

Land, Infrastructure, Housing and Public Utilities

Lands, Public Works and Transport Bureau

The Lands, Public Works and Transport Bureau (DSSOPT) is a public administrative authority that provides support to other branches of government in matters of land utilisation and management, urban planning, infrastructure, and basic services.

As stipulated in by-law No. 14/2022, the Land and Urban Construction Bureau (DSSCU) – restructured from the Lands, Public Works and Transport Bureau (DSSOPT) – commenced operation on 1 April 2022. The functions of the Public Works Department and Infrastructure Works Department under the former DSSOPT were transferred to the Public Works Bureau. Functions related to electrical and mechanical installations were added to the DSSCU, whereas functions related to urban planning, land management, approval and monitoring of private construction projects were retained.

Macao Urban Planning

Master Plan

The DSSOPT announced the summary report and the compendium of the public consultation regarding the draft version of Macao's Urban Master Plan (2020-2040). The summary report concluded that 1,265 submissions were received during the public consultation period. In all, 4,939 opinions were arranged and sorted according to the official consultation documents, for further classification and analysis.

In June, based on the DSSOPT's official public consultation document, summary report and compendium, the Urban Planning Committee provided written comments (a total of 19 comments collected from members) on the draft master plan. After comprehensive consideration of the views received during the public consultation and the views provided by the Urban Planning Committee, the DSSOPT completed the final report and submitted it to the Chief Executive.

As stipulated in Law No. 12/2013 - Urban Planning Law, and Law No. 5/2014 - Rules for the Implementation of the Urban Planning Law, on 13 September 2021 the Chief Executive decided to amend the draft master plan, with no major revisions involved; and on 12 November 2021 decided the draft master plan would be finalised.

In 2021, the draft master plan was completed and submitted to the Legal Affairs Bureau for follow-up regarding legislation. The draft master plan will be subject to approval by a supplementary by-law.

New Urban Zone Area A

In 2021, in response to the MSAR's public housing development plan and schedule, the DSSOPT carried out the Study on Optimisation and Urban Planning of New Urban Zone Area A, proposed plans for optimising land use, residential buildings, public facilities, infrastructure, transportation, green space, public space and landscaping, and formulated overall urban design guidelines and

plans for executing work, to meet the requirements for providing 32,000 residential units and related ancillary facilities in New Urban Zone Area A.

As specified in the draft version of Macao's Urban Master Plan (2020-2040), the function of the east side of New Urban Zone Area B has been revised to a commercial area. The DSSOPT continued the Study on Optimisation and Urban Planning of New Urban Zone Area B, to propose plans for optimising land use, public facilities, infrastructure, transportation and landscaping, and formulate overall urban design guidelines.

Project Plans

As regards the revision of the overall planning of Macao border checkpoints and their environs, the research unit finished compiling the final study report, which covers nearby places including the Border Gate Square and its bus terminal, the Police Tactical Unit headquarters, and the Macao Federation of Trade Unions Workers Stadium. This provides overall recommendations as well as plans for execution of work regarding land use, transportation planning, public facilities and infrastructure planning, and public open space.

During 2021, incorporating the results of immobile heritage assessments by the cultural authorities in the Report on the Overall Plan for Flood Prevention and Drainage on the west side of Coloane, the DSSOPT continued to expedite the planning of the Coloane Lai Chi Vun and Rua dos Navegantes Promenade, to inherit the history of Macao's shipbuilding industry as a fishing village, and optimise the environment of Lai Chi Vun shipyards and western Rua dos Navegantes, thus highlighting the leisure environment of Coloane's old town and its beautiful waterfront.

Planning Condition Drafts

Urban planning conditions for districts lacking detailed planning are being compiled by the DSSOPT in accordance with the Urban Planning Law and the Rules for the Implementation of the Urban Planning Law. During 2021, 95 sets of planning conditions for urbanisation management were issued.

Construction Companies and Contractors

According to DSSOPT statistics, as at the end of 2021, a total of 1,458 companies (urban construction), companies or individual business owners (urban construction and urban planning), companies (gas) and construction contractors (urban construction) were legally registered or had their registration renewed, with details as follows:

Category		New registration	Renewed registration	Total
Companies (urban construction)	Construction	97	967	1,064
	Fire	1	75	76
	Sub-total	98	1,042	1,140

(Cont.)

Category		New registration	Renewed registration	Total
Companies or individual business owners (urban construction and urban planning)	Plan drafting Construction supervision Construction monitoring	19	67	86
	Fire	0	3	3
	Sub-total	19	70	89
Companies (gas)		2	550	52
Construction contractors (urban construction)		7	170	1177
Total		126	1,332	1,458

Technicians

Technicians, including engineers and architects, are categorised according to their professions in the above-mentioned law. By the end of 2021, the number of valid registrations for ten types of technicians and engineers totalled 782 person-times, with seven people who each held two professional titles. Details are as follows:

Category		New registration	Renewed registration	Total
Technicians (construction and urban planning)	Architects	2	125	127
	Landscape Architects	0	1	1
	Civil Engineers	17	340	357
	Fire Engineers	0	7	7
	Electrical Engineers	3	84	87
	Electrical and Mechanical Engineers	2	116	118
	Mechanical Engineers	1	67	68
	Chemical Engineers	0	6	6
	Industrial Engineers	0	0	0
	Fuel Engineers	0	2	2
	Engineering Technicians	0	9	9
Total	25	757	782	

Infrastructure Projects

Private Construction Projects

According to DSSOPT statistics, in 2021, 19 building projects providing 2,393 residential flats with a total floor area of 181,109 square metres, 116 commercial units with a total floor area of 12,687 square metres, 11 offices with a total floor area of 4,640 square metres, one industrial/warehouse unit with a total floor area of 16,625 square metres, and 1,390 parking spaces (1,079 for private cars and 311 for motorcycles) in car parks, with a total area of 40,287 square metres, were completed.

During 2021, construction commenced on 26 private projects providing 445 units with a total floor area of 31,741 square metres, 38 commercial units with a total floor area of 12,193 square metres, nine office units with a total floor area of 1,223 square metres, one industrial/warehouse unit with a total floor area of 2,165 square metres, and 369 parking spaces (251 for private cars and 118 for motorcycles) in car parks, with a total area of 40,287 square metres.

By the end of 2021, 2,448 units were under construction, of which 2,241 were residential units with a total floor area of 160,070 square metres, 191 were commercial units with a total floor area of 31,104 square metres, 14 were office units with a total floor area of 2,085 square metres, two were industrial/warehouse units with a total area of 3,222 square metres; as well as 1,720 parking spaces (1,222 for private cars and 498 for motorcycles) in car parks, with a total area of 55,306 square metres.

During the year, a total of 8,141 units were still in the design phase, of which 7,372 were residential units with a total floor area of 543,946 square metres, 762 were commercial units with a total floor area of 160,243 square metres, three were office units with a total floor area of 1,970 square metres, and four were industrial warehouses with a total floor area of 19,156 square metres; as well as 6,834 parking spaces (5,140 for private cars and 1,694 for motorcycles) in car parks, with a total area of 228,546 square metres.

In 2021, 9,549 applications were received for private construction projects, of which 2,087 were for demolition/ maintenance/ renovation, 2,368 were for simple projects in common parts of buildings, food and beverage establishment integrated construction projects, and construction licences, and 639 were for construction/expansion.

During the year, 9,459 applications from 2021 and the previous year were handled, a majority of which were in the above-mentioned three major categories: 2,397 applications for simple projects in common parts of buildings/integrated construction projects for food and beverage establishments/ construction licences, 2,186 applications for demolition/maintenance/renovation projects, and 667 applications for construction/expansion projects.

Construction Document Certification

In 2021, the DSSOPT's general archive unit handled 5,950 applications for certification of construction documents with approved licences.

Public Construction and Infrastructure Projects

The DSSOPT followed up on a number of public works projects in 2021, with 46 projects commenced and 38 projects completed during the year. Among them, five projects cost over 2.5 million patacas, including renovation of the exhibition hall and offices of the China-PSCs Commercial and Trade Service Platform Complex, restoration of the infrastructure at the bottom of the Outer Harbour Ferry Terminal, improvement of lighting facilities at the Friendship Bridge, and design and construction of official residences of the Estrada de Santa Sancha; 41 projects cost below 2.5 million patacas, including improvement, maintenance, waterproofing, fence installation, and demolition of dangerous old buildings and illegal structures.

Projects completed in 2021 included several projects that had commenced in previous years, notably the design and construction of a carpark at the Legislative Assembly Square, which commenced in 2018; construction of a temporary Ilha Verde Fire Station, renovation of Portas do Entendimento (Gate of Understanding), and reconstruction of the office of the Macao Security Forces Shooting Range in Coloane, which commenced in 2019; renovation of the Public Security Forces Affairs Bureau Building facilities and power system optimisation, and renovation of the Government Printing Bureau Building, which commenced in 2020.

In 2021, 24 services were provided, including the compilation of project plans for renovation of 5/F, Qingmau Checkpoint Building and renovation of the permanent file storage at the Government Information Bureau; monitoring restoration of the infrastructure at the bottom of the Outer Harbour Ferry Terminal, and renovation of the exhibition hall and offices of the China-PSCs Commercial and Trade Service Platform Complex; and services for other projects including quality control, testing and soil investigation. During the year, two open tendering exercises for services for cross-harbour bridges were conducted, including maintenance of lighting of Carvalho Bridge, Friendship Bridge, Lotus Flower Bridge and Sai Van Bridge.

On the infrastructure front, the Government continued following up regarding the plans for flood prevention and drainage, road network implementation, sewer improvements, cross-harbour bridges and slope monitoring and maintenance.

In 2021, two studies and six design projects were completed, three design projects commenced, 32 construction projects were completed, and 37 constructions projects commenced. Two of these projects were relatively large-scale and involved public tenders.

To eliminate flood and drainage problems of Macao in the long-term, the DSSOPT finished drafting the plan for the project to construct a rainwater pumping station and sewer works at the Inner Harbour, and the report on Real Time Digital Modelling for Effectiveness Certification of the Sluices in the Inner Harbour. Based on the modelling results, the sluices can hold back sea water during storm surges, and better protect the waterfront area of the Inner Harbour.

Other smaller districts also started flood prevention and drainage projects, including the completion of the Flood Prevention Facility Construction along the Coast from Fai Chi Kei to Ilha Verde and the Feasibility Study on Flood Prevention and Drainage at West Coloane.

The infrastructure work involving sewers, road transport networks, cross-harbour bridges and slopes mainly comprises:

1. Studies, including:

- Nobre de Carvalho Bridge – Preliminary Design, Engineering Investigations and Study on the Construction of Two Cross-harbour Tunnels and Feasibility Study on Flood Prevention and Drainage at West Coloane.

2. Project plans, including:

- Construction of a cross-harbour tunnel in New Urban Zone Area A and Area B – preliminary design;
- Construction of a bridge connecting New Urban Reclamation Zone A and Macao Peninsula (A2);
- Lift construction at the flyover on Avenida do Dr. Rodrigo Rodrigues;
- Avenida Dr. Sun Yat-Sen tunnel exit project – preliminary design;
- Construction of a bridge connecting New Urban Reclamation Zone A and Macao Peninsula (A3) – feasibility study and preliminary design;
- Construction of a flyover on Avenida de Venceslau of Morais;
- Expansion of the Seac Pai Van Reservoir in Coloane;
- Road construction near Avenida da Harmonia – compilation of project plan; and
- Construction of a rainwater pumping station and sewer works at the Inner Harbour.

3. Monitoring projects, including:

- Monitoring Structural Safety of Sai Van Bridge, Friendship Bridge and Nobre de Carvalho Bridge; and
- On the slope front, slope data collection continued through the automatic monitoring system at Taipa Grande and Mount Fortress slope.

4. Construction works, including:

- Continued works on new roads near Avenida Marginal Flor de Lotus, Taipa; construction of the Skywalk at Avenida de Guimaraes on Taipa; maintenance of girders and bolsting the base of Friendship Bridge; design and construction of a pedestrian system around Guia Hill; improved pedestrian flows along Taipa Avenida Padre Tomas Pereira; road works at Vala das Borboletas, Coloane; and dike improvement works near Avenida Panorâmica do Lago Sai Van; and
- New projects near Avenida da Harmonia; design and construction of sewage interceptors at the Outer Harbour Reclamation Area (NAPE); New Urban Zone Area E1 eastern road and drainage system construction; sewer works at Avenida de Venceslau of Morais; extension and structural strengthening of Nobre de Carvalho Bridge guardrail; and design and construction of roads neighbouring the new dangerous goods warehouse.

Infrastructure project	Number of projects commenced	Number of projects completed
Study	0	2
Design	4	6
Construction	37	32

Infrastructure Development Office

Established in 2000, the Infrastructure Development Office is responsible for fostering and coordinating the execution, maintenance, modernisation and development of major constructions projects implemented in the Macao SAR, as well as research, follow-up work and implementation of cooperative construction projects within the Greater Pearl River Delta region.

In October 2019, the Infrastructure Development Office took over projects that were originally handled by the former Transportation Infrastructure Office, and continued pushing forward with the development of the Light Rail Transit (LRT) System.

The Public Works Bureau (DSOP) commenced operation on 1 April 2022 according to Executive Order No. 13/2022. The functions of the Infrastructure Development Office and DSSOPT's Public Works Department and Infrastructure Works Department were transferred to the Public Works Bureau.

Hospitals/Government Departments

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 420,000 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. Construction of the nursing academy has been completed. Topping out ceremonies have been held for the hospital complex, auxiliary building, general service administrative building and staff dormitory. The construction of the central laboratory building is underway.

Phase 1, Conde S. Januario Hospital Expansion Project - Public Health Specialist Building

Construction of the expansion project superstructure commenced in January 2021. With isolation

wards, surgery rooms, laboratories and observation rooms, the expansion building has a passageway linked to the main Conde S. Januario Hospital, and will improve medical and health care facilities, while raising the level of medical services.

New Public Security Police Headquarters Building and New Police Tactical Unit Headquarters Building

Construction of the New Public Security Police Headquarters Building and New Police Tactical Unit Headquarters Building, at the Macao New Urban Reclamation Zone E1, commenced in January 2021. The office building and underground car parks were constructed to meet the operational needs of relevant departments.

New Customs Service Headquarters Building, Taipa

Construction of the New Customs Service Headquarters Building, at the Macao New Urban Reclamation Zone E1, commenced in January 2021. The office building and underground car parks will meet the operational needs of relevant departments.

Road Infrastructure

Coloane-Ka Ho Tunnel

The Coloane-Ka Ho Tunnel project was constructed in three parts: the tunnel section, south exterior section, and north linkage section. The project was completed in November 2021, and commenced operation on 10 December 2021.

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 A, links with the Artificial Island of the Hong Kong-Zhuhai-Macao Bridge, and ends at Macao New Urban Reclamation Zone 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.

Construction commenced in 2020 and is underway. In tandem with work on the bridge, construction of the road networks connecting either end of the bridge has commenced. These comprise the Pac On linkage at New Urban Zone Area E and the Avenue Wai Long linkage, with construction commencing in April 2021, and the Hong Kong-Zhuhai-Macao Bridge Artificial Island linkage and New Urban Zone Area A eastern linkage, construction of which commenced in August 2021.

Public Housing Projects

To meet the people's housing needs, the Infrastructure Development Office has launched 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; the, second phase of the Mong Ha Public Housing project; and reconstruction of the sports centre.

Public housing projects that are underway include: Rua Central De Toi San Public Housing Estate; Avenida de Venceslau of Morais Public Housing project, and B4, B9 and B10 of New Urban Zone Area A public housing phase 1. Tender procedures for the public housing design and construction on the five plots “A1”, “A2”, “A3”, “A4” and “A12” in the New Urban Zone Area A were completed in September and October 2021.

To implement the housing scheme for senior citizens proposed in the policy address, construction of around 1,800 studio apartments (T0) and the auxiliary social service facilities is underway, on a 6,828-square-metre piece of land adjacent to Avenida Nordeste in Areia Preta.

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. Reclamation and dyke works of Area C and Area D are in progress.

Cross-border Cooperation Projects

New Guangdong-Macao Border Crossings

Construction of a new Guangdong-Macao border crossing is one of the Guangdong-Macao cooperation projects. It mainly includes construction of a new border checkpoint (Qingmao Checkpoint), a border crossing channel, and the Canal dos Patos improvement works. The projects were completed in May 2021, and commenced operations on 8 September 2021.

Access bridge connecting the University of Macau and the Hengqin Border Post of the University of Macau

Located to the south of the Lotus Flower Bridge, the access bridge connects the traffic platform at the Hengqin Port, which is under Macao jurisdiction, and the University of Macau campus. Vehicle and pedestrian passageways have been constructed for teachers, students and staff of the University of Macau, enabling them to travel between the Hengqin Port and alleviate the need to rely on the University of Macau Underwater Tunnel. Construction commenced in December 2021.

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. The stations are “HE1 Station”, next to Lotus Flower Bridge Station on the current Taipa Line; and “HE2 Station”, at the basement of Hengqin Port. Construction commenced in March 2021.

LRT Project

The LRT Taipa line commenced operations in 2019. Construction of the Taipa line linkages to Macao peninsula and Barra Station is underway. Construction of the 1.6-kilometre Seac Pai Van line commenced in September 2021; it passes through Taipa-Coloane Causeway, Rotunda de Seac Pai Van and Estrada de Seac Pai Van, and has two stations: Seac Pai Van Station and Islands District Medical Complex Station.

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; rationally allocate public rental housing resources to underprivileged families in need; 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 construction of Home-Ownership Scheme Housing is led by the Government and executed by the Housing Bureau or other public authorities appointed by the Chief Executive.

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 process of allocating 1,900 multiple-room Home-Ownership Scheme housing units to those who submitted general applications at the end of 2013 is still under progress. As at 31 December 2021, a total of 1,883 family applicants were allocated housing units.

General application for 3,011 housing units began at the end of November 2019. The first batch of detailed assessments was completed in July 2021, with 2,307 eligible applications, 429 applications under legal procedures, 199 ineligible applications, 44 withdrawn applications, and 32 applications with changed priorities. This was followed by the second batch of detailed assessments, with 700 accepted applications.

A new phase of general application for 5,254 housing units was conducted from 14 July to 30 November 2021. A total of 11,707 applications were received. Detailed assessments were conducted accordingly. The priority list will be announced in 2022.

Public Housing

Public housing units are distributed in the form of leasing by the Government to families of weak financial standing or with special difficulties. 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

The Housing Bureau launched a new round of open applications for public housing in November 2017. After a review of the applications, a waiting list was announced in February 2019, covering 6,355 households. As at 31 December 2021, 3,627 households had been allocated housing, and 2,325 households gave up their applications or were delisted.

Public housing was open for ongoing application from 20 August 2020 onwards. As at 31

December 2021, the Housing Bureau received a total of 4,431 applications, 1,976 of which were accepted and 1,288 were withdrawn or rejected.

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 2021, the bureau handled 3,470 cases of Home-Ownership Scheme management-related affairs, fostered 94 management bodies of Home-Ownership Scheme housing that are already in place and operating effectively, and handled 4,713 cases involving the general assembly of owners of strata-title buildings under the Home-Ownership Scheme and affairs regarding the operations of management bodies. There were 6,181 cases of technical assistance provided for the management of private housing common areas.

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 at 31 December 2021, a total of 236 licences for commercial management of strata-title buildings had been issued.

The Property Maintenance Fund

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

In accordance with the Executive Order, the seven schemes were consolidated into four schemes, together with expanding coverage of the subsidies and increasing the amount of subsidies. This amendment came into effect on the day following its promulgation on 29 November 2021.

As at 31 December 2021, 548 applications for the seven schemes under the Property Maintenance Fund were approved, with subsidies totalling over 36 million patacas. A total of 5,030 applications have been approved since the establishment of the fund, granting subsidies totalling 485 million patacas.

Joint Centre for Building Leakage Issues

Through cross-departmental cooperation among the Lands, Public Works and Transport Bureau, Municipal Affairs Bureau, Health Bureau, Legal Affairs Bureau and Housing Bureau, the Government established the Joint Centre for Building Leakage Issues on 1 February 2009. The centre provides one-stop assistance to owners of flats that are origins of leaks to encourage maintenance. In 2021, 1,811 cases were filed for investigations; and there was follow up work on 3,081 cases*, 2,520 of which were completed**.

* Total number of new and old cases pending processing to date

** Total number of cases completed in 2021

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 2021, five squatter dwellings were demolished. By the year-end, 411 squatter dwellings remained, of which 184 were on the Macao peninsula and 227 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.

Issuing Relevant Licences

As at 31 December 2021, the numbers of licences issued for real estate agents and brokers totalled 2,467 and 9,759, respectively.

Supervision

To facilitate the implementation of laws and various tasks, during 2021 about 2,368 inspections were conducted in business premises of real estate agents, and about 66 inspections were conducted at strata-title buildings, to check the compliance with the Real Estate Agency Law and Strata-title Buildings Management Commercial Operation Law among real estate agencies and strata-title building management companies, and to initiate disciplinary proceedings against alleged administrative irregularities. Complaints about real estate agents, brokers and strata-title building management company owners were received and handled in accordance with the relevant laws.

During 2021, 52 cases involving real estate agents, 13 cases involving real estate brokers, and 35 cases involving strata-title building management company owners resulted in penalties for breaking the law.

Land Management

Lands Committee

The Lands Committee is a consultative body whose work is supervised by the Secretary for Transport and Public Works. The committee is responsible for advising on land use by recipients of land grants, in terms of legal and contractual obligations. It also advises on fines or other penalties for land grant recipients who fail to comply with the laws and terms of their contracts; cases concerning the public use of granted land; and granting, renewing, renouncing or cancelling temporary land-occupation licenses.

Land Concessions

According to the DSSOPT's statistics, 12 land grant contracts were completed, one order for land exchange was cancelled and four orders for land return were issued in 2021. These contracts were as follows:

- Leases and grants: two contracts, with newly granted area of 47,682 square metres, involving a total floor area of 47,770 square metres;
- Long-term leases: eight contracts, involving a total floor area of 2,028 square metres;
- Gratuitous concessions: two contracts, with a new area of 10,005 square metres, involving a total floor area of 10,005 square metres;
- Order of land exchange cancellation: one contract, with an area of 4,648 square metres; and
- Returned land: four contracts, all being annulled contracts involving a total floor area of 12,084 square metres.

The land granted in 2021 was mainly for residential, commercial, hotel, car parking, social facility and other development uses. The premiums under land grant contracts during the year totalled 1,469,803,866 patacas. Actual income received from land premiums during the year totalled 1,445,466,527 patacas.

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 information from the DSSOPT, the transition period prescribed in Law No.1/2015 has already finished. Now 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 2021, 30 people were approved for professional registration after second review; they were from architecture, civil engineering, electrical engineering, electrical and mechanical engineering, mechanical engineering and environmental engineering disciplines. In total, since the enforcement of the law till the end of 2021, accredited professionals in the 13 disciplines totalled 2,631, with the breakdown as follows:

Professions	Numbers of registered professionals (2021)	Numbers of registered professionals (2015-2021)
Civil Engineering	18	1,072
Architecture	4	418
Electrical and Mechanical Engineering	4	319
Electrical Engineering	1	314
Mechanical Engineering	1	276
Environmental Engineering	2	93
Urban Planning	0	58
Chemical Engineering	0	22
Traffic Engineering	0	19
Fire Engineering	0	18
Landscape architecture	0	17
Industrial Engineering	0	3
Fuel Engineering	0	2
Total	30	2,631

In 2021, a total of 140 practitioners of various professional disciplines received council approval to join internships. At the end of 2021, the number of practitioners since the law came into effect was over 693, with details as follows:

Professional Discipline	Number of Interns (2021)	Number of Interns (2015-2021)
Civil Engineering	57	368
Architecture	25	110
Electrical and Mechanical Engineering	21	98

(Cont.)

Professional Discipline	Number of Interns (2021)	Number of Interns (2015-2021)
Electrical Engineering	22	59
Mechanical Engineering	12	40
Environmental Engineering	2	10
Urban Planning	0	3
Fire Engineering	0	2
Landscape architecture	1	3
Total	140	693

In 2021, a total of 63 practitioners of various professional disciplines received council approval to register themselves as internship instructors. At the end of 2021, the number of instructors since the law came into effect was 605, with details as follows:

Professional Discipline	Number of internship instructors (2021)	Number of internship instructors (2015-2021)
Civil Engineering	23	255
Architecture	7	110
Electrical and Mechanical Engineering	14	105
Electrical Engineering	9	57
Mechanical Engineering	7	51
Environmental Engineering	2	11
Urban Planning	0	6
Fire Engineering	0	6
Chemical Engineering	0	1
Landscape architecture	1	1
Fuel Engineering	0	2
Total	63	605

In 2021, a total of 118 practitioners of nine professional disciplines were approved for qualifying examinations. At the end of year, the total number since the law came into effect was 282, with details as follows:

Professional Discipline	Number of practitioners eligible for qualifying examinations (2020)	Number of practitioners eligible for qualifying examinations (2015-2020)
Civil Engineering	68	170
Architecture	16	43
Electrical and Mechanical Engineering	13	33
Electrical Engineering	10	19
Mechanical Engineering	4	8
Urban Planning	3	3
Environmental Engineering	2	4
Fire Engineering	1	1
Landscape architecture	1	1
Total	118	282

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 candidateship, 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 two qualifying examinations during 2019-2020, with 85 candidates passing the examination and obtaining professional qualifications. The 2021 qualifying examination – a written test – was held in December, and was attended by 172 candidates from nine professions: architecture, civil engineering, electrical engineering, electrical and mechanical engineering, mechanical engineering, landscape architecture, fire 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 2021, the Urban Planning Committee followed up on and discussed planning conditions in 99 cases. In accordance with the provisions of Law No. 12/2013 – Urban Planning Law, the committee listened to a briefing on the summary report on the consultation regarding the draft version of Macao’s Urban Master Plan (2020-2040) in May and June 2021, and held discussions and provided suggestions. In September, the committee held discussions and provided suggestions on the draft by-law on land classification and utilisation.

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.

In 2021, during a plenary meeting, the Urban Renewal Committee listened to a briefing on the consultation services for Macao’s urban renewal; it also exchanged opinions on progress with replacement and temporary housing projects of Macau Urban Renewal Limited.

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.

In accordance with Executive Orders No. 103/2020 and No. 48/2021, eight members were appointed to form the Cross-department Committee, with a three-year tenure. Members included the Director of the DSSOPT, who was appointed as the coordinator, and representatives from the Cultural Affairs Bureau, the Municipal Affairs Bureau, the Transport Bureau, the Infrastructure Development Office, the Environmental Protection Bureau, the Housing Bureau and Macao Government Tourist Office.

In 2021, the Cross-department Committee attended the plenary meeting of the Urban Planning Committee, listened to the committee members’ opinions, and provided advice on the draft, summary report and compendium of Macao’s Urban Master Plan (2020-2040).

The Cross-department Committee also listened to the research team’s briefing on the public opinions collected during the public consultation regarding the draft version of Macao’s Urban Master Plan (2020-2040), and summarised and analysed the opinions from members of the Urban Planning Committee, while striving to expedite the completion of the draft plan for legislation.

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 2021										
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		106334.33	110357.44	60375.70	18638.18	16938	11881	181	26	31
Taipa		33371.62	62444.25	432.67	26966.75	5402	3877	76	1	24
Coloane		25806.74	29759.26	0	16216.90	2096	1802	59	1	18
Total		165512.69	202560.95	60808.37	61821.83	24436	17560	316	28	73

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 2021, the Drainage Division received 2,666 complaints, 10.85 percent more than in 2020. Among these, 2,186 cases were the responsibility of the Drainage Division, and the other 480 involved drainage blockages on private areas or were under the purview of other public departments. Moreover, the Drainage Division commenced 52 prosecutions concerning violation of the General Regulations Governing Public Places, and 335 subpoenas were issued to alleged polluters.

Slopes

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 DSSOPT liaises with the related property owners, in order to implement measures in accordance with the advice of the slope safety task force.

The slope safety task force mainly comprises engineers from the DSSOPT, the Municipal Affairs Bureau and the Macao Civil Engineering Laboratory. The DSSOPT and Municipal Affairs Bureau are responsible for maintenance of roads and slopes, respectively.

According to the DSSOPT's statistics, there were 258 risky slopes throughout Macao in 2021. During the year, the DSSOPT conducted one slope improvement project, and the Municipal Affairs Bureau followed up on 10 slope improvement projects.

Number of slopes / risk	High	Medium	Low	Total
Macao peninsula	1	33	80	114
Taipa island	2	26	40	68
Coloane island	3	19	54	76
Total	6	78	174	258

In 2014, the DSSOPT 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 DSSOPT, enabling early precautionary measures and alerts.

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

Convenient Public Services

By the end of 2021, services available for online applications for the construction and engineering industry included application for construction documents, application for authentication of construction documents (with permits), internship instructor registration, application for accreditation of continuing education activities - technician, application for accreditation of continuing education activities - training entities, and professional qualification recognition and registration.

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.

Cadastral 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

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); and effectively cover the whole of Macao, further enhancing land, cadastral and engineering surveys of Macao, as well as data collection for the Geographic Information System (GIS).

In 2009, the Macao Satellite Positioning Reference Station Service (mosref.dscg.gov.mo) was launched, making satellite reference data officially available to the public, through registration. In addition, an NTRIP (Networked Transport of RTCM via Internet Protocol) service was 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 provided 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 2021, the website had received over 1.54 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 eating, housing, transportation, sports and recreation.

To accord with the Government's policy to create an accessible environment, nine walking routes were included in the Macao Online Map, providing information on recommended walking routes and time 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 2021, the online map has received more than 7.5 million visitors.

In 2014, the Cartography and Cadastre Bureau introduced the Macao Street Number Inquiry System (webmap.gis.gov.mo/AddressSearch/chn), which provides a street number inquiry service.

In line with the development of information technology and in response to public demand, in 2012 the Cartography and Cadastre Bureau introduced the Macao Map 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 Macao Map was published in 2018, with enhanced route planning function integrating all smart footpaths and vehicle road networks throughout Macao, providing the shortest routes of four travel categories – walking, leisure, bus routes and driving.

GeoGuide for Emergency is a mobile geographical iOS / Android app 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 Affairs Bureau (DSEJ), the Social Welfare Bureau and the Municipal Affairs Bureau. In 2021 an updated version was launched, providing the public with important geographic information about regions that may be affected during all levels of storm surge, 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.

The Traffic and Geographic Information Web (traffic.gis.gov.mo) is a cooperative project between the Cartography and Cadastre Bureau and the Transport Bureau, providing locations of roadworks in progress or to soon commence, and related traffic diversions in Macao.

The Environmental Geographic Information System (gis.dspsa.gov.mo) was jointly created by the Environmental Protection Bureau and the Cartography and Cadastre Bureau for the provision of shared map service. The system publishes environmental data and related processed information through the Internet.

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.

Electric Power

To improve the transmission facilities in some old districts, from 2015 to the end of 2021, a total of 12 temporary transformer rooms and transmission facilities have been constructed and put into operation in the old districts. In addition, the substations constructed in new buildings, as well as changes in community and commercial activities, solved the issue of inadequate power supply in old districts.

As regards preventing and responding to disasters, the Government followed up on the comments and recommendations of the National Commission for Disaster Reduction's Expert Group. As a result, to ensure external power supplies, China Southern Power Grid enhanced the wind resistance of its power grid, added sources of power as well as complementary supplies. Underground works for major power supply routes from mainland China to Macao were launched, to further increase the reliability of cross-border power supplies. Moreover, the Government continued to press forward with the construction of the substation for the third Guangdong-Macao high-voltage electric power transmission channel, which can further improve power transmission capacity and ensure safe and stable power supplies, to meet the needs of Macao's social and economic development in the medium to long term. As regards the enhancement of transmission networks in low-lying areas, over 218 substations were improved in 2021.

In 2021, to lower burdens on residents, the Government continued to offer the electricity fee subsidy of 200 patacas per month per household.

Natural Gas

Following the completion of the natural gas pipeline network in Cotai, the construction of the Macao-Taipa cross-harbour gas supply pipeline commenced. The gas supply network is expected to be extended to the southern part of the Macao peninsula, improving the gas supply network in the southern and northern parts of the Macao peninsula. In 2021, gas supply was introduced to the

Macao peninsula. Mong Tak Building took the lead in adopting natural gas. By the end of 2021, 19.3 kilometres of the 34-kilometre natural gas trunk pipe network construction on the Macao peninsula had been completed, representing a 57 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. By the end of 2021, there were 2,407 electric vehicles in Macao, including 1,813 light vehicles, 261 heavy vehicles, 274 heavy motorcycles and 59 light motorcycles.

Since the launch of the initiative to install light-vehicle charging spaces at public car parks in 2016, the objective of installing 200 public charging spaces as specified in The Five-Year Development Plan of the Macao Special Administrative Region was met by 2020. These light-vehicle charging spaces span 42 public car parks and seven public roads, providing free charging services.

The Environmental Protection Bureau and relevant departments planned the next stage of the public charging parking space, and reviewed and optimised the application procedures and guidelines for charging spaces in private car parks.

To promote energy-saving LED lights, the Government established a street light replacement plan, to replace the 14,000 standard high-pressure sodium street lights in Macao with LED lights, to save energy and for aesthetic enhancement and safety. By the end of 2021, the replacement plan was essentially completed; the LED street lights accounted for about 54 percent of Macao's street lights.

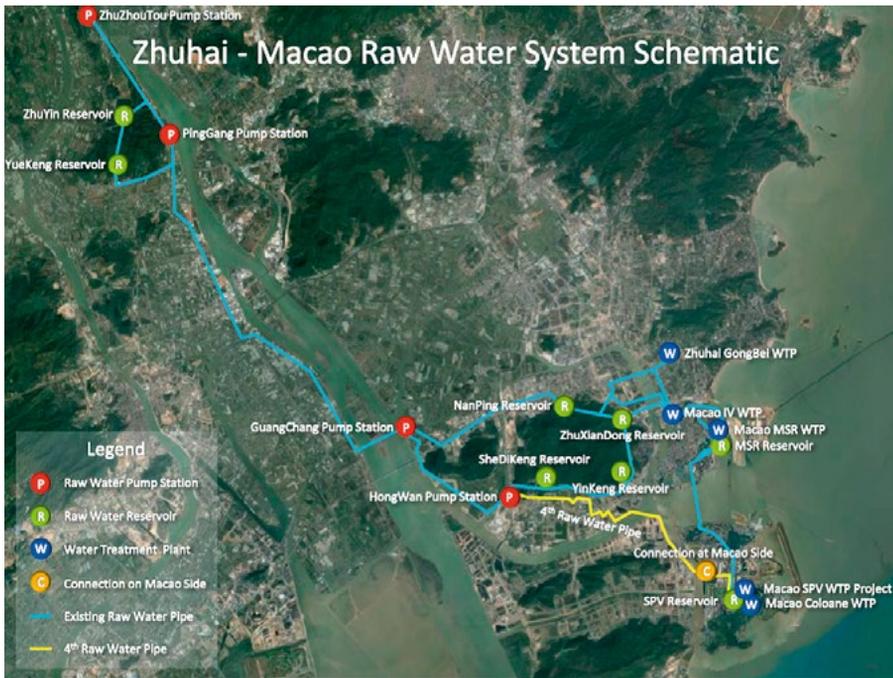
Drinking Water

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 and the Seac Pai Van Reservoir in Macao, and Zhuxiandong Reservoir, Nanping Reservoir, Shedikeng Reservoir in Zhuhai. To mitigate salinity effects, the Zhuyin Reservoir was built in Pinggang, with a total volume of 43 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 transfers raw water to Seac Pai Van Reservoir directly from Hongwan pumping station.

In 2021, Zhuhai supplied about 260,000 cubic metres of water to Macao each day, which totalled 94.95 million cubic metres of raw water throughout 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 76,000 cubic metres. In 2021, the total length of main pipelines was 640 kilometres.

At the end of 2021, the total volume of raw water stored in Macao's reservoirs (including the Main Storage Reservoir, the Outer Harbour Reservoir and the Seac Pai Van Reservoir) was 1.92 million cubic metres, including 1.68 million cubic metres in the reservoir near the Outer Harbour.

A total of 92.7 million cubic metres of water were supplied in 2021, 0.3 percent less than in 2020. The daily average volume supplied in 2021 was around 254,000 cubic metres, with a maximum of 283,000 cubic metres recorded on 27 July. In 2021, the total capacity of water sales was 86.31 million cubic metres, with a daily average of 236,000 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, and an official WeChat account, 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 2021, Macao Water had 266,383 customer water metres, in 233,828 households, 30,060 companies and 2,495 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 "Services Institution with Verified Disclosure" logo. In 2019 and 2020, Macao Water was honoured with the Best Sustainability Report for Non-listed Company in Hong Kong ESG Reporting Awards.

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 and 2015. As a result, there are six 220 kV power cables with a transmission capacity of 2,100 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 2021, CEM's capacity peaked at 1,037 MW on 28 July, 8.6 percent higher than the peak capacity in 2020.

The Macao electricity transmission network comprises 26 primary substations, eight high-voltage substations and 1,030 kilometres of 66 kV high-voltage cables, 110 kV cables and 220 kV cables. The Guangdong-Macao electricity network included two 110 kV cables and two 220 kV cables. The 110 kV cables were connected to Gongbei Substation and Nanping Substation, while the 220 kV cables were connected to Zhuhai Substation and Qinyun Substation.

The 11 kV medium-voltage electricity transmission network comprises 1,618 user transformer rooms (11 kV/400 V) and 43 mid-voltage substations, and is connected by cables with a total length of 2,504 kilometres. The low-voltage transmission network comprises 986 kilometres of cable, while the street lighting network comprises 581 kilometres of cable and 15,918 streetlights. CEM's power network almost entirely comprises underground cables.

Electricity Output and Consumption

CEM generated 287 GWh of electricity during 2021, representing a decrease of 23 percent from 2020. The amount of electricity imported from mainland China was 5,192 GWh, representing an increase of seven percent over 2020, and accounting for 91.9 percent of total electricity consumption; and electricity purchased from the Macao Central Incineration Centre totalled 170 GWh. CEM's sales for 2021 totalled 5,443 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 2021, CEM was providing services to 274,649 households. The Macao peninsula accounted for 80.3 percent of the total customer base; Taipa, 13.85 percent; Coloane, 5.79 percent; Cotai, 0.01 percent; and Hengqin, 0.05 percent.



香港體育館
Mong-Ha Sports Centre

Mong-Ha Sports Centre





Mong-Ha Sports Centre has a total floor area of about 8,900 square metres and a height of 76.7 metres. It is a five-storey multi-functional sports venue, suitable for holding various events and providing users with space for exercise and different sports. The reconstruction of Mong-Ha Sports Centre was completed in 2021. Since June, its large gymnasium took the lead to serve the public as a community vaccination station, and was officially opened to the public on 2 December as a recreation and sport venue.