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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.

Urban Planning and New Urban Reclamation

The Government completed its urban development strategy in 2016, and the DSSOPT commenced the global tendering process for Macao's urban development master plan in 2017, in accordance with the principles and guidelines set out in the Macao Special Administrative Region Urban Development Strategy Study (2016-2030), with regard to the Urban Planning Law and the requirements of Macao's relevant laws and regulations.

Regarding the new urban reclamation project, clear planning objectives have been formulated based on the related development plan, together with in-depth study on the development intensity of the residential land in New Urban Zone Area A and the layout of various public facilities. The aim is to meet the requirements of providing 32,000 residential units and the planned housing capacity of 96,000 people.

To accord with the public housing policy and schedule, the project not only centres on public housing, but also involves improvements to facilities for supporting people's livelihoods. Land has been reserved for public space, infrastructure, transport facilities, and municipal and community facilities, thereby optimising the overall environment of the urban area.

During the year, the DSSOPT began drafting the urban planning conditions for areas in New Urban Zone Area A with the conditions necessary for prioritising development of public housing and facilities.

It is planned that an administration and judicial zone will be located at the New Urban Zone Area B. It will comprise seven 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. As part of the preliminary preparations for construction of the buildings, the Government is expediting and following up on progress with construction of public infrastructure in the administration and judicial zone, assessing the scale of construction work, and optimising the layout of facilities with consideration of the planned construction projects.

The Government continued with more detailed planning for New Urban Zone Area E1. Priority was given to finalising the actual locations of transport networks and public and infrastructure facilities on the Macao peninsula and in the Islands District, along with land use details, in order to optimise the seamless connectivity of sea, land and air transportation.

The Government continued following up regarding various plans for smaller areas. In the study on the Macao Eastern District Coordinated Development Plan, technical analysis and compilation of the overall coordinated development plan have been completed, based on the concept plan. There are recommendations on altering or optimising the existing or planned projects in Area Preta New Reclamation Zone, the NAPE, New Urban Zone Area A and artificial island of the Hong Kong-Zhuhai-Macao Bridge (Macao's section).

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 2017, 147 sets of planning conditions for urbanisation management were issued.

Public Works Arrangement during Typhoon Hato

Responding to the severe damage caused by Typhoon Hato in Macao, departments responsible for infrastructure cooperated with the Civil Protection Centre to handle aspects of the emergency involving landslides and fallen trees.

To ensure public safety, urban development departments sent dedicated inspection teams and operation teams for 60 inspections of and 140 operations on private buildings. They conducted a total of 338 emergency projects, 215 of which involved removal of displaced, dangerous structural elements; 50 involved removal of dangerous windows or sealing of holes on windows; 60 involved repairs of electricity supply facilities; and 13 involved miscellaneous work (including with scaffolding, and buildings' enclosing walls and external walls).

As metal canopies and signboards of several buildings in the Islands District were in danger of collapsing, the responsible public works department arranged for urgent follow-up work with the contractors, in order to remove them.

Electricity supplies to buildings in certain districts did not resume immediately after the typhoon. In the light of this, the DSSOPT worked together with the Office for the Development of the Energy Sector (GDSE) and electrical contractors commissioned by the bureau to promptly carry out multiple repair works, and follow up regarding resumption of electricity supplies.

Construction Companies and Contractors

According to DSSOPT statistics, a total of 1,307 construction contractors and companies had registered or renewed their registrations by the end of 2017. 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) | | 6 | 179 | 185 |
| Companies (urban construction) | Construction | 96 | 797 | 893 |
| | Fire | 9 | 65 | 74 |
| | Sub-total | 105 | 862 | 967 |

(Cont.)

| Category | | New registration | Renewed registration | Total |
|---|------------------|------------------|----------------------|--------------|
| Companies (urban construction and urban planning) | Construction | 22 | 91 | 113 |
| | Fire | 2 | 7 | 9 |
| | Sub-total | 24 | 98 | 122 |
| Companies (gas) | | 3 | 30 | 33 |
| | Total | 138 | 1,169 | 1,307 |

Technicians

Technicians, including engineers and architects, are categorised according to their professions and the above-mentioned law. By the end of 2017, over 1,377 technicians had registered or renewed their registrations, with details as follows:

| Category | | New registration | Renewed registration | Total |
|--|-------------------------------------|------------------|----------------------|--------------|
| Technicians (construction and urban planning) | Architects | 13 | 263 | 276 |
| | Landscape Architects | 4 | 5 | 9 |
| | Civil Engineers | 39 | 552 | 591 |
| | Fire Engineers | 2 | 7 | 9 |
| | Electrical Engineers | 14 | 105 | 119 |
| | Electrical and Mechanical Engineers | 21 | 174 | 195 |
| | Mechanical Engineers | 19 | 124 | 143 |
| | Chemical Engineers | 6 | 2 | 8 |
| | Industrial Engineers | 1 | 1 | 2 |
| | Fuel Engineers | 0 | 2 | 2 |
| | Engineering Technicians | 0 | 23 | 23 |
| | Total | 119 | 1,258 | 1,377 |

Infrastructure Projects

Private Construction Projects

According to statistics from the Lands, Public Works and Transport Bureau, in 2017, 40

building projects providing 4,318 residential flats with a total floor area of 337,658 square metres, 145 commercial units with a total floor area of 15,959 square metres, two office units with a total floor area of 3,249 square metres, six industrial/warehouse units with a total floor area of 90,282 square metres, and 3,621 parking spaces in car parks with a total area of 111,974 square metres were completed.

During 2017, construction commenced on 606 private projects providing 606 units with a total floor area of 54,045 square metres, 47 commercial units with a total floor area of 8,548 square metres, two office units with a total floor area of 328 square metres, and 433 parking spaces in car parks with a total area of 14,829 square metres. No industrial/warehouse unit construction commenced during the year.

By the end of 2017, 10,934 units were under construction, of which 10,619 were residential units with a total floor area of 1,062,429 square metres, 311 were commercial units with a total floor area of 123,527 square metres, two were office units with a total floor area of 1,194 square metres, and two were industrial units with a total floor area of 11,408 square metres; as well as 11,347 parking spaces in car parks, with a total area of 340,340 square metres.

During the year, a total of 21,765 units were still in the design phase, of which 20,529 were residential units with a total floor area of 2,820,122 square metres, 1,194 were commercial units with a total floor area of 302,502 square metres, 37 were office units with a total floor area of 27,984 square metres, and five were industrial units with a total floor area of 33,938 square metres; as well as 26,281 parking spaces in car parks, with a total area of 909,035 square metres.

In 2017, 7,332 applications were received for private construction projects, of which 1,860 applications were for demolition/maintenance/renovation, 1,553 were for simple projects in common parts of buildings, food and beverage establishment integrated construction projects, and construction licences, and 652 were for construction/expansion. During the year, 9,227 applications from 2017 and the previous year were handled, a majority of which were in the above major categories, including 2,664 applications for demolition/maintenance/renovation; 1,697 applications for simple projects in common parts of buildings, integrated construction projects for food and beverage establishments, and construction licences; and 694 applications for construction/expansion.

In 2017, 80 cases of dilapidated or dangerous buildings were filed.

Public Construction and Infrastructure Projects

To improve social facilities, the DSSOPT followed up on a number of projects in 2017. During the year, 45 projects commenced and 46 projects were completed. The projects commenced that involved open tenders included: the design and construction of the Commercial and Trade Cooperation Services Complex between China and Portuguese-speaking Countries, second-phase construction of a community services complex at Rua da Praia do Manduco, renovation of a vehicle examination centre in Cotai, construction of facilities of the Customs at Rotunda Tenente Pedro Joss da Silva Loureiro, renovation of offices of Coloane Islands Police Department on Taipa Island (Pac On), and renovation of offices on 21st and 22nd floors of Centro Golden Dragon.

Large-scale projects completed in 2017 included one that had continued from 2013, three that began in 2014, four that began in 2015, 15 that began in 2016, and 24 that began in 2017. The

more prominent ones included construction of the Court of First Instance building, first-phase construction of a community services complex at Rua da Praia do Manduco, modifications to Tap Seac Square Commercial Centre, and renovation of the warehouse outside the Macao Historical Archives.

During the year, planning commenced for three construction projects, including first-phase and second-phase construction of the Centre for Driving Lessons and Exams of Macao, construction of a temporary fire station in Ilha Verde, and maintenance of the Gate of Understanding. Tenders for these projects will be initiated in an orderly manner.

With regard to infrastructure, the Government continued to follow up regarding a study of the plan for flood prevention and drainage in the Macao peninsula and the Islands District, road networks, sewer improvement works, cross-harbour bridges and slope monitoring and maintenance, with three studies completed, five studies commencing, design work for one project completed, design work for six projects commencing, 60 projects completed, and 63 projects commencing. Open tenders were invited for five large-scale projects.

To solve the problem of flood prevention and drainage in Macao in the long term, in 2016 and 2017 the DSSOPT completed three studies: the Feasibility Study on Sluices at Inner Harbour of Macao, Masterplan for Flood Prevention and Drainage at the Promenade of Inner Harbour of Macao, and Improvement of the Drainage System of the Macao Peninsula.

The Government will gradually initiate follow-up work, including the Feasibility Study on Sluices at the Inner Harbour of Macao: Engineering Investigations and Focus Study, and Study on Flood Storage Pond for Rainwater at the Inner Harbour, and Improvement of Drainage System cum Soil Investigation Services.

Apart from the Inner Harbour, the Government also commenced flood control work for other districts. These flood control measures included 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: Improvement of the Drainage System of the Macao Peninsula; Construction of a Pedestrian System Surrounding Guia Hill - Compilation of Environmental Impact Assessment; Nobre de Carvalho Bridge – Feasibility Study on Construction of Two Cross-harbour Tunnels; and Construction of a Cross-harbour Tunnel in New Urban Zone Areas A and B – Preliminary Design.
2. Project plans that were being compiled included: Footbridge Near Macau Fisherman’s Wharf on Amizade Avenue; Skywalk at Avenida de Guimaraes on Taipa; and Bridge Connecting New Urban Reclamation Zone A and Macao Peninsula (A2) – Compilation of Project Plan.
3. Monitoring projects included: Sai Van Bridge Structural Safety Monitoring and Installation of Equipment for Structural Safety Monitoring System at Friendship Bridge.

4. Construction works mainly included: rainwater interception in Taipa Grande on Taipa island; sewage pump station at Avenida Marginal do Patane; renovation of sewer at Avenida de Kwong Tung; road and drainage network works near Flor de Lotus Road in Cotai; New Urban Zone Area E1 temporary road works; New Urban Zone Area E2 road and drainage system construction work; improvement of sewage flow interceptors in the NAPE; design and construction project for sewage interceptors at rainwater outlets along the coast of Areia Preta; sewer works in the area near the Athletes Training Centre; renovation of sewer at Praca da Assembleia Legislativa; road works in the area around the Mong Ha Public Housing; roadworks at the South and North Bay of Fai Chi Kei; construction of Avenida Doutor Mario Soares walkway; improvement of electrical and mechanical facilities at the footbridge on Rua de Ferreira do Amaral; elevator installation at the footbridge near Nam Fong Building on Amizade Avenue; and road and pedestrian walk improvement work at Governador Nobre de Carvalho Avenue on Taipa island.

| Infrastructure project | Number of projects commenced | Number of projects completed |
|------------------------|------------------------------|------------------------------|
| Study | 5 | 3 |
| Design | 6 | 1 |
| Construction | 63 | 60 |

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.

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 Altinho 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.

The second phase of the Mong Ha Public Housing project and Rua Central De T'oi San Public Housing Estate resumed construction in 2017. The feasibility study on the public housing project on Avenue Wai Long, Taipa and the compilation of plans for the public housing project on Avenida de Venceslau of Morais also commenced in 2017.

| Projects | No. of residential units | Other facilities |
|--|--------------------------|--|
| Bairro da Ilha Verde Public Housing Estate, Lots 1, 2 | 2,356 | Public car park with 1,442 light vehicle and 1,634 motorcycle parking spaces, public transport interchange, commercial and social facilities |
| Bairro da Ilha Verde Public Housing Estate, Lot 3 | 770 | Public car park with about 283 light vehicle and 286 motorcycle parking spaces |
| Northeast Road, Taipa Public Housing Estate | 694 | 292 light vehicle and 315 motorcycle parking spaces, social facilities, recreation deck for residents |
| Fai Chi Kei Public Housing Estate, Lots E, F | 436 | Podium garden and social facilities located on the ground floor to 4th floor, public car park with 121 light vehicle and 107 motorcycle parking spaces |
| Rua de Choi Long Taipa Public Housing Estate | 288 | Commercial facilities, public car park with 59 light vehicle parking spaces and 132 motorcycle parking spaces |
| Baía do Norte, Fai Chi Kei Public Housing Estate Lots L4, L5 | 378 | Public car park with 80 light vehicle and 83 motorcycle parking spaces |
| Second phase of the Mong Ha Public Housing project | 768 | Public car park with 700 light vehicle and motorcycle parking spaces |
| Rua Central De T'oi San Public Housing Estate | 510 | Public car park with 220 light vehicle and motorcycle parking spaces |

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 the biggest of the five sub-divisions, covering an area of approximately 138 hectares. It is located to the east of Areia Preta and Friendship Bridge on the Macao peninsula and north of the Outer Harbour watercourse of Macao. The reclamation work was basically completed by the end of 2017. It is planned that the area will be used for commercial and residential areas, infrastructure, public/community facilities, and various industries.

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 construction work was completed in September 2017. The area will be used for community facilities and transport infrastructure.

The design for the reclamation for New Urban Zone Area C was completed in 2017.

The design of the dykes in New Urban Zone Area D was commenced in 2017.

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 will feature a 29.6-kilometre, dual 3-lane carriageway. With a bridge-cum-tunnel structure, it will include 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; this island will be put into operation in tandem with the commissioning of the Hong Kong-Zhuhai-Macao Bridge. With the approval of the State Council, the Macao border crossing area of Hong Kong-Zhuhai-Macao Bridge was inaugurated at midnight on 15 March 2018 for use by the Macao SAR, and shall operate under the jurisdiction of Macao.

Construction of New Guangdong-Macao Border Crossings

Under the Framework Agreement on Cooperation between Guangdong and Macao, to further

promote regional cooperation, the new Guangdong-Macao border checkpoint will be used as an independent checkpoint, diverting passenger flows from the Border Gate. It is a closed-system checkpoint for passenger crossings only. According to the preliminary design, the number of boundary-crossing passengers will be around 200,000 to 250,000.

The new border crossing project is designed to include public transport facilities, ancillary facilities for commercial conferences and exhibitions, multi-storey car parks and office floors. Construction of the new wholesale market was completed in the second quarter of 2017. Merchants moved in and commenced business operations in late 2017, immediately after which work began on demolishing the old wholesale market.

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 2017, installation of the train system facilities for the 9.3-kilometre LRT Taipa line commenced, and the construction of the LRT depot superstructure was also in full swing.

In the fourth quarter of 2017, refinement and trial operation of the train commenced, immediately after the first batch of four train carriages and two dedicated repair vehicles was delivered to Macao. Preparations for operations also commenced; these included establishing a franchised company for the operation of the LRT, and conducting a public consultation for the law on the LRT system, to help meet the target of commencing operation of the Taipa line in 2019.

The preliminary construction works of Barra Station commenced in the fourth quarter of 2017, in preparation for extending the LRT service to the Macao peninsula. The design and preliminary preparations for Seac Pai Van line have also commenced.

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.

Eligibility for Home-Ownership Scheme Housing

Residents wishing to purchase Home-Ownership Scheme Housing need to file applications with the Housing Bureau. Representatives of households and individual applicants must be at least 18 years old, and must be Macao permanent residents. In addition to compliance with the upper limit of monthly income and total net assets stipulated by the relevant Executive Order, applicants should not be owners or appointed buyers of any residential properties, independent units or land, or lessees of any private land in the five years prior to submission of applications.

Moreover, the following persons are not eligible for applying for Home-Ownership Scheme Housing: a member of another household which has purchased a Home-Ownership Scheme housing unit; a household or individual involved in a case in which the pre-sale contract of the Home-Ownership Scheme housing unit has been declared void or annulled within two years prior to the application; a household or individual whose application has been rejected due to false declarations or fraud within two years prior to the application; an individual whose name is in a household which is permitted by the Housing Bureau to purchase a Home-Ownership Scheme housing unit or has signed a pre-sale contract for a Home-Ownership Scheme housing unit; an individual whose name is in a household which is eligible for Home Acquisition or Renting Loan Subsidy; an applicant, appointed buyer, or spouse of owner of a Home-Ownership Scheme housing unit, appointed buyer and its household member who has been issued with an occupying permit for a Home-Ownership Scheme housing unit but gave up the purchase within five years prior to the application; and individual and his or her family member who have sold a Home-Ownership Scheme housing unit. An individual should not submit more than one application, including as a household member.

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. In 2017, 352 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 in early 2013 is still in progress. In 2017, 22 applicants 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.

Requirements for Applications for Public Housing

Applications for public housing will open at a time deemed appropriate by the Housing Bureau. Households applying to lease public housing should fulfil the following requirements: the applicant should be aged at least 18, have resided in Macao for at least seven years, and be a holder of a Macao permanent resident identity card. The applicant and the members of the household should not be the owner or the appointed buyer of any buildings or independent units during the three years before the application, the owner or lessee of any private land, the member of another household which have purchased Home-Ownership Scheme housing, the member of another family that was granted housing through the regulations of the Home Acquisition or Renting Loan Subsidy Scheme and the Home Purchase Loan Subsidy Scheme, or the member of a family that has been punished for violating public housing regulations. In addition, the total monthly income and the total net assets of the household should not exceed the limit stipulated by law.

The Upper Limit of Monthly Household Income and Total Net Assets

Under Executive Order No. 179/2012, which was amended in accordance with Executive Order No. 368/2017, the monthly household income and the total net assets of households applying for renting public housing should not exceed the amounts in the following table:

Monthly Household Income and Total Net Assets

| Household size (No. of family members) | Monthly household income (in Patacas) | Net assets (in Patacas) |
|--|---------------------------------------|-------------------------|
| 1 | 11,470 | 247,800 |
| 2 | 17,360 | 375,000 |
| 3 | 23,430 | 506,100 |
| 4 | 25,680 | 554,700 |

(Cont.)

| Household size (No. of family members) | Monthly household income (in Patacas) | Net assets (in Patacas) |
|--|---------------------------------------|-------------------------|
| 5 | 27,310 | 589,900 |
| 6 | 32,000 | 691,200 |
| 7 or above | 33,630 | 726,500 |

Granting of Public Housing

In 2017, the Housing Bureau continued to examine public housing applications submitted in 2013 by families who were on the waiting list, and proceeded with making allocations for them. All applications from families on the waiting list were processed in August 2017.

Temporary Subsidies for Families on the Waiting List for Public Housing

In the wake of economic inflation, in September 2016 the Government renewed the Subsidy Scheme for Families Awaiting Public Housing. A family awaiting public housing with a total monthly income not exceeding the statutory cap is eligible for one of the following: a monthly subsidy of 1,650 patacas for a family of one or two people; or a monthly subsidy of 2,500 patacas for a family of three or more people. From 2008 to 2017, 9,421 applications for the housing subsidies were approved, with the subsidies totalling about 400 million patacas. By 31 August 2017, the Government completed all necessary follow-up action for families on the public housing waiting list. The entire waiting list was therefore cleared, and temporary housing subsidies were also disbursed during the same period.

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 committees and convening the first meetings, and provides assistance in resolving disputes about building administration and management of Home-Ownership Scheme housing. During 2017, the Housing Bureau processed 4,126 cases involving building management of Home-Ownership Scheme housing; facilitated the establishment of 77 management committees; and processed 3,512 cases related to the convocation of the General Assembly of the owners and management committees.

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.

A total of 4,818 cases involving technical support provided to the management of common parts of strata-title buildings were recorded in 2017.

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 repairing and maintaining private housing, setting up management committees and removing illegal structures, by offering them subsidies or interest-free loans.

In 2017, there were 2,305 enquiries concerning the seven schemes under the Property Maintenance Fund; 312 applications were approved, for subsidies totalling over 28 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, along with technical evaluations carried out by the Civil Engineering Laboratory, the Government established the Joint Centre for Building Leakage Issues on 1 February 2009. Led by the Housing Bureau, the centre provides a one-stop platform for offering assistance to residents. In 2017, 1,785 cases were filed for investigations; and there had been follow up work on 4,470 cases*, of which 2,971 were completed**.

A total of 16,584 cases had been received as of 31 December 2017, of which 15,085 cases were completed, representing a completion rate of 90.96 percent.

* Total outstanding cases refer to the total number of new and old cases pending processing between 2009 and 2017

** Total number of cases completed in 2017

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 2017, 17 squatter dwellings were demolished. By the year-end, 453 squatter dwellings remained, of which 193 were on the Macao peninsula and 260 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 be licensed 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 2017, the numbers of licences issued for real estate agents and brokers totalled

1,797 and 5,987, respectively; only 29 valid five-year provisional licences for real estate agents remained.

Supervision

To facilitate the implementation of laws and various tasks, during 2017 about 2,800 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, 17 cases involving real estate agents and four cases involving real estate brokers resulted in penalties for breaching 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, 17 land grant contracts were completed and 14 lease and grant contracts were annulled in 2017. These contracts were as follows:

1. Leases and grants: A total of four newly granted contracts involving a total area of 504 square metres of land; and a return of land of 1,143 square metres, involving a total floor area of 5,013 square metres;
2. Long-term leases: There were 13 contracts in total, no new land was granted, and 54 square metres of land was returned, involving a total floor area of 940 square metres;
3. Annulments of leases and grants: 14 contracts in total, involving a resumption of land with a total area of 59,500 square metres.

The land granted during the year was mainly for residential, car park, commercial, hotels, social facilities, offices and other development uses. No land was granted for industrial purposes. The land premiums totalled 96,255,807 patacas. Income from land premiums during the year totalled 1,099,725,013 patacas, including 915,216 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 bachelor’s, master’s and doctoral degrees in the areas of 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 2017, a total of 485 professionals were accredited and registered in 13 professions, with the total number exceeding 2,500 by the end of the year since the law came into force. The details are as follows:

| Professions | Numbers of registered professionals (2017) | Numbers of registered professionals (2015-2017) |
|---------------------------------------|--|---|
| Civil Engineering | 146 | 1,015 |
| Architecture | 37 | 404 |
| Electrical and Mechanical Engineering | 48 | 307 |
| Electrical Engineering | 97 | 305 |
| Mechanical Engineering | 78 | 272 |
| Environmental Engineering | 42 | 89 |
| Urban Planning | 13 | 57 |
| Chemical Engineering | 11 | 22 |
| Traffic Engineering | 6 | 19 |
| Fire Engineering | 4 | 18 |
| Landscape architecture | 2 | 16 |
| Industrial Engineering | 0 | 3 |
| Fuel Engineering | 1 | 2 |
| Total | 485 | 2,529 |

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.

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 2017 | | | | | | | | | |
|--------------------------------|------------------------------|-------------------|------------------|--|--------------------------|---|---------------------------------------|-----------------------|--------------------------|
| 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) | | | | | |
| Zone | | | | | | | | | |
| Macao | 95,152.74 | 105,322.43 | 62,339.65 | 17,473.25 | 15,982 | 11,639 | 179 | 24 | 22 |
| Taipa | 27,208.19 | 56,710.40 | 376.42 | 25,836.13 | 4,806 | 3,503 | 76 | 1 | 21 |
| Coloane | 10,965.80 | 28,179.61 | | 15,023.67 | 624 | 1,407 | 63 | | 7 |
| Total | 133,326.73 | 190,212.44 | 62,716.07 | 58,333.05 | 21,412 | 16,549 | 318 | 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 2017, the Drainage Division received 26 complaints regarding street flooding caused by rainstorms, along with 206 complaints about silting of main drains. There were 61 prosecutions concerning violation of the General Regulations Governing Public Places, and 118 subpoenas were issued to alleged polluters.

Slopes

According to the Lands, Public Works and Transport Bureau, as of the end of 2017, Macao had 221 hazardous slopes on record.

| Number of slopes / risk | High | Medium | Low | Total |
|-------------------------|------|--------|-----|-------|
| Macao peninsula | 21 | 25 | 60 | 87 |
| Taipa island | 1 | 21 | 44 | 66 |

(Cont.)

| Number of slopes / risk | High | Medium | Low | Total |
|-------------------------|------|--------|-----|-------|
| Coloane island | 0 | 16 | 52 | 68 |
| Total | 3 | 62 | 156 | 221 |

In 2017, 18 slopes underwent regular inspection.

The Lands, Public Works and Transport Bureau and the Civic and Municipal Affairs Bureau are responsible for maintaining roadside slopes and slopes in public parks, respectively. During the year, the Lands, Public Works and Transport Bureau carried out three slope upgrading projects.

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 2017, the website had received over 910,000 visitors since its launch in 2008.

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 all buildings, streets, government departments, tourist spots and banks in Macao.

To accord with the Government's policy to create an accessible environment, nine maps for walking routes were incorporated into the Macao Online Map in 2017, providing information on recommended walking routes and time required. Since its launch in 2001 till the end of 2017, the online map has received more than five 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, providing on-the-go geographic information required by users.

An updated version of the Macao Map was published in 2017, providing additional geographic information such as aerial photographs and directions of road traffic flows. The public bus routes and stations inquiry function has also been optimised, by adding a point-to-point search function for public bus routes, with multiple route option.

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.

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.dsps.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 2017, 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, construction and installation of cables of the electricity network will commence in 2018 after confirmation of construction routes and the work plan. It is expected that after the power transmission channel becomes operational in 2019, the electricity transmission capacity will meet needs until 2025.

To perfect the local power grids, and to meet the needs of the Conde S. Januario Hospital's expansion, construction of the 110kV substation for Conde S. Januario Hospital was completed in December. Civil engineering works for constructing a 110kV substation in the islands Health Care Complex have begun, and are expected to be completed in late 2018. The substation for Hong Kong–Zhuhai–Macao Bridge is expected to be completed in mid-2018.

To support the power demand of residents in old districts, five outdoor transmission facilities were installed in various old districts in Macao. In future, the Government will continue identifying appropriate locations in old districts for installation of outdoor transmission facilities, and will consider installing substations on refuse tips, to make the best use of land space.

After Typhoon Hato, the Government reviewed the electricity supply in Macao by working with mainland China on a plan for a secured emergency electricity supply for Macao, as well as expanding the capacity of the local electricity supply.

The Office for the Development of the Energy Sector (GDSE) worked together with the Lands, Public Works and Transport Bureau and the CEM to reformulate the Reformation Plan for Electricity Transmission Networks in Low-lying Areas; and to formulate the Design Standard for Substations in New Buildings, which regulates the design and installation location of substations in new buildings, to enhance the waterproofing of consumer electrical installations in buildings in low-lying areas.

In 2017, to lower burdens on residents, the Government continued to offer the electricity fee subsidy of 200 patacas per month per household.

Natural Gas

During 2017, construction of the natural gas pipeline network and services progressed on schedule. The establishment of the pipeline network in Cotai was basically completed. At present, natural gas is available in the hotel at Cotai Strip, Sac Pai Van public housing cluster, 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 support the application and development of natural gas in Macao, the Technical Regulations for a Low Pressure Gas Distribution Network were formulated in April 2017 to enhance safety of the low pressure gas distribution network, and ensure the regulations can complement the other gas network technical regulations and hence maintain consistency.

Energy Efficiency and Conservation

Followed by the launch of Electric Vehicle Charging Facilities Safety Guidelines at the end of December 2015, the Government installed 60 light-vehicle charging spaces in different districts in Macao in 2016, and in 2017 continued with installing 50 electric vehicle charging spaces. By the end of 2017, there were 121 electric vehicle charging spaces in 26 public car parks 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 Seac Pai Van and Outer Harbour Reclamation Area, the Government replaced 1,300 streetlights in various districts in 2017. At present, there are about 1,800 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.

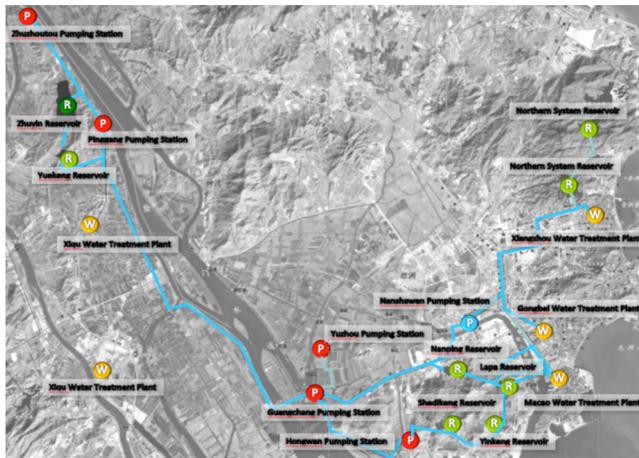
Drinking Water

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. Today, the major shareholders of SUEZ NWS Limited are the French-based Suez Lyonnaise des Eaux Group, a new company formed after the merger of the French Lyonnaise des Eaux Group and Suez Group in 1997, and NWS Holdings, a subsidiary of New World Development in Hong Kong.

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 of Macao's raw water comes from the Modaomen estuary of the Xijiang (West River) in adjacent Zhuhai. In recent decades, to mitigate salinity effects, the raw water intakes for Zhuhai and Macao have been moved upstream.

The green labels identify reservoirs. Recently, to mitigate salinity effects, the Zhuyin Reservoir was built in Pinggang and trial operation began in autumn 2011.

Zhuhai currently supplies about 268,000 cubic metres of water to Macao each day. In 2017, it supplied a total of 97.67 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 2017, the total length of pipelines was 575 kilometres.

At the end of 2017, the total volume of raw water stored in Macao's reservoirs (including the Main Storage Reservoir - the Outer Harbour Reservoir, the Seac Pai Van Reservoir, the Ka-Ho Reservoir and the Hac Sa Reservoir) was 2.98 million cubic metres, including 1.9 million cubic metres in the reservoir near the Outer Harbour.

A total of 97.23 million cubic metres of water were supplied in 2017, 0.22 percent more than in 2016. The daily average volume supplied in 2017 was around 266,000 cubic metres, with a maximum of 299,000 cubic metres recorded on 11 August. In 2017, the total capacity of water sales was 88.44 million cubic metres, with a daily average of 242,000 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.

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 a mobile site, QR codes in water bills, electronic billing, a safe email box co-established with Macao Post, 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 and individuals who receive the Social Welfare Bureau's single-parent or medical subsidies or subsidies for the disabled.

As at the end of 2017, Macao Water had 248,473 customer accounts, including 217,853 households, 28,322 companies and 2,298 Government institutions. According to a customer survey in 2017, more than 80 percent of customers felt satisfied with the performance of Macao Water, representing a 0.4 percent increase compared with 2016.

Supporting Sustainable Development

As a public enterprise, Macao Water has taken up the social responsibility of environmental protection and sustainable development. From 2011, Macao Water publishes a sustainable development report that is in line with international standards. The 2016 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, and an ISO 50001 Energy 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 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 were 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: the Sino-French Group which holds 42 percent, followed by 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 2017, CEM's capacity peaked at 1,004 MW on 22 August, 7.7 percent higher than the peak capacity in 2016.

The Macao electricity transmission network comprises 23 primary substations, seven high-voltage substations and 299 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 two 110 kV cables were connected to Gongbei Substation and Nanping Substation, while the two 220 kV cables were connected to Zhuhai Substation and Qinyun Substation.

The 11 kV medium-voltage electricity transmission network comprises 1,480 user transformer rooms (11 kV/400 V) and 40 mid-voltage substations, and connected by cables with a total length of 718 kilometres. The low-voltage transmission network comprises 854 kilometres of cable, while the street lighting network comprises 529 kilometres of cable and 14,900 streetlights. CEM's power network is almost entirely comprised of underground cables.

Electricity Output and Consumption

CEM generated 1,260 GWh of electricity during 2017, an increase of 60 percent over 2016. The amount of electricity imported from mainland China was 3,952 GWh, a decrease of 8.2 percent over 2016, accounting for 73.5 percent of total electricity consumption; and electricity purchased from the Macao Central Incineration Centre totalled 166GWh. CEM's sales for 2017 totalled 5,170 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 2017, CEM was providing services to 255,901 households. The Macao peninsula accounted for 81.12 percent of the total customer base; Taipa, 13.82 percent; Coloane, 5.01 percent; Cotai, 0.01 percent; and Hengqin, 0.05 percent.



VIEWING FACILITIES ON TAIPA



Over time, the Government has improved the pedestrian system on Taipa, to construct an environment with barrier-free access through flexibly combining various facilities. The construction of viewing facilities on Taipa started in August 2014, and was completed in September 2016.

The project involved rebuilding a 180-degree viewing platform and installing a pedestrian crossing, while the Tou Tei Temple was preserved. Visitors can take an observation elevator and walk across a unique dragon-shaped bridge to the 180-degree viewing platform on Taipa Pequena, which affords views of the Shizimen Waterway and the southern tip of the Macao peninsula.

