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**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.

In accordance with the principles and guidelines set out in the Macao Special Administrative Region Urban Development Strategy Study (2016-2030), and following the relevant legal and regulatory requirements set out in the Urban Planning Law, the DSSOPT commenced drafting Macao's urban development master plan in 2018.

The study of the New Urban Zone Area A was carried out as planned, resulting in 27 planning conditions being drafted in 2018. These mainly covered public housing units and areas for public facilities, with a view to providing 32,000 housing units and accommodating 96,000 people to meet the planning objectives, and providing the necessary facilities for supporting people's livelihoods.

New Urban Zone Area B has been designed for implementing the planned development of an administration and judicial zone, including the buildings for the Courts of Final Appeal, Second Instance and First Instance; and offices for the Macao Prosecutions Office, the Commission Against Corruption, the Commission of Audit, and the Unitary Police Services. The Government has been closely following up regarding preparations for building construction, including improvements to road and transportation plans in the vicinity, together with infrastructure and building facility layouts, and assessing the scale of each development, in order to proceed with the public infrastructure projects within the zone.

Regarding the New Urban Zone Area E1, which will feature a combination of residential, public and infrastructure areas, various road networks have been established, and locations of public and infrastructure facilities have been confirmed, based on existing plans. The draft planning conditions were also determined in line with the development of relevant facilities, for better overall development of New Urban Zone Area E1 together with its neighbouring regions.

Regarding the ongoing developments of small zone projects, the final report of the Macao Eastern District Coordinated Development Plan was completed. This contains proposals for practical major development projects involving transportation facilities, public facilities, infrastructure and public open areas, all of which have been compiled on the basis of coordinated development, in addition to following design guidelines and detailed planning.

The final report of the study on the future use and planning of the original site of Macao (Yat Yuen) Canidrome Club was also completed. This includes a set of planning and design guidelines for the future use of the Canidrome land plot, transportation layout guidelines, as well as conceptual planning of the overall landscape, green space and streets.

As regards the planning of the Coloane Lai Chi Yun and Rua dos Navegantes

Promenade, a follow-up study was conducted based on the results of immobile heritage assessments by the cultural authorities.

2018 also saw the commencement of the revised overall planning of the Macao border checkpoints and their neighbouring regions, involving an investigation of the transportation and land use of border checkpoint peripheries.

The DSSOPT also drafted the planning conditions of land zones without detailed planning, adhering to the procedures outlined in the Urban Planning Law and the Rules for the Implementation of the Urban Planning Law. In 2018, the DSSOPT issued 105 draft planning conditions (excluding the 27 planning conditions drafts of New Urban Zone Area A) to support urban development.

Construction Companies and Contractors

According to DSSOPT statistics, a total of 1,383 construction contractors and companies had registered or renewed their registrations by the end of 2018. With Law No.1/2015 – “Qualification System for Urban Construction and Town Planning” – coming into effect, the DSSOPT added data on categories and registrations of urban construction and town-planning companies. Details are as follows:

| Category | | New registration | Renewed registration | Total |
|---|------------------|------------------|----------------------|--------------|
| Construction Contractors (urban construction) | Construction | 125 | 842 | 967 |
| | Fire | 3 | 72 | 75 |
| | Sub-total | 128 | 914 | 1,042 |
| Companies (urban construction and urban planning) | Construction | 20 | 91 | 111 |
| | Fire | 2 | 10 | 12 |
| | Sub-total | 22 | 101 | 123 |
| Companies (gas) | | 3 | 31 | 34 |
| Construction contractors (urban construction) | | 9 | 175 | 184 |
| | Total | 162 | 1,221 | 1,383 |

Technicians

Technicians, including engineers and architects, are categorised according to their professions in the above-mentioned law. By the end of 2018, over 1,208 technicians in 11 construction related professions had registered or renewed their registrations, with details as follows:

| Category | | New registration | Renewed registration | Total |
|--|-------------------------------------|------------------|----------------------|--------------|
| Technicians (construction and urban planning) | Architects | 6 | 230 | 236 |
| | Landscape Architects | 1 | 3 | 4 |
| | Civil Engineers | 20 | 516 | 536 |
| | Fire Engineers | 2 | 6 | 8 |
| | Electrical Engineers | 16 | 89 | 105 |
| | Electrical and Mechanical Engineers | 13 | 163 | 176 |
| | Mechanical Engineers | 13 | 106 | 119 |
| | Chemical Engineers | 3 | 6 | 9 |
| | Industrial Engineers | 1 | 1 | 2 |
| | Fuel Engineers | 0 | 2 | 2 |
| | Engineering Technicians | 0 | 11 | 11 |
| | Total | 75 | 1,133 | 1,208 |

Infrastructure Projects

Private Construction Projects

According to statistics from the Lands, Public Works and Transport Bureau, in 2018, 32 building projects providing 4,158 residential flats with a total floor area of 458,996 square metres, 73 commercial units with a total floor area of 71,824 square metres, one industrial/warehouse unit with a total floor area of 10,351 square metres, and 4,429 parking spaces (3,343 for private cars and 1,086 for motorcycles) in car parks

with a total area of 151,169 square metres were completed. No office units were completed during the year.

During 2018, construction commenced on 22 private projects providing 1,071 units with a total floor area of 82,518 square metres, 106 commercial units with a total floor area of 12,010 square metres, 19 office units with a total floor area of 5,586 square metres, one industrial/warehouse unit with a total floor area of 16,925 square metres, and 570 parking spaces (442 for private cars and 128 for motorcycles) in car parks with a total area of 13,162 square metres.

By the end of 2018, 8,047 units were under construction, of which 7,659 were residential units with a total floor area of 705,824 square metres, 365 were commercial units with a total floor area of 64,752 square metres, 21 were office units with a total floor area of 6,780 square metres, and two were industrial warehouses with a total floor area of 17,982 square metres; as well as 7,987 parking spaces (4,984 for private cars and 3,003 for motorcycles) in car parks, with a total area of 216,244 square metres.

During the year, a total of 21,869 units were still in the design phase, of which 20,624 were residential units with a total floor area of 2,832,489 square metres, 1,217 were commercial units with a total floor area of 317,081 square metres, 23 were office units with a total floor area of 22,363 square metres, and five were industrial warehouses with a total floor area of 20,463 square metres; as well as 26,935 parking spaces (21,195 for private cars and 5,740 for motorcycles) in car parks, with a total area of 930,949 square metres.

In 2018, 8,512 applications were received for private construction projects, of which 2,286 applications were for demolition / maintenance / renovation, 821 were for simple projects in common parts of buildings, food and beverage establishment integrated construction projects, and construction licences, and 746 were for construction/expansion. During the year, 9,224 applications from 2018 and the previous year were handled, a majority of which were in the above-mentioned three major categories, including 2,187 applications for construction/expansion projects; 1,697 applications for demolition/maintenance/renovation projects, and 790 applications for simple projects in common parts of buildings, integrated construction projects for food and beverage establishments/construction licences.

Public Construction and Infrastructure Projects

To enhance the quality of various community facilities and government services, the Lands, Public Works and Transport Bureau followed up on a number of public works projects in 2018, with 75 projects commenced and 41 projects completed during the year.

Major projects that require open tendering include: the renovation of the government headquarters at Avenida do Conselheiro Ferreira de Almeida; renovation of the office floors of the Economic Services Bureau and the Legal and Judicial Training Centre, both

of which are in the Luso International Banking Building; renovation of the building façade and waterproof roofing of the Fire Service Sai Van Lake Station; and the maintenance and renovation of the office building of the Marine Enforcement Department of the Macao Customs in Ilha Verde.

There were 65 projects costing less than 2.5 million patacas, including five involving the demolition of dangerous old buildings, and 11 involving the demolition of illegal structures. Ten projects cost more than 2.5 million patacas.

Major projects completed in 2018 included 49 that commenced in previous years: one from 2014, three from 2016, four from 2017, and 41 from 2018. Among them, large-scale projects were the construction of Home for the Elderly and Convalescent Hospital Ka Ho, which commenced in 2014; the Outer Harbour Ferry Terminal boarding bridge replacement project and the reconstruction of the Fire Service Coloane Island Station, which commenced in 2016, and the renovation of a vehicle examination centre in Cotai and the offices on 21st and 22nd floors of Centro Golden Dragon, which commenced in 2017.

In 2018, work commenced on three planned projects: maintenance of the Meteorological and Geophysical Bureau office building, renovation of the office building of the Industrial and Commercial Development Fund of Macao on Rua de S. Domingos, and renovation of the Edifício Sede dos CTT on Estrada de D. Maria II. The public tendering process for each project proceeded smoothly.

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

In 2018, two studies were completed, three studies commenced, one design project was completed, seven design projects commenced, 44 construction projects were completed, and 41 constructions projects commenced. Five of these projects were relatively large-scale and involved public tendering.

In 2017 and 2018, to eliminate flood and drainage problems of Macao in the long run, the Lands, Public Works and Transport Bureau completed the Masterplan for Flood Prevention and Drainage at the Promenade of Inner Harbour of Macao and consulted relevant national ministries. In 2018, the masterplan was approved by the State Council.

The next-stage Feasibility Study on Sluices at the Inner Harbour of Macao: Engineering Investigations and Focus Study will commence, and will begin with the preliminary design of a tide gate. A Study on Flood Storage Pond for Rainwater at the Inner Harbour and a Study on Improvement of Drainage System cum Soil Investigation Services will also be launched, to explore the feasibility of improving Inner Harbour drainage using a storage pond.

Beside Inner Harbour, other smaller districts also started flood prevention and drainage projects, including Improvement Works for Outer Harbour Dikes – Compilation

of Project Plan, Flood Prevention Work along the Coast from Fai Chi Kei to Ilha Verde – Compilation of Project Plan, and Report on the Overall Plan for Flood Prevention and Drainage at the West Side of Coloane.

The work on sewers, road transport networks, cross-harbour bridges and slopes mainly comprises five parts.

1. Major studies included: Study on Flood Storage Pond for Rainwater at the Inner Harbour, and Improvement of Drainage System cum Soil Investigation Services; Construction of a Pedestrian System Surrounding Guia Hill – Compilation of Environmental Impact Assessment; Nobre de Carvalho Bridge – Preliminary Design, Engineering Investigations and Focus Study on the Construction of Two Cross-harbour Tunnels; and the Construction of a Cross-harbour Tunnel in New Urban Zone Areas A and B – Preliminary Design;
2. Project plans that were being compiled included: Seac Pai Van Reservoir neighbouring road and sewer works; road works at Vala das Borboletas, Coloane; infrastructural works of New Urban Zone Area B East; temporary pillar works at Zone F of the skywalk at Avenida Marginal do Lam Mau; Bridge Connecting New Urban Reclamation Zone A and Macao Peninsula (A2) – Compilation of Project Plan; improvement works of the footbridge at Jardim Triangular da Areia Preta; and the construction of the Pedestrian System Surrounding Guia Hill;
3. Monitoring projects included: Structural Safety Monitoring of Sai Van Bridge and Friendship Bridge; and
4. Construction works mainly included: road and drainage network works near Flor de Lotus Road in Cotai; New Urban Zone Area E2 road and drainage system construction; design and construction of sewage interceptors at rainwater outlets along the coast of Areia Preta; sewer works in the area near the Athletes Training Centre; renovation of the sewer at Praça da Assembleia Legislativa; road and pedestrian walkway improvement work at Governador Nobre de Carvalho Avenue on Taipa island; structural strengthening and maintenance of the flyover near Macau International Airport; maintenance of girders and bolster base of Friendship Bridge; slope strengthening at Governador Nobre de Carvalho Avenue on Taipa island; construction of the Skywalk at Avenida de Guimarães on Taipa; and construction of a footbridge near Macau Fisherman's Wharf on Amizade Avenue.

| Infrastructure project | Number of projects commenced | Number of projects completed |
|------------------------|------------------------------|------------------------------|
| Study | 3 | 2 |
| Design | 7 | 1 |
| Construction | 41 | 44 |

Infrastructure Development Office

The Infrastructure Development Office is responsible for facilitating and coordinating the execution, maintenance, modernisation and development of major construction projects in Macao. It also studies, follows up regarding and develops cooperative construction projects within the Greater Pearl River Delta region, which included:

- The study, coordination and implementation of the plan for constructing complementary facilities of the Macao landing point of Hong Kong–Zhuhai–Macao Bridge, including its links and other auxiliary infrastructures and facilities;
- Provision of technological and administrative support to the Macao representatives in liaison groups concerning the construction of the Hong Kong–Zhuhai–Macao Bridge;
- Planning construction projects designated by the Government within the Guangdong–Macao cooperation areas, in accordance with the needs of the MSAR;
- The study, coordination and implementation of the plan for developing various major infrastructure facilities in the MSAR; implementation of the concession of public works contract, procurement and provision of services; preparation of contracts, coordination of supervision and infrastructure testing and related works; and
- Promotion of direct or indirect participation in the study and implementation of construction works, as well as cooperation among departments and bodies responsible for procuring and providing services; promotion and follow-up work on the implementation of the plans to construct a variety of land, sea and air cross-border infrastructure as well as modernisation studies.

Development of Border Checkpoints

Taipa Ferry Terminal

To meet the demand for the development of maritime passenger transportation services, the Government modified the design of the Taipa Ferry Terminal by increasing the number of berths for ferries with a capacity of 400 passengers from eight to 16, and constructing a helicopter pad on the rooftop. The Taipa Ferry Terminal not only helps divert the saturated flow of passengers and ferries at the Outer Harbour Ferry Terminal, but also serves as a step towards a new maritime network for Macao and cities in the Pearl River Delta region.

Road Infrastructure

Coloane Ka-Ho Tunnel

The Coloane Ka-Ho Tunnel project consists of three parts: the tunnel, the exterior south section and the north linkage section. The project will connect Ka Ho and the east of Cotai, for convenient movements of residents and vehicles to and from the port without having to make a detour via Estrada da Barragem de Ka Ho, Estrada de Nossa Senhora de Ka Ho, Estrada do Alfinho de Ka Ho, or Taipa-Coloane Causeway. It can also substantially reduce commuting times and ease the long-term traffic burden.

Public Housing Projects

To alleviate the public housing demand, since 2010 the Infrastructure Development Office has commenced several public housing projects, including the public housing estates in Seac Pai Van and Taipa Lot TN27, redevelopment of public housing in Fai Chi Kei, Bairro da Ilha Verde Lot 1, 2 and 3. Construction of public housing that started in 2012 and 2013 at Northeast Road on Taipa, Rua de Choi Long, Fai Chi Kei Lots E, F, L4 and L5 has been completed.

Other projects underway included the second phase of the Mong Ha Public Housing project, Rua Central De T'oi San Public Housing Estate and Avenida de Venceslau of Morais Public Housing project. Also, work commenced on designing the public housing project on Wai Long Avenue, Taipa.

The second phase of Mong Ha Public Housing that is under construction and the sport centre that is under reconstruction occupy about 7,432 square metres. The area they occupy is mainly used for public housing, public parking, commercial and social facilities, a bus interchange station and Mong Ha sport centre. It is expected that the housing project here will provide 768 residential units, and about 700 private car and motorcycle parking spaces.

The Rua Central de T'oi San Public Housing Estate that is under construction occupies about 3,000 square metres, and mainly comprises public housing for the elderly, social facilities and public parking. The 34-storey Housing Estate will provide 510 units. The public car park will provide about 220 spaces for private cars and motorcycles.

The Avenida de Venceslau of Morais Public Housing project that is under construction occupies about 11,443 square metres. The core of the project is public housing, supplemented by a bus station, an underground public carpark and integrated government services. The project is expected to provide 1,590 residential units, as well as nearly 900 parking spaces for light vehicles and motorcycles.

New Urban Reclamation

In line with Macao's future development and to increase land supply, in 2006 the Government reported to the Central People's Government about the land reclamation plan. After the new urban reclamation plan was approved by the Central People's Government in December 2009, the Government stepped up its efforts to carry out the reclamation work. The new urban reclamation area is divided into five areas, with a total area of about 350 hectares. It is expected to provide a land reserve for Macao for the coming 20 to 30 years.

Area A is located to the east of Area Preta and Friendship Bridge on the Macao peninsula, and north of the Outer Harbour watercourse of Macao, covering an area of approximately 138 hectares. It is planned that the area will be used for commercial and residential areas, infrastructure, public/community facilities, and various industries. The public tendering process for the design of the area's public housing has been conducted.

The 33-hectare Area E1 is at the north-eastern tip of Taipa island, neighbouring Pac On Ferry Terminal, which is under construction, and the international airport. The area will be used for community facilities and transport infrastructure. In-depth planning based on existing plans and the urban development situation is now underway.

The reclaimed land in Area C totals 320,000 square metres and is located to the north of Taipa island in the sea facing Avenida dos Jardins do Oceano. It is mainly earmarked for public community facilities and a residential area. The required reclamation and dyke construction began in November 2018.

The design of the dykes in New Urban Zone Area D was completed in 2018.

Cross-border Cooperation Projects

Hong Kong-Zhuhai-Macao Bridge

Formed in July 2010 by the Hong Kong Special Administrative Region Government, the People's Government of Guangdong Province and the Macao Special Administrative Region Government, and officially launched on 27 September 2010, the Hong Kong-Zhuhai-Macao Bridge Authority is responsible for organising and implementing the construction, operation, maintenance and management work of the main bridge.

The Hong Kong-Zhuhai-Macao Bridge features a 29.6-kilometre, dual 3-lane carriageway. With a bridge-cum-tunnel structure, it includes an immersed tunnel that is about 6.7 kilometres in length, and two artificial islands. It will facilitate economic integration in the Pearl River Delta Region. Synergy of integration arising from construction of the bridge will foster industrial development in the Pearl River Delta region. Construction of the artificial island for the Zhuhai/Macao boundary crossing

facilities commenced in late 2015, and it came into service in parallel with the opening of the Hong Kong-Zhuhai-Macao Bridge on 24 October 2018.

Construction of New Guangdong-Macao Border Crossings – new checkpoint

Construction of New Guangdong-Macao Border Crossings is part of the Guangdong-Macao Cooperation Project, comprising a new checkpoint (Qingmao border control), border crossings and the Canal dos Patos improvement works.

In 2018, work began on structural engineering of the two checkpoint buildings at the Macao side and the Zhuhai side of Qingmao border control, together with the crossings. Design of the Canal dos Patos improvement project also started during the year.

Transportation Infrastructure Office

On 1 November 2007, the Government established the Transportation Infrastructure Office, aiming to foster the modernisation and improvement of transportation infrastructure as well as the construction of the Macao Light Rail Transit (LRT) System, to provide comfortable and highly efficient modern transportation for citizens and tourists.

After years of planning and preparations, the civil construction works for Macao's LRT system began in 2012. In 2018, the 9.3-km-long LRT Taipa line and installation of system facilities were basically completed. A total of 110 carriages arrived in Macao as scheduled, and system testing was conducted. Meanwhile, preparatory works for the LRT system operations were accelerated. The bill for the Law of the Light Rail Transport System was submitted to the Legislative Assembly for deliberation in the fourth quarter of the year.

As regards LRT expansion, the preliminary construction works of Barra Station were basically completed in the latter half of 2018, after which the construction of the main body of the station immediately commenced. There was good progress with preliminary construction Seac Pai Van line. Meanwhile, the study on the LRT east line also began in 2018.

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 will fully implement the Government public housing policy “Public housing as the core, supplemented by the Home Ownership Scheme”; rationally prioritise the allocation of public rental housing resources, with priority to be given to low-income families; provide technical support for strata-title buildings management; monitor the real estate agency business; and issue the related licenses 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.

Under Law No. 10/2011 - “The Home-Ownership Scheme Housing Law” amended by Law No. 11/2015, 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.

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 2018, a total of 1,606 family applicants were allocated housing units.

The process of allocating 1,544 one-bedroom Home-Ownership Scheme housing units of Ip Heng Building to those who submitted general applications began in early 2013. In 2018, 73 family applicants were allocated Home-Ownership Scheme housing units.

Public Housing

Public housing refers to units leased by the Government to low-income families and those in adverse circumstances. Methods for the allocation and management of public housing are governed by By-law No. 25/2009.

Public housing is distributed to families of weak financial standing in the form of leasing. Families of weak financial standing are defined as those whose household incomes fall beneath the legally stipulated levels.

Granting of Public Housing

The Housing Bureau launched a new round of open applications for public housing in November 2017. By the end of the application period, a total of 9,621 applications were received. The provisional waiting list and delisted names were announced on 5 December 2018, following a review of the applications. A confirmed waiting list will be announced after any statements of objection have been handled, and there will be a final selection and review process, before housing units are allocated.

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 2018, the Bureau handled 4,054 cases of Home-Ownership Scheme management-related affairs, fostered 80 management organs of Home-Ownership Scheme housing that are already in place and operating effectively, and handled 1,973 cases involving convention of owners of strata-title buildings under the Home-Ownership Scheme and affairs regarding the operations of management organs. There were 4,814 cases of 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 2018, a total of 66 licences and 184 temporary licences for commercial management of strata-title buildings had been issued. Applications for licences of strata-title building management and the related monitoring and supervision are handled by the Housing Bureau.

Seven Schemes Under 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, removing illegal structures within and establishing management organs of the common areas of private housing.

In 2018, 300 applications for the seven schemes under the Property Maintenance Fund were approved, with subsidies totalling over 24 million patacas. A total of 3,499 applications have been approved since the establishment of the fund, granting subsidies totalling 350 million patacas.

Joint Centre for Building Leakage Issues

Through cross-departmental cooperation among the Lands, Public Works and Transport Bureau, Civic and 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 2018, 1,655 cases were filed for investigations; and there was follow up work on 3,154 cases*, of which 2,034 were completed**.

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

** Total number of cases completed in 2018

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 2018, six squatter dwellings were demolished. By the year-end, 447 squatter dwellings remained, of which 192 were on the Macao peninsula and 255 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

By December 2018, the numbers of licences issued for real estate agents and brokers totalled 1,964 and 6,842, respectively; only 28 valid five-year provisional licences for real estate agents remained.

Supervision

To facilitate the implementation of laws and various tasks, during 2018 about 2,079 inspections were conducted in business premises of real estate agents, to check their compliance with the Real Estate Agency Law and initiate proceedings against alleged administrative irregularities. Complaints about real estate agents and brokers were received and handled in accordance with the relevant laws. During the year, 30 cases involving real estate agents and one case involving real estate brokers 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, 14 land grant contracts were completed and

21 lease and grant contracts were annulled in 2018. These contracts were as follows:

1. Leases and grants: A total of nine newly granted contracts involving a total area of 27,844 square metres of land; and a return of land of 58,738 square metres, involving a total floor area of 92,915 square metres;
2. Long-term leases: There were five contracts in total, no new land was granted, and 41 square metres of land was returned, involving a total floor area of 5,126 square metres;
3. Returned land: 21 contracts in total, including 17 annulled contracts, involving a return of land of 212,382 square metres.

The land granted in 2018 was mainly for residential, commercial, industrial, office, hotel, car parking, social facilities and other development uses. The premiums under land grant contracts in 2018 totalled 237,600,600 patacas. Income from land premiums during the year totalled 164,033,727 patacas, including 3,034,962 patacas from overdue payments.

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 DSSOPT’s statistics, during 2018, a total of 16 remaining professionals were accredited and registered in 13 professions, with the total number exceeding 2,500 from the law coming into force to the end of the year. The details are as follows:

| Professions | Numbers of registered professionals (2018) | Numbers of registered professionals (2015-2018) |
|---------------------------------------|--|---|
| Civil Engineering | 1 | 1,016 |
| Architecture | 1 | 407 |
| Electrical and Mechanical Engineering | 1 | 308 |

Cont.

| Professions | Numbers of registered professionals (2018) | Numbers of registered professionals (2015-2018) |
|---------------------------|--|---|
| Electrical Engineering | 4 | 309 |
| Mechanical Engineering | 3 | 275 |
| Environmental Engineering | 1 | 90 |
| Urban Planning | 4 | 58 |
| Chemical Engineering | 0 | 22 |
| Traffic Engineering | 0 | 19 |
| Fire Engineering | 0 | 18 |
| Landscape architecture | 1 | 17 |
| Industrial Engineering | 0 | 3 |
| Fuel Engineering | 0 | 2 |
| Total | 16 | 2,544 |

According to the DSSOPT's statistics, during 2018, a total of 16 remaining professionals were accredited and registered in 13 professions, with the total number exceeding 2,500 from the law coming into force to the end of the year. The details are as follows:

| Professional Discipline | Number of Interns (2018) | Number of Interns (2015-2018) |
|---------------------------------------|--------------------------|-------------------------------|
| Civil Engineering | 64 | 164 |
| Architecture | 20 | 48 |
| Electrical and Mechanical Engineering | 20 | 36 |
| Mechanical Engineering | 6 | 9 |
| Electrical Engineering | 7 | 13 |

Cont.

| Professional Discipline | Number of Interns (2018) | Number of Interns (2015-2018) |
|---------------------------|--------------------------|-------------------------------|
| Environmental Engineering | 4 | 4 |
| Fire Engineering | 1 | 1 |
| Landscape architecture | 1 | 1 |
| Total | 123 | 276 |

To start preparations for the accreditation examinations of various professional disciplines, the Council visited the Hong Kong Institute of Architect and Hong Kong Institution of Engineers in March 2018, to learn more about similar professional examination systems and the scope, type and design of examination questions of neighbouring regions. The visits also served to help understand more about the internship system and continuous learning requirements of Hong Kong.

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.

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. Pursuant to Executive Order No. 234/2018, nine members were appointed to the Committee for tenure of three years.

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 2018 | | | | | | | | | |
|--------------------------------|------------------------------|-------------------|------------------|--|--------------------------|---|---------------------------------------|-----------------------|--------------------------|
| 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 | 95,731.24 | 105,937.63 | 62,339.65 | 17,473.25 | 16,905.79 | 11,687 | 182 | 24 | 22 |
| Taipa | 27,326.67 | 58,071.55 | 376.42 | 25,836.13 | 5,049.79 | 3,570 | 76 | 1 | 21 |
| Coloane | 11,211.82 | 28,179.61 | | 15,023.67 | 624 | 1,429 | 63 | | 7 |
| Total | 134,269.73 | 192,188.79 | 62,716.07 | 58,333.05 | 22,578 | 16,686 | 321 | 25 | 50 |

The Drainage Division of the Civic and 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 2018, the Drainage Division received 28 complaints regarding street flooding caused by rainstorms, along with 272 complaints about silting of main drains. There were 30 prosecutions concerning violation of the General Regulations Governing Public Places, and 76 subpoenas were issued to alleged polluters.

Slopes

According to the Lands, Public Works and Transport Bureau, as of the end of 2018, Macao had 223 hazardous slopes on record. In 2018, 12 slopes were inspected, and the bureau conducted three slope maintenance and improvement projects.

| Number of slopes / risk | High | Medium | Low | Total |
|-------------------------|------|--------|-----|-------|
| Macao peninsula | 1 | 28 | 60 | 89 |
| Taipa island | 0 | 25 | 41 | 66 |
| Coloane island | 0 | 16 | 52 | 68 |
| Total | 1 | 69 | 153 | 223 |

The DSSOPT and the Civic and Municipal Affairs Bureau are responsible for the maintenance of roadside slopes and slopes in public parks, respectively.

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.

The Cadastre Division also provides survey information from its database to land owners 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, printed aerial survey 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 opened three Global Positioning System (GPS) reference stations – at Mount Fortress, Alto de Coloane and Taipa Grande on Taipa island in 2002, 2005 and 2008, respectively. The reference stations can receive both GPS signals as well as data from the Russian GLONASS system (Global Navigation Satellite System) 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.dsc.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 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 2018, the website had received over 1.7 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. Users can search for 50 kinds of useful information in 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. Since its launch in 2001 till the end of 2018, the online map has received more than six 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 Macao Map iOS/Android (Apps). 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.

There is also a personal computer version of *Macao Map*. Apart from viewing a map and searching for locations, users of this version can also search for the shortest route using the electronic road maps, which are free for citizens and tourists to download.

In 2014, the Cartography and Cadastre Bureau introduced the Macao Street Number Inquiry System (webmap.gis.gov.mo/AddressSearch/chn) based on the Macao Online Map, which provides a street number inquiry service with a simple operating interface.

GeoGuide for Emergency is a mobile geographical app launched by the Cartography and Cadastre Bureau with the support of the Meteorological and Geophysical Bureau (SMG). During storm surge alerts, the app provides important public information including all regions that may be affected,, emergency shelter locations and emergency telephone numbers in Macao, via mobile phones.

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.

Office for the Development of the Energy Sector

The Office for the Development of the Energy Sector (GDSE) was established on 1 January 2005 under Executive Order No. 11/2005, and is under the supervision of the Secretary for Transport and Public Works. Its purpose is to promote and coordinate all activities related to the energy sector, and thus help to implement the Government's energy policy. The office's major functions are to assist the Government in formulating policies for the energy sector; formulate development plans and related laws and regulations, and follow up on and monitor their implementation; coordinate, promote the study of and monitor the efficiency, impacts on the environment, prices and services, and technical regulations of energy products.

Electric Power

In 2018, Macao continued to strengthen regional cooperation in the electric power industry, and took the initiative to foster development of power supplies. Regarding the third circuit of the 220kV Macao-Zhuhai electric power transmission channel, installation of cables of the electricity network commenced in 2018, and is targeted for completion as soon as possible, to meet needs until 2025.

2018 saw the basic completion of the tender opening and evaluation for the initiative to generate electricity using natural gas, and it is expected that construction of the new power plant can begin in 2019. The objective is to achieve 30 percent of local electricity generation – and up to 50 percent at times of emergencies - by 2021, upon successful completion and commencement of operation of the plant, in order to ensure electricity supplies at key facilities such as hospitals, communications facilities and water supply systems, as well as most residential areas.

To perfect the local power grids, and to meet the needs of the Conde S. Januario Hospital's expansion, the newly constructed 110kV substation for Conde S. Januario Hospital will become operational in September 2019. Civil engineering works for constructing a 110kV substation in the islands Health Care Complex are already completed and station facilities are being installed, and the whole project is expected to be completed by the middle of 2019. The substation for Hong Kong-Zhuhai-Macao Bridge also came into operation in November 2018.

To support the power demand of residents in old districts, in Macao six outdoor transmission facilities were installed in several of these districts. In future, the Government will continue identifying appropriate locations in old districts for installation of outdoor

transmission facilities. The Government will also join hands with IACM to proceed with the joint construction of landfills and substations, in order to tackle the land space issue.

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, and engaged the adjacent Hengqin Thermal Power Station as complementary power source for Macao, to further raise the reliability of external power supplies.

Moreover, The Office for the Development of the Energy Sector (GDSE) worked together with the Lands, Public Works and Transport Bureau and the CEM to finish revising the technical specifications of power installations of new constructions in low-lying areas, making it mandatory for newly built buildings to have their electrical installations – including substations, main switchboards and meter boxes – installed at a level above government-specified flood-proof heights, to prevent water damage to electrical installations.

As for existing buildings, Macao people may also hire professionals to move electrical installations to higher locations, making reference to these technical specifications.

In 2018, to lower burdens on residents, the Government continued to offer the electricity fee subsidy of 200 patacas per month per household.

Natural Gas

During 2018, there was further progress with construction of the natural gas pipeline network and services. The pipeline network in Cotai was basically completed. At present, natural gas is available in the hotels at Cotai Strip, Sac Pai Van public housing cluster, commercial and residential real estate units in Cotai, Hengqin campus of the University of Macau, and for use by some buses. To complement the new urban reclamation plan and gas supply plan for Macao, the natural gas pipeline network is being extended to the Macao peninsula.

To facilitate the use of natural gas in public transportation, the Regulations for the Construction and Operation of Fuel Stations were revised in May 2018,, with added provisions regulating the renovation and operations of compressed natural gas stations and making it mandatory for gasoline stations to install vapour recovery systems.

Energy Efficiency and Conservation

Followed by the launch of Electric Vehicle Charging Facilities Safety Guidelines at the end of December 2015, the Government installed light-vehicle charging spaces in several districts in Macao in 2016, and in 2018 also made charging available at

public street parking spaces. By the end of 2018, there were 170 light-vehicle charging spaces in 35 public car parks and five roadside locations in Macao, providing a free charging service for the public.

To promote the use of energy efficient and durable LED lights, the Government plans to change all streetlights to LED lights, to save energy, improve appearance and safety. After completing the installation of LED streetlights in in Seac Pai Van and Outer Harbour Reclamation Area, the Government replaced 2,200 streetlights in various districts in 2018. At present, there are over 6,000 LED streetlights in use on roads in various districts in Macao.

The Office for the Development of the Energy Sector (GDSE) continued to organise large-scale publicity programmes, such as the Macao Energy Saving Week, the Energy Efficiency Educational Programme, and the Campus Energy Conservation Programme, in order to promote energy saving.

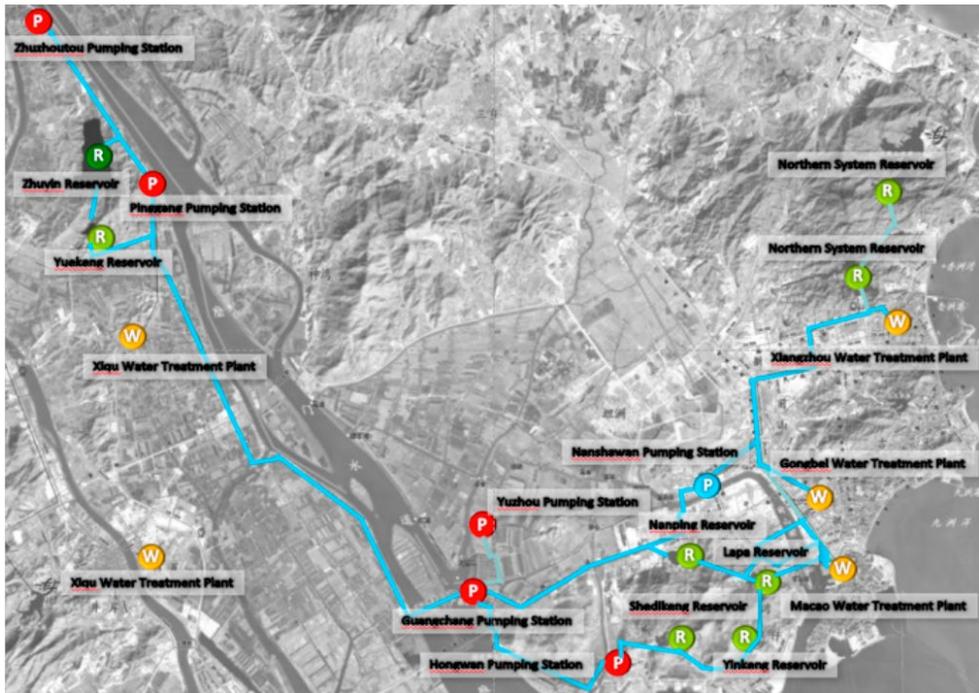
Drinking Water

Macao Water Supply Company (Macao Water)

The Macao Water Supply Company (Macao Water) was established in 1935, and is privately owned. SUEZ NWS Limited, formerly known as Sino-French Holdings (Hong Kong), which is a joint venture between the French-based Suez Lyonnaise des Eaux Group and NWS Holdings, acquired 85 percent of the company's shares in 1985, and signed a 25-year water-supply concession contract with the former Portuguese administration. 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 three major water inlets and two reserve water inlets for Macao's raw water intake. Some 95 percent or more of Macao's raw water comes from Xijiang (West River). In recent decades, to mitigate salinity effects, the raw water intakes located at Modaomen, Zhuhai, have been moved over 20 kilometres upstream.

The green labels identify reservoirs. Recently, 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.

Zhuhai currently supplies about 277,000 cubic metres of water to Macao each day. In 2018, it supplied a total of 10.121 million cubic metres of raw water. 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 390,000 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 2018, the total

length of main pipelines was 609 kilometres.

At the end of 2018, 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 1.90 million cubic metres, including 1.67 million cubic metres in the reservoir near the Outer Harbour.

A total of 10,043 million cubic metres of water were supplied in 2018, 3.3 percent more than in 2017. The daily average volume supplied in 2018 was around 275,000 cubic metres, with a maximum of 311,000 cubic metres recorded on 15 September. In 2018, the total capacity of water sales was 90.94 million cubic metres, with a daily average of 249,000 cubic metres.

Testing Water Potability

The Laboratory and Research Centre of Macao Water is responsible for water quality testing, and ensuring the quality of water supplies. The Macao Water Laboratory and Research Centre and the Civic 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 mobile site, QR codes in water bills, electronic billing, a safe email box co-established with the Macao Post and Telecommunications Bureau, Little Water Steward mobile app, official WeChat account, and refurbishment of its official website, which allows 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 facilitate closer liaison with customers, and to better understand customers' views regarding water supply services in Macao.

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 2018, Macao Water had 254,194 customer accounts, including 223,078 households, 28,778 companies and 2,338 Government institutions. According to a customer survey in 2018, more than 80 percent of customers felt satisfied with the performance of Macao Water, representing a 2.4 percent increase compared with 2017.

Supporting Sustainable Development

As a public enterprise, Macao Water has taken up the social responsibility of caring, environment protection and sustainable development. From 2011, Macao Water publishes a sustainable development report that is in line with international standards. The 2017 report was written according to the requirements of G4 Guidelines of the Global Reporting Initiative, and was awarded the "Services Institution with Verified Disclosure" logo.

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 OHSAS 18001 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 in 2018.

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 407.84 MW.

From 1906 to 1972, the electricity supply service was managed by the Macau 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 EDP Asia 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 local shareholders 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.

In 2018, CEM's capacity peaked at 971 MW on 30 May, 3.3 percent lower than the peak capacity in 2017.

The Macao electricity transmission network comprises 25 primary substations, eight high-voltage substations and 953 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 1,502 user

transformer rooms (11 kV/400 V) and 41 mid-voltage substations, and is connected by cables with a total length of 2,294 kilometres. The low-voltage transmission network comprises 906 kilometres of cable, while the street lighting network comprises 571 kilometres of cable and 11,105 streetlights.

CEM's power network is almost entirely comprised of underground cables.

Electricity Output and Consumption

CEM generated 474 GWh of electricity during 2018, a decrease of 62 percent over 2017. The amount of electricity imported from mainland China was 4,911 GWh, an increase of 24 percent over 2017, accounting for 88.8 percent of total electricity consumption; and electricity purchased from the Macao Central Incineration Centre totalled 143GWh. CEM's sales for 2018 totalled 5,319 GWh.

Customer Services

CEM established the CEM Customer Liaison Committee in 2000. With its 27 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 2018, CEM was providing services to 262,724 households. The Macao peninsula accounted for 81.15 percent of the total customer base; Taipa, 13.69 percent; Coloane, 5.10 percent; Cotai, 0.01 percent; and Hengqin, 0.05 percent.



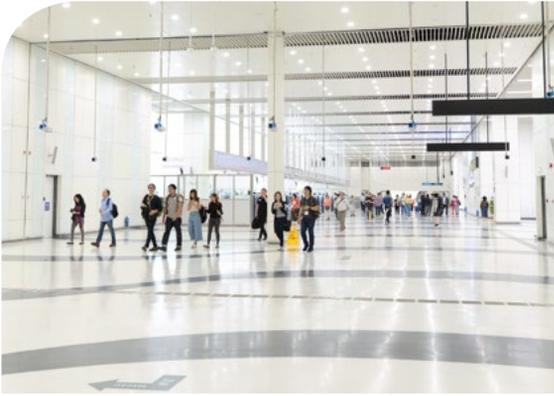
↑  珠海離境大堂 Zona de Partidas de Zhuhai
Zhuhai Departures Hall

↑  離境檢查 Imigração
Immigration

↙  自助過關通道 Passagens Automáticas
Automated Passenger Clearance System



**SMOOTH
OPERATIONS**



The Macao border checkpoint of Hong Kong-Zhuhai-Macao Bridge officially commenced operations at 9 a.m. on 24 October 2018, to provide efficient services to tourists, local residents and cross-boundary vehicles. The Government will continue improving related support systems for the convenience of local residents and travellers.

The border checkpoint adopts a “joint inspections for one-stop border crossing” operation model. Smooth operation was seen on the first day, with an average duration of 20 seconds for completing each border-crossing process. From 9 a.m. to 4 p.m., the Macao border checkpoint of Hong Kong-Zhuhai-Macao Bridge recorded a total of 8,619 border-crossing travellers.

Vehicle traffic flow was also smooth, with an average duration of 10 to 15 seconds per vehicle to complete the clearance process. By 3 p.m., the numbers of inbound and outbound vehicles were 46 and 59, respectively. The Hong Kong-Macao shuttle bus service operated 113 scheduled trips at the border checkpoint, carrying 4,742 passengers; while the intercity bus service ran about 21 scheduled trips, carrying 833 passengers.



