transmission lines, the Guangdong-Macao electricity network forms a power transmission network structure with three 220 kV interconnections – in northern, central and southern Macao – for power transmission in Macao.

The 11 kV medium-voltage electricity transmission network comprises 1,718 user transformer rooms and 46 user substations, connected by 2,691-kilometre-long cables. The low-voltage transmission network comprises 1,027 kilometres of cable, while the street lighting network comprises 663 kilometres of cable and 16,571 streetlights. CEM's power network almost entirely comprises underground cables.

Electricity Output and Consumption

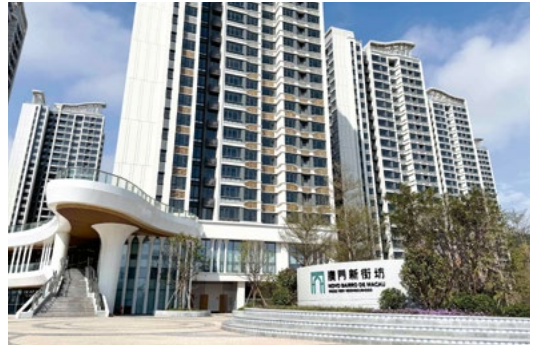
CEM generated 435.5 GWh of electricity during 2023, representing an increase of 7.2 percent from 2022. The amount of electricity imported from mainland China was 5,327.3 GWh, representing an increase of 9.3 percent over 2022, and accounting for 89.7 percent of total electricity consumption; and electricity purchased from the Macao Central Incineration Centre totalled 172.8 GWh. CEM's sales for 2023 totalled 5,733 GWh.

Customer Services

CEM established the CEM Customer Liaison Committee in 2000. With its members coming from 25 different community organisations, the committee serves to reflect public views of CEM's services, and to receive and make suggestions for improvement. At the end of 2023, CEM was providing services to 277,927 households. The Macao peninsula accounted for 80.01 percent of the total customer base; Taipa, 14 percent; Coloane, 5.92 percent; Cotai, 0.02 percent; and Hengqin, 0.05 percent.



Macao New Neighbourhood





After completion of the project to construct Macao New Neighbourhood in Hengqin, the residential units are launched for purchase at 9:00 am on 28 November. Macao New Neighbourhood is a major pilot project comprising quality living space, commerce, education, healthcare and social services. It extends Macao's standard public services to the Guangdong-Macao Intensive Cooperation Zone in Hengqin, and connects with Macao's social welfare facilities to create a liveable environment comparable to life in Macao.