

`PWP Item 4215DS
Yuen Long and Kam Tin Sewerage and Sewage Disposal Stage 2

Project Profile

1. Basic Information

1.1 Project title

The project with title “ Yuen Long and Kam Tin Sewerage and Sewage Disposal Stage 2 ” consists of the following packages:

- (a) Package 2A-1T – Yuen Long STW Effluent Pipeline
- (b) Package 2A-2T – Ngau Tam Mei / San Tin Trunk Sewerage Phase 1
- (c) Package 2B-1T – Ngau Tam Mei / San Tin Trunk Sewerage Phase 2
- (d) Package 2A-3T – Lau Fau Shan/Mong Tseng Trunk Sewerage
- (e) Package 2B-2T – Yuen Long South Branch Sewers

Drawing no. DDN/215DS/0810 showing the above packages is attached.

1.2 Purpose and nature of the project

This project is part of the “Yuen Long and Kam Tin Sewerage and Sewage Disposal” (YLKTSSD) scheme recommended by the “Review of Yuen Long and Kam Tin Sewerage and Sewage Treatment Requirements” completed in January 1999 by the Environmental Protection Department (EPD). The YLKTSSD scheme is aimed at phased implementation of sewerage extension in the Northwest New Territories to cope with existing and planned developments.

(a) Works package 2A-1T - Yuen Long STW Effluent Pipeline

The purposes of this works package is to provide a pumping system conveying treated effluent from Yuen Long Sewage Treatment Works (YLSTW) to San Wai Sewage Treatment Works (SWSTW) for disinfection before being discharged into Urmston Road. EPD’s aforementioned Review recommended to construct a pumping system consisting of a pumping station in the north of YLSTW for collection and conveyance of treated effluent from YLSTW through rising mains to SWSTW.

(b) Works package 2A-2T – Ngau Tam Mei / San Tin Trunk Sewerage Phase 1 & 2B-1T - Ngau Tam Mei / San Tin Trunk Sewerage Phase 2

The purpose of these works packages is to provide the trunk sewerage consisting of gravity sewers, rising mains and pumping stations to Ngau Tam Mei / San Tin for the collection and conveyance of sewage generated from Fairview Park and nearby barracks and low rise developments.

(c) Works package 2A-3T – Lau Fau Shan / Mong Tseng Trunk Sewerage & 2B-2T – Yuen Long South Branch Sewers

The purpose of these works packages is to provide trunk sewerage in Lau Fau Shan/Mong Tseng and Yuen Long South areas for collection and conveyance of

sewage generated from the areas to the San Wai Sewage Treatment Works for treatment and disposal.

The proposed works are more particularly described in Section 1.4 below. It is noted that the details of the proposed works, such as sewer alignments and the number and the capacity of pumping stations required, are subject to modifications at the design stage.

1.3 *Name of project proponent*

Project Management Division, Drainage Services Department

1.4 *Location and scale of project and history of site*

1.4.1 *Package 2A-1T – Yuen Long STW Effluent Pipeline*

(a) *YLKTSSD scheme*

The layout of the proposed works under the YLKTSSD scheme is shown on drawing no. DDN/215DS/4819A appended herewith. The proposed twin rising mains are of diameter 1400mm. The capacity of the pumping station, in terms of peak flow, is 280,000 m³/day.

The proposed works are divided into the following six works items and annotated accordingly on drawing no. DDN/215DS/4819A.

<i>Works Item</i>	<i>Details</i>
OP1	Pumping station in the north of YLSTW
OS1	Twin rising mains from item OP1 to Tin Tsz Road in Tin Shui Wai
OS2	Twin rising mains from Tin Tsz Road via Tin Wah Road to Tin Ying Road in Tin Shui Wai
OS3	Twin rising mains along Tin Ying Road in Tin Shui Wai
OS4	Twin rising mains from Tin Ying Road to Ping Ha Road
OS5	Twin rising mains from Ping Ha Road via Tin Ha Road to SWSTW

(b) *Alternative scheme*

Having considered the comments received from relevant departments/utility companies through the recent general layout circulation of the project, another alternative route for the proposed twin rising mains is identified so as i) to avoid encroaching upon the nearby permitted burial ground, village boundary, fish ponds, wetland and the development of Fung Lok Wai; ii) to minimize the number of private lots to be resumed; and iii) not to affect the stabilities of slopes at Tin Ying Road.

In order to select the most feasible sewerage scheme from environmental point of view between these two schemes, the alternative scheme is incorporated into this project profile for assessment.

The layout of the proposed works under the alternative scheme is shown on drawing no. DDN/215DS/4820A appended herewith. The proposed twin rising mains are of diameter 1400mm. The capacity of the pumping station, in terms of peak flow, is 280,000 m³/day.

The proposed works under the alternative scheme are divided into the following seven works items and annotated accordingly on drawing no. DDN/215DS/4820A.

<i>Works Item</i>	<i>Details</i>
AP1	Pumping station in the north of YLSTW
AS1	Twin rising mains in the northwestern side of YLSTW
AS2	Twin rising mains from item AS1 to Fuk Shun Street
AS3	Twin rising mains from Fuk Shun Street to Tin Wah Road in Tin Shui Wai
AS4	Twin rising mains between Tin Wah Road and Tin Ying Road in Tin Shui Wai
AS5	Twin rising mains from item AS4 to Ping Ha Road
AS6	Twin rising mains from Ping Ha Road to SWSTW

1.4.2 Package 2A-2T – Ngau Tam Mei / San Tin Trunk Sewerage Phase 1 & Package 2B-1T – Ngau Tam Mei / San Tin Trunk Sewerage Phase 2

The proposed works under these works packages are shown on the layout plan numbered DDN/215DS/7801C appended herewith. The proposed sewers and rising mains range from 150mm to around 900mm in diameter. The capacity of the five pumping stations, in terms of average dry weather flow, is of the following orders:

P1	Ngau Tam Mei sewage pumping station	13000 m ³ /day
P2	Tam Mei Barracks sewage pumping station	100 m ³ /day
P3	San Tin sewage pumping station	1200 m ³ /day
P4	San Lung Tsuen sewage pumping station	1000 m ³ /day
P5	San Tin Barracks sewage pumping station	200 m ³ /day

These two packages are divided into the following 12 works items as shown on the drawing DDN/215DS/7801C and annotated accordingly as follows:

<i>Works Item</i>	<i>Details</i>
P1	Ngau Tam Mei sewage pumping station
S1	Sewers along Ngau Tam Mei Main Drainage Channel Phase 1 from P1 to Nam San Wai sewage pumping station
S2	Branch sewers from Fairview Park to S4 along Ngau Tam Mei Main Drainage Channel Phase 1 opposite to S1
P2	Tam Mei Barracks sewage pumping station
S3	Branch sewers from P2 to P1 along Main Drainage Channel for Ngau Tam Mei Phase 2
S4	Sewers from P3 to P1 along Castle Peak Road-San Tin near Yau Mei San Tsuen, Mai Po San Tsuen and Mai Po Lo Wai
P3	San Tin sewage pumping station
S5	Sewer upstream of P3 near Tsing Lung Tsuen
P4	San Lung Tsuen sewage pumping station

S6	Branch sewers from P4 to S5 along the village tracks in Fan Tin Tsuen
P5	San Tin Barracks sewage pumping station
S7	Sewer from P5 to S5

1.4.3 Package 2A-3T – Lau Fau Shan/Mong Tseng Trunk Sewerage & 2B-2T – Yuen Long South Branch Sewers

The proposed works for the Lau Fau Shan/Mong Tseng and the Yuen Long South are shown on the attached Drawing No. DDN/215DS/6807 and DDN/215DS/8808A respectively. The sizes of the proposed sewers and rising mains are in the range of 150mm to 300mm in diameter. The capacity of the nine pumping stations, in term of average dry weather flow, is of the following orders:

Name of Sewage Pumping Station	Average Dry Weather Flow (m ³ /day)
Lau Fau Shan	200
Mong Tseng Tsuen	100
Shan Ha Tsuen	400
Muk Kiu Tau Tsuen	900
Sham Chung Tsuen	1000
Shui Tsiu San Tsuen	1000
Shung Ching San Tsuen	1200
Nga Yiu Tau	500
Pak Sha Tsuen	500

These two packages are divided into the following 22 works items and annotated accordingly as follows:

<i>Works Item</i>	<i>Details</i>
A1	Lau Fau Shan sewage pumping station
G1	Sewers from A1 to Tin Shui Wai Reserved Zone pumping station (TSWRZPS)
A2	Mong Tseng sewage pumping station
G2	Sewers along Lau Fau Shan Road from A2 to TSWRZPS
B1	Shan Ha Tsuen sewage pumping station
H1	Sewers from B1 to the connection sewer at Yuen Long Highway
B2	Muk Kiu Tau Tsuen sewage pumping station
H2	Sewers along Kung Um Road from B2 to the connection sewer at Yuen Long Highway
B3	Sham Chung Tsuen sewage pumping station
H3	Sewers from B3 to the connection sewer at Yuen Long Highway
B4	Shui Tsiu San Tsuen sewage pumping station
H4	Sewers from B4 to B3
H5	Sewers from Tai Tong Tsuen to B4
B5	Shung Ching San Tsuen sewage pumping station
H6	Sewers along Tai Tong Road from Hung Tso Tin Tsuen to B5
H7	Sewers from B5 to the connection sewer at Yuen Long Highway
B6	Nga Yiu Tau sewage pumping station
H8	Sewers along Tai Shu Ha Road East from Tong Tau Po Tsuen to B6
H9	Sewers along Tai Shu Ha Road East from B6 to the connection sewer at Yuen Long Highway
B7	Pak Sha Tsuen sewage pumping station
H10	Sewers along Kung Um Road from Wong Nai Tun Tsuen to B7

1.5 *Number and type of designated project*

1.5.1 *Package 2A-1T – Yuen Long STW Effluent Pipeline*

(a) YLKTSSD scheme

On the basis of the latest Outline Zoning Plans No. S/YL-LFS/4, S/TSW/4 and S/YL-HT/4 prepared by Planning Department, two of the works items are Designated Projects within the definition of Schedule 2 of the EIA Ordinance. Both items **OP1** and **OS1** are of type Q.1. The other items, **OS2** to **OS5**, are non-Designated Projects.

(b) Alternative scheme

On the basis of the latest Outline Zoning Plans No. S/YL/8, S/YL-LFS/4, S/YL-PS/5, S/TSW/4 and S/YL-HT/4 prepared by Planning Department, two of the works items are Designated Projects within the definition of Schedule 2 of the EIA Ordinance. Both items **AP1** and **AS1** are of type Q.1. The other items, **AS2** to **AS6**, are non-Designated Projects.

1.5.2 *Package 2A-2T – Ngau Tam Mei / San Tin Trunk Sewerage Phase 1 & Package 2B-1T – Ngau Tam Mei / San Tin Trunk Sewerage Phase 2*

On the basis of the latest outline zoning plans, two of the works items, namely, **P1**, is Designated Project of type F.3(b) within the definition of Schedule 2 of the EIA Ordinance. Items **S6** and **P4** are potential Designated Project of type Q.1 as **S6** and **P4** are located in Fan Tin Tsuen, a village of high potential archaeological or cultural significance.

The other items, namely, **S1**, **S2**, **S3**, **S4**, **S5**, **S7**, **P2**, **P3** and **P5** are non-Designated Projects.

1.5.3 *Package 2A-3T – Lau Fau Shan/Mong Tseng Trunk Sewerage & 2B-2T – Yuen Long South Branch Sewers*

Nine of the works items namely **A1**, **A2**, **B1**, **B2**, **B3**, **B4**, **B5**, **B6** and **B7** are regarded as potential Designated Project of type Q.1 or type F.3 (b) in Schedule 2 of the EIA Ordinance because they are located in villages of potential archaeological significance and their capacities may have to be increased to cater for possible development changes.

The other works items namely **G1**, **G2**, **H1**, **H2**, **H3**, **H4**, **H5**, **H6**, **H7**, **H8**, **H9**, **H10** and **H11** are non-Designated Projects.

1.6 *Contact person*

2. Outline of Planning and Implementation Programme

2.1 Design and construction supervision of the project will be carried out in-house by the Sewerage Projects Division and the Electrical and Mechanical Projects Division of Drainage Services Department. Construction will be contracted out. Operation and maintenance of the completed works will be taken up respectively by the Mainland North Division and the Sewage Treatment 1 Division of Drainage Services Department.

2.2 *Package 2A-1T – Yuen Long STW Effluent Pipeline*

Construction of the works will be undertaken through a contract scheduled to commence in May 2005 for completion in August 2007. Some parts of the works, particularly those under works items **OS2** to **OS5** in YLKTSSD scheme and **AS4** to **AS6** in alternative scheme, have interfaces with a number of other projects, including the Light Rail Extension, Ping Ha Road Improvement (Ha Tsuen Section), Deep Bay Link and Hung Shui Kiu Strategic Growth Area, and may be carried out in conjunction with such projects on a different programme where appropriate.

2.3 *Package 2A-2T – Ngau Tam Mei / San Tin Trunk Sewerage Phase 1 & Package 2B-1T – Ngau Tam Mei / San Tin Trunk Sewerage Phase 2*

Construction of the works will be undertaken through a number of contracts scheduled to commence in late 2005 for completion in late 2008. Some parts of the works, particularly those under works items **S1**, **S2** and **S3**, have interfaces with other projects, including Main Drainage Channel for Ngau Tam Mei Phase 1 and Phase 2, and may be carried out in conjunction with such projects on a different programme where appropriate. These packages will serve existing developments in particular Fairview Park, proposed low-rise developments, as well as a number of currently unsewered villages. The local sewer reticulation and pumping facilities within these areas will be implemented under a separate project.

2.4 *Package 2A-3T – Lau Fau Shan/Mong Tseng Trunk Sewerage & Package 2B-2T – Yuen Long South Branch Sewers*

Design process of the proposed sewerage works is underway. Construction of the Lau Fau Shan/Mong Tseng Sewerage is tentatively scheduled to commence in late 2005 for completion in late 2007. Construction of the Yuen Long South Sewers is tentatively scheduled to commence in late 2006 for completion in late 2008.

3. Possible Impacts on the Environment

In EPD's "Review of Yuen Long and Kam Tin Sewerage and Sewage Treatment Requirements", an Environmental Review of the proposed works has been carried out to identify possible impacts to the environment. The details are given below.

3.1 *During construction stage*

3.1.1 *Package 2A-1T – Yuen Long STW Effluent Pipeline*

(a) Air quality

Dust may be generated from some construction activities, mainly earthworks such as excavation. Gaseous emissions will also arise from construction plant. As tabulated in Section 4.1 below, some of the construction activities will be located close to village houses and residential areas.

(b) Noise

The construction activities will generate some noise through the use of conventional construction plant and equipment, like air compressors and jack hammers.

(c) Water quality

Run-off from the construction sites, particularly for the works along drainage channels, may contain sediments and silts arising from earthworks, trench dewatering and stockpiled materials, as well as fuel, oil and lubricants from construction vehicles and plant.

(d) Traffic

Construction of the proposed twin rising mains along roads and within open car park will have impacts on traffic. Also, construction-related vehicles will add to the traffic volume.

(e) Ecology

Potential impacts may include the total or partial loss of habitats such as fish ponds, wetlands and trees etc. due to construction activities of the proposed pumping station and twin rising mains between YLSTW and Tin Shui Wai, and the potential loss of some species as a result of habitat loss. General construction disturbance to nearby habitats may arise from dust, noise and intrusive lighting.

(f) Visual impacts

The presence of construction equipment and stockpiled materials in works sites may be a source of visual impacts if located close to sensitive receivers.

(g) Heritage impacts

As advised by Director of Leisure and Cultural Services, Tung Tau Tsuen Archaeological Site, Tseung Kong Wai Archaeological Site and Tseung Kong Wai So Kwun Tsai Archaeological Site are in close vicinity to the project areas of both the YLKTSSD scheme and the alternative scheme. Some historic village settlements such as Tseung Kong Wai, San Wai, Hong Mei Tsuen, Tung Tau Tsuen, Sik Kong Tsuen, Sik Kong Wai, Lo Uk Tsuen, Ha Tsuen Shi, San Uk Tsuen, Kau Lee Uk Tsuen, Ng Uk Tsuen, Shing Uk Tsuen and Tai Tseng Wai are also in close proximity to the project areas of both the YLKTSSD scheme and the alternative scheme. Therefore, the construction of the proposed sewerage works may affect the cultural setting nearby.

(h) Cumulative effects

As the project programme will overlap with those of some other major projects as mentioned in Section 2.2, there is a potential for magnification of the environmental impacts owing to cumulative effects at the locations of project interface.

(i) Construction and Demolition Materials (C&DM)

Excavation will be required for the construction of the screen chamber, dry wet/wet well, valve chamber of the proposed pumping station as well as the proposed twin rising mains and its associated chambers. Construction waste such as timber used in formwork and temporary works will also be generated. However, it is anticipated that the surplus C&DM generated will be in small amount. The project will not involve reclamation or earth filling with imported fill.

3.1.2 Package 2A-2T – Ngau Tam Mei / San Tin Trunk Sewerage Phase 1 & Package 2B-1T – Ngau Tam Mei / San Tin Trunk Sewerage Phase 2

(a) Air quality

Dust may be generated from some construction activities, mainly earthworks such as excavation. Gaseous emissions will also arise from construction plant. As tabulated in Section 4.2 below, some of the construction activities will be located close to village houses.

(b) Noise

The construction activities will generate some noise through the use of conventional construction plant and equipment, like air compressors and jack hammers.

(c) Water quality

Run-off from the construction sites, particularly for the works along drainage channels, may contain sediments and silts arising from earthworks, trench dewatering and stockpiled materials, as well as fuel, oil and lubricants from construction vehicles and plant.

(d) Traffic

Construction of the proposed trunk sewers and rising mains along roads will have impacts on traffic. Also, construction-related vehicles will add to the traffic volume.

(e) Ecology

Disturbance to the Mai Po Egretty may arise from works item S4. However, as the works will be carried out in the carriageway next to the concerned area, the impact is considered to be minimal. As works items P4 and S6 fall within Wetland Buffer Area (WBA), off-site disturbance to the wetland in the

Wetland Conservation Area (WCA) may be observed during construction. In addition, part of the works will intrude into the zones of “Other Specified Uses” annotated “Comprehensive Development to include wetland restoration area”. The impact to the wetland restoration area is relevant to the programme and the zoning of the development inside those areas. After all, general construction disturbance to nearby habitats may arise from dust, noise and intrusive lighting.

(f) Visual impacts

The presence of construction equipment and stockpiled materials in works sites may be a source of visual impacts if located close to sensitive receivers.

(g) Heritage impacts

Some historic villages such as Mai Po Lo Wai, Fan Tin Tsuen, Wing Ping Tsuen and On Lung Tsuen are located in the vicinity of the project area. Particular attention is given to work items P4 and S6 as the construction is carried out inside Fan Tin Tsuen where Man Ancestral Hall, Man Shui Yeh Ancestral Hall, Ming Tak Tong Ancestral Hall, Ming Yuen Tong Ancestral Hall and the historic villages houses are situated and in close vicinity of Tung Shan Temple as well as two Declared Monuments, namely Man Lun Fung Ancestral Hall and Tai Fu Tai; and work item S4 which is in close vicinity to Mai Po Archaeological Site. The proposed work may also affect the unknown archaeological site and historical buildings and structures.

(h) Cumulative effects

As the project programme will overlap with those of some other major projects as mentioned in Section 2.3, there is a potential for magnification of the environmental impacts owing to cumulative effects at the locations of project interface.

(i) Construction and Demolition Materials (C&DM)

Excavation will be required for the construction of the screen chamber, dry wet/wet well, valve chamber of the proposed pumping station as well as the proposed twin rising mains and its associated chambers. Construction waste such as timber used in formwork and temporary works will also be generated. However, it is anticipated that the surplus C&DM generated will be in small amount. The project will not involve reclamation or earth filling with imported fill.

3.1.3 Package 2A-3T – Lau Fau Shan/Mong Tseng Trunk Sewerage & Package 2B-2T – Yuen Long South Branch Sewers

(a) Dust

Dust may be generated from the construction activities, mainly earthworks.

(b) Noise

The construction activities will generate some noise through the use of conventional construction plants and equipment like air compressors and jack hammers.

(c) Water

During the course of construction, muddy underground water, if any, will be pumped away from the excavation pit into a silt removal facility before discharging into the nearby stormwater drains.

(d) Construction and Demolition Materials

The construction activities will generate broken concrete, asphalt and soil from excavation of trenches and sub-structure of pumping stations.

(e) Heritage impacts

For Package 2A-3T, the proposed work may affect Mong Tseng Archaeological Site, Lau Fau Shan Archaeological Site and the historic buildings and structures inside the historic villages such as San Hing Tsuen, Ngau Hom, Sha Kong Wai, Sha Kong Wai Tsai, Mong Tseng Tsuen and Mong Tseng Wai.

For Package 2B-2T, the project areas near work items H1 and B1 are considered to be of archaeological potential. Some historic villages such as Shan Ha Tsuen, Tin Liu Tsuen, Muk Kiu Tau Tsuen, Shui Tsiu San Tsuen, Tai Tong Tsuen, Shung Ching San Tsuen, Shui Tsiu Lo Wai, Hung Tso Tin Tsuen and Tong Tau Po Tsuen are located in the proximity of the project areas. Particular attention is given to work item B1 as the proposed pumping station is to be constructed inside Shan Ha Tsuen where the Cheung Ancestral Hall, a Declared Monument is situated. The proposed works may affect these items of cultural heritage.

3.2 *During operation stage*

3.2.1 *Package 2A-1T – Yuen Long STW Effluent Pipeline*

(a) Air quality

Odour emission from the wet wells/screening removal area of the proposed pumping station can be a source of air quality impact. The potential for odour impacts is higher where the treated effluent retention time in rising mains is long, particularly in the summer months.

(b) Water quality

The long-term water quality of the project area will be greatly enhanced as a result of the collection, treatment and proper disposal of sewage after the project is commissioned. Nevertheless, there are risks associated with the failure of pumping stations or the blockage or damage to the twin rising mains, in which case bypass of sewage to the environment may result.

(c) Noise

The pumps and the extraction fans of ventilation system at the pumping station as well as the installed air relief valves along the rising mains and in the pumping station are potential noise sources during operation of the project.

(d) Ecology

In the case of treated effluent being bypassed to nearby watercourses and fish ponds, the water quality, aquatic organisms and avifauna feeding in these wetlands may be affected.

(e) Visual impacts

Aesthetics is an important factor to be considered in the design of the superstructures of the proposed works, particularly the proposed pumping station which will be located on a relatively open area.

(f) Waste

Large-aperture screens will be installed at the pumping station to prevent large solid materials in treated effluent from entering the pumps and causing damage. A small quantity of screenings will thus be generated.

3.2.2 Package 2A-2T – Ngau Tam Mei / San Tin Trunk Sewerage Phase 1 & Package 2B-1T – Ngau Tam Mei / San Tin Trunk Sewerage Phase 2

(a) Air quality

Odour emission from the wet wells/screening removal area of the proposed pumping stations can be a source of air quality impact. Hydrogen sulphide is the primary source of odour nuisance. The potential for odour impacts is higher where the sewage retention time in rising mains/gravity sewers is long, particularly in the summer months.

(b) Water quality

The long-term water quality of the project area will be greatly enhanced as a result of the collection, treatment and proper disposal of sewage after the project is commissioned. Nevertheless, there are risks associated with the failure of pumping stations or the blockage or damage to a rising main, in which case bypass of sewage to the environment may result.

(c) Noise

The pumps, the extraction fans of ventilation systems at the pumping stations and the air relief valves along the rising mains are potential noise sources during operation of the project.

(d) Ecology

In the case of sewage being bypassed to watercourses and fish ponds, the avifauna feeding in these wetlands may be affected. As works items P4 and S6 fall within WBA, off-site disturbance to the wetland in WCA may be observed.

(e) Visual impacts

Aesthetics is an important factor to be considered in the design of the superstructures of the proposed works, particularly the work items P1 and P3 which will be located on a relatively open area next to San Tin Highways. For pumping station P4, which is located in adjacent to village houses or residential developments, aesthetics is a major concern.

(f) Waste

Large-aperture screens will be installed at the pumping stations to prevent the large solid materials in sewage from entering the pumps and causing damage. The quantity of screenings generated is expected to be small.

3.2.3 Package 2A-3T – Lau Fau Shan/Mong Tseng Trunk Sewerage & Package 2B-2T – Yuen Long South Branch Sewers

(a) Odour

The wet well and the screening removal area of the pumping station would be sources of odour nuisance if no mitigation measure is incorporated into the design of the pumping station.

(b) Water quality

The proposed pumping station is an integral part of the Yuen Long and Kam Tin sewerage works. It will collect sewage generated from Lau Fau Shan/Mong Tseng and Yuen Long South to the San Wai sewage treatment works for treatment before discharging to Urmston Road. Implementation of the pumping stations will enhance the water quality of the surrounding environment, and will not cause any adverse impact except if sewage is bypassed. In such case, it will be discharged into the nearby drainage channel. However, with the implementation of preventive measures described in paragraph 5.2.3(b) below, the probability of bypass will be extremely remote.

(c) Noise

The pumps, extraction fans of the de-odourizer and installed air relief valves along the rising mains/pumping stations are potential noise sources during their operation.

(d) Waste

Screens will be installed at the inlet of the pumping station to prevent large solid materials in sewage from entering the pumps and causing damage. A small quantity of screenings will thus be generated.

(e) Aesthetics

In order to minimize the visual impact of the proposed pumping station, aesthetics will be a key factor to be considered.

4. Major Elements of the Surrounding Environment

4.1 Package 2A-1T – Yuen Long STW Effluent Pipeline

The proposed works under both schemes (YLKTSSD scheme and alternative scheme) cover an extensive area divided into zones for various uses including village type development, comprehensive development area, recreation, green belt, conservation area, undetermined, residential (group D) and other specified uses. The sensitive receivers in the vicinity of each proposed works item are tabulated below.

Works item	Details of works	Sensitive receivers nearby	Approximate minimum distance apart (m)
OP1	Pumping station in the north of YLSTW	Ng Uk Tsuen in the southwestern side Conservation Area ^{Note 1} (CA) in the west of Shan Pui River	780 0 (works within the boundary of the CA)
OS1	Twin rising mains from item OP1 to Tin Tsz Road in Tin Shui Wai	Village houses at Tai Tseng Wai, Ng Uk Tsuen and Shing Uk Tsuen near Fuk Shun Street Residential (Group B) ^{Note 1} (R(B)) alongside Tin Wah Road in Tin Shui Wai Conservation Area ^{Note 1} (CA) in the west of Shan Pui River	30 220 0 (works within the boundary of the CA)
OS2	Twin rising mains from Tin Tsz Road via Tin Wah Road to Tin Ying Road in Tin Shui Wai	Residential (Group A) ^{Note 1} (R(A)) alongside Tin Wah Road in Tin Shui Wai Residential (Group B) ^{Note 1} (R(B)) alongside Tin Wah Road in Tin Shui Wai School near Tin Shing Road	5 5 75
OS3	Twin rising mains along Tin Ying Road in Tin Shui Wai	Comprehensive Development Area ^{Note 1} (CDA) in the west of Ting Ying Road Residential (Group A) ^{Note 1} (R(A)) in the east of Tin Ying Road Residential (Group B) ^{Note 1} (R(B)) in the east of Tin Ying Road	65 120 120
OS4	Twin rising mains from Tin Ying Road to Ping Ha Road	Village Type Development ^{Note 1} (V) of Ha Tsuen Sha Chau Lei Tsuen	30 40

OS5	Twin rising mains from Ping Ha Road via Tin Ha Road to SWSTW	Village Type Development ^{Note 1} (V) of Ha Tsuen San Uk Tsuen Kau Lee Uk Tsuen Tseung Kong Wai Archaeological Site, Tseung Kong Wai So Kwun Tsai Archaeological Site and the historic buildings and structures inside the old villages such as Tseung Kong Wai, San Wai, Hong Mei Tsuen, Tung Tau Tsuen, Lo Uk Tsuen, Sik Kong Tsuen, Sik Kong Wai, Ha Tsuen Shi and San Uk Tsuen	5 200 100 Subject to the results of the Heritage Impact Assessment to be conducted before any construction works take place.
AP1	Pumping station in the north of YLSTW	Ng Uk Tsuen in the southwestern side Conservation Area ^{Note 1} (CA) adjoining the west of Shan Pui River	780 0 (works within the boundary of the CA)
AS1	Twin rising mains in the northwestern side of YLSTW	Ng Uk Tsuen in the southwestern side Conservation Area ^{Note 1} (CA) adjoining the west of Shan Pui River	410 0 (works along the boundary of the CA)
AS2	Twin rising mains from item S1 to Fuk Shun Street	Tai Tseng Wai in the west Ng Uk Tsuen in the west	10 120
AS3	Twin rising mains from Fuk Shun Street to Tin Wah Road in Tin Shui Wai	Village houses at Tai Tseng Wai, Ng Uk Tsuen and Shing Uk Tsuen alongside Fuk Shun Street Conservation Area ^{Note 1} (CA) in the north for comprehensive development and wetland enhancement area Conservation Area ^{Note 1} (CA) in the south adjacent to Wang Chau Fresh Water Service Reservoir	5 130 5
AS4	Twin rising mains between Tin Wah Road and Tin Ying Road in Tin Shui Wai	Residential (Group A) ^{Note 1} (R(A)) alongside Tin Wah Road in Tin Shui Wai Residential (Group B) ^{Note 1} (R(B)) alongside Tin Wah Road in Tin Shui Wai School near Tin Shing Road	5 5 75

AS5	Twin rising mains from item S4 to Ping Ha Road	Comprehensive Development Area ^{Note 1} (CDA) alongside Ping Ha Road	5	Subject to the results of the Heritage Impact Assessment to be conducted before any construction works take place.
		Residential Zone 3 ^{Note 2} (R3) in the east of Ping Ha Road	5	
		Tung Tau Tsuen in the south	200	
		Village Type Development ^{Note 1} (V) of Ha Tsuen	100	
AS6	Twin rising mains from item S5 to SWSTW	Village houses alongside Ping Ha Road	5	Subject to the results of the Heritage Impact Assessment to be conducted before any construction works take place.
	Fung Kong Tsuen in the north	200		
	Village Type Development ^{Note 1} (V) of Ha Tsuen	150		
	Tung Tau Tsuen Archaeological Site, Tseung Kong Wai So Kwun Tsai Archaeological Site, Tseung Kong Wai Archaeological Site and the historic buildings and structures inside the old villages such as Tseung Kong Wai, San Wai, Hong Mei Tsuen, Tung Tau Tsuen, Lo Uk Tsuen, Sik Kong Tsuen, Sik Kong Wai, Ha Tsuen Shi, San Uk Tsuen and Fung Kong Tsuen			

* Note 1: From the prevailing OZPs.

Note 2: From the proposed Hung Shui Kiu Development Plan

4.2 Package 2A-2T – Ngau Tam Mei / San Tin Trunk Sewerage Phase 1 & Package 2B-1T – Ngau Tam Mei / San Tin Trunk Sewerage Phase 2

The project covers an extensive area divided into zones for various uses including residential, commercial, and recreation, plus village areas and conservation areas, and areas of undetermined use. The proposed sewers will principally be routed through the access road along the main drainage channels and other public roads. The sensitive receivers in the vicinity of each of the proposed works items are tabulated below.

Works Item	Details of works	Sensitive receivers nearby	Approximate minimum distance apart (m)

P1	Ngau Tam Mei sewage pumping station	Yau Mei San Tsuen and Chuk Yuen Tsuen	20
		a kindergarten in Chuk Yuen Tsuen	50
		a school in Chuk Yuen Tsuen	170
S1	Sewers along Main Drainage Channel for Ngau Tam Mei Phase 1	a recreational area and a zone for “Other Specified Used” annotated “Comprehensive Development to include Wetland Restoration Area” (“OU(CDWRA)”) adjoining the drainage channel Man Yuen Chuen a residential (R(D)) zone WBA/WCA	5 (work along the access road on the boundary of the areas)
S2	Branch sewers in front of the Fairview Park and along Main Drainage Channel for Ngau Tam Mei Phase 1	Fairview Park (R(C))	2 (works inside the area)
		Yau Mei San Tsuen WBA and a recreational area adjoining the drainage channel	20 2 (work along the access road on the boundary of the area)
P2	Tam Mei Barracks sewage pumping station	Yau Tam Mei Tsuen Fish pond and agricultural land	70 2 (works next to affected area)
		Tam Mei Barracks	100
S3	Branch sewers along Main Drainage Channel for Ngau Tam Mei, Phase 2 near Yau Tam Mei Tsuen	Yau Tam Mei Tsuen, Yau Tam Mei San Tsuen and other villages along the channel	30
S4	Sewers from P3 to P1 along Castle Peak Road	Palm Springs and Royal Palms (R(C))	40
		Maple Garden and Casa Paradizo (R(C))	10
		villages on either side of the Mai Po San Tsuen and Mai Po Lo Wai	10
		Mai Po Egrettry	2 (works along the carriageway of Castle Peak Road)
		a school in Mai Po San Tsuen near San Tin Highway	20
		WBA and a residential (R(D)) zone and a zone of “OU(CDWRA)”	5 (works along the carriageway of Castle Peak Road)
Mai Po Archaeological Site	5 (works along the carriageway of Castle Peak Road) Subject to the results of the Heritage Impact Assessment to be conducted before the construction takes place.		

P3	San Tin sewage pumping station	Village houses of Tsing Lung Tsuen	30
		a residential (R(D)) zone	30
		other villages on another side of San Tin Highway	30
S5	Sewer upstream of P3 near Tsing Lung Tsuen	village houses of Tsing Lung Tsuen and other villages on either side of the carriageway	30
P4	San Lung Tsuen sewage pumping station	Village house of Fan Tin Tsuen, Wing Ping Tsuen and On Lung Tsuen.	Subject to the results of the Heritage Impact Assessment to be conducted before the construction takes place.
		Historical building inside Fan Tin Tsuen such as Man Ancestral Hall, Man Shui Yeh Ancestral Hall, Ming Tak Tong Ancestral Hall and Ming Yuen Tong Ancestral Hall.	
		Nearby Declared Monuments and historic building such as Man Lun Fung Ancestral Hall, Tai Fu Tai and Tung Shan Temple.	
		a kindergarten inside Fan Tin Tsuen WBA	
		a stream course adjoining Fan Tin Tsuen	5 (only for the alternative location)
S6	Branch sewers from P4 within Fan Tin Tsuen	Village house of Fan Tin Tsuen as well as historic buildings thereat such as Man Ancestral Hall, Man Shui Yeh Ancestral Hall, Ming Tak Tong Ancestral Hall and Ming Yuen Tong Ancestral Hall.	Subject to the results of the Heritage Impact Assessment to be conducted before the construction takes place.
		Nearby Declared Monuments and historic building such as Man Lun Fung Ancestral Hall, Tai Fu Tai and Tung Shan Temple.	
		a kindergarten inside Fan Tin Tsuen WBA	
P5	San Tin Barracks sewage pumping station	Village house of Siu Hum Tsuen	10
S7	Branch sewer from P5 to S5	Village house of Siu Hum Tsuen and grave sites on the roadside	0 (works along the feeder road which will be close to them)

4.3 *Package 2A-3T – Lau Fau Shan/Mong Tseng Trunk Sewerage & Package 2B-2T – Yuen Long South Branch Sewers*

The packages cover an extensive area divided into zones of various uses. The proposed sewers will principally route through public roads and access roads along drainage channels. The sensitive receivers in the vicinity of the proposed pumping stations are tabulated below.

Works Item	Details of works	Sensitive receivers nearby	Approximate distance apart (m)
A1	Lau Fau Shan sewage pumping station	village houses in Lau Fau Shan Village,	30
		a primary school in Lau Fau Shan Village,	100
		a residential R(C) zone	10
G1	Sewers from A1 to TSWRZPS	village houses in Lau Fau Shan Village,	20
		a residential R(C) zone, village houses in San Hing Tsuen, Ngau Hom, Sha Kong Wai and Sha Kong Wai Tsai	20 30 subject to the results of the HIA to be conducted
A2	Mong Tseng sewage pumping station	village houses in Mong Tseng Tsuen, Mong Tseng Archaeological Site and historic buildings and structures inside Mong Tseng Tsuen and Mong Tseng Wai respectively	30 subject to the results of the HIA to be conducted
G2	Sewers along Lau Fau Shan Road from A2 to TSWRZPS	village houses in Mong Tseng Tsuen	30
B1	Shan Ha Tsuen sewage pumping station	village houses in Shan Ha Tsuen, village houses of Lam Hau Tsuen, The Cheung Ancestral Hall, a Declared Monument	30 subject to the results of the HIA to be conducted
H1	Sewers from B1 to Yuen Long Highway	village houses in Shan Ha Tsuen and Tin Liu Tsuen	30
		village houses in Lam Hau Tsuen	120
B2	Muk Kiu Tau Tsuen sewage pumping station	village houses in Muk Kiu Tau Tsuen	30
		village houses in Tin Liu Tsuen	100
H2	Sewers along Kung Um Road from B2 to Yuen Long Highway	village houses in Muk Kiu Tau Tsuen	30
		village houses in Tin Liu Tsuen	100
B3	Sham Chung Tsuen sewage pumping station	a residential R(D) zone	10
H3	Sewers from B3 to Yuen Long Highway	a residential R(D) zone	10
		village housed in Sham Chung Tsuen	10

B4	Shui Tsiu San Tsuen sewage pumping station	village houses in Shui Tsiu San Tsuen	10
H4	Sewers from B4 to B3	a residential R(D) zone village houses in Shui Tsiu San Tsuen	10 10
H5	Sewers from Tai Tong Tsuen to B4	village houses in Tai Tong Tsuen a school near Tai Tong Tsuen	20 20
B5	Shung Ching San Tsuen sewage pumping station	village houses in Shum Chung Tsuen and Shung Ching San Tsuen a school in Shung Ching San Tsuen	20 90
H6	Sewers along Tai Tong Road from Hung Tso Tin Tsuen to B5	village houses in Hung Tso Tin and Nam Hang Tsuen	10
H7	Sewers from B5 to Yuen Long Highway	village houses in Shui Tsiu Lo Wai village houses in Sham Chung Tsuen	20 80
B6	Nga Yiu Tau sewage pumping station	a residential R(D) zone village houses in Nga Yiu Tau and Tong Tau Po Tsuen	10 40
H8	Sewers along Tai Shu Ha Road East from Tong Tau Po Tsuen to B6	village houses in Tong Tai Po Tsuen village houses in Shui Tsiu Lo Wai	10 30
H9	Sewers along Tai Shu Ha Road East from B6 to Yuen Long Highway	a residential R(D) zone village houses in Shung Ching San Tsuen	10 10
B7	Pak Sha Tsuen sewage pumping station	village houses in Pak Sha Tsuen a residential R(C) zone	80 50
H10	Sewers along Kung Um Road from Wong Nai Tun Tsuen to B7	village houses in Wong Nai Tun Tsuen	20
H11	Sewers from B7 to B2	warehouses along Kung Um Road	20

5. Environmental Protection Measures to be Incorporated in the Design and Further Environmental Implications

5.1 Before or during construction stage

5.1.1 Package 2A-1T – Yuen Long STW Effluent Pipeline

(a) Air quality

Air quality impacts, mainly dust, generated by the construction activities will be minimized by the adoption of proper working methods such as regular water spraying, installation of wheel-washing facilities where practical, and shielding of stockpiled materials. Relevant clauses will be incorporated into the contract documents to this end.

(b) Noise

The contractors for the works will have to comply with the provisions of the Noise Control Ordinance. Although some of the construction activities will be undertaken in close vicinity to residential areas and village houses, the activities are generally of short durations only. Where the works are located close to a school, the works may be scheduled where necessary to avoid sensitive periods like examination time.

(c) Water quality

Close control, such as the requirement to install settlement tanks to remove sand and silt, will be exercised on the quality of effluent from the construction sites to ensure its compliance with the Water Pollution Control Ordinance.

(d) Traffic

Where works are carried out on roads and within open car park, temporary traffic arrangement measures will be undertaken to maintain traffic flow and minimize traffic impacts. Rising mains falling within proposed roadworks areas would be undertaken in conjunction with the roadworks through entrustment arrangements where possible and appropriate.

(e) Ecology

Construction works areas will be planned to avoid the loss of ponds and tree felling wherever possible. It is important that measures to control construction runoff and drainage are fully implemented to minimize impacts on the water quality of the surrounding fish ponds and streams, and thereby minimize the potential for resulting ecological impacts. Pollution control measures will also be undertaken to alleviate the ecological impacts arising from dust and noise generated by the construction activities.

As advised by DPO/TMYL and CTP/SR, Plan D, a detailed ecological impact assessment including wetland compensation and management schemes is required to demonstrate that the proposed sewerage works falling within the Wetland Conservation Area will not result in a net loss in wetland function and negative disturbance impact.

(f) Visual impacts

At most parts of the works site, visual impacts from construction activities will be of very short durations. Proper control over site cleanliness and the stockpiling of materials will be exercised to alleviate visual intrusion.

(g) Cultural heritage

As advised by Director of Leisure and Cultural Services, a Heritage Impact Assessment (HIA), methods agreed with the Antiquities and Monument Office (AMO) will be conducted to identify all known and unknown sites of archaeological interest, all pre-1950 buildings and structures, selected post-1950 buildings and structures of high architectural and historical significance

and interest as well as historic landscape features and sites or providing a significant historical record or setting for buildings or monuments of architectural or archaeological importance, historic field patterns, tracks and cultural element such as *fungshui* woodlands and clan graves which are located within or in close proximity to the project area, that might be affected. The HIA should assess the direct and indirect impacts on all the identified archaeological sites, historic buildings and structures, and historic village settlements of any known and unknown archaeological sites and historical structures within the project areas and to assess the impact on them by the proposed work. Subject to the results of the HIA, appropriate mitigation measures agreed with the AMO will be designed and implemented to preserve the sites of cultural heritage *in-situ* as far as possible. The HIA will be carried out by qualified persons with proven records related to built heritage research in Hong Kong. For the archaeological aspect of the assessment, the responsible archaeologist should obtain a License from the Antiquities Authority before undertaking the archaeological field work.

(h) Construction and Demolition Materials (C&DM)

Although it is anticipated that the surplus C&DM generated will be in small amount, consideration will be given in the design to minimize the amount of excavation so as to reduce the amount of C&DM. Moreover, a trip-ticket system will be implemented to control the disposal of C&DM. The C&DM will be sorted on-site to facilitate reuse, recycling and disposal as appropriate. Furthermore, the use of timber will as far as practicable be replaced by steel in formwork and temporary works to reduce the generation of waste.

5.1.2 Package 2A-2T – Ngau Tam Mei / San Tin Trunk Sewerage Phase 1 & Package 2B-1T – Ngau Tam Mei / San Tin Trunk Sewerage Phase 2

(a) Air quality

Air quality impacts, mainly dust, generated by the construction activities will be minimized by the adoption of proper working methods such as regular water spraying, installation of wheel-washing facilities where practical, and shielding of stockpiled materials. Relevant clauses will be incorporated into the contract documents to this end.

(b) Noise

The contractors for the works will have to comply with the provisions of the Noise Control Ordinance. Although some of the construction activities will be undertaken in close vicinity to village houses, the activities are generally of short durations only. Where the works are located close to a school, the works may be scheduled where necessary to avoid sensitive periods like examination time.

(c) Water quality

Close control, such as the requirement to install settlement tanks to remove sand and silt, will be exercised on the quality of effluent from the construction sites to ensure its compliance with the Water Pollution Control Ordinance.

(d) Traffic

Where works are carried out on roads, temporary traffic arrangement measures will be undertaken to maintain traffic flow and minimize traffic impacts.

(e) Ecology

Pollution control measures will be undertaken to alleviate the ecological impacts arising from dust and noise generated by the construction activities. A detailed ecological impact assessment will be carried out to demonstrate that the proposed sewerage works falling within the Wetland Conservation Area will not result in a net loss in wetland function and negative disturbance impact.

(f) Visual impacts

At most parts of the works site, visual impacts from construction activities will be of very short durations. Proper control over site cleanliness and the stockpiling of materials will be exercised to alleviate visual intrusion.

(g) Cultural Heritage

A Heritage Impact Assessment (HIA) should be conducted before any works commence. The HIA should include a comprehensive inventory of all known and unknown sites of archeological and historic interests, all pre-1950 buildings and structures, selected post-1950 buildings and structures of high archeological, architectural and historic significance and interest as well as historic landscape features and sites or providing a significant historic record or setting for buildings or monuments of archeological importance, historic field patterns, tracks and cultural element such as *fungshui* woodlands and clan graves which are located within or in close proximity to the project areas, that might be affected. The HIA should assess the direct and indirect impacts on all the identified historic buildings and structures, and historic villages. Landscape and visual impacts on the built heritage due to vibration and demolition associated with the construction activities should be assessed. Possible alternatives and mitigation measures to avoid and minimize the impacts on each of the identified cultural heritage should be agreed by the Antiquities and Monuments Office (AMO) before the commencement of any works on site. The HIA should be carried out by qualified persons with proven records related to built heritage research in Hong Kong so as to protect the buildings against any damage caused by the project. For archeological investigation, the responsible archeologist should obtain a Licence from the Antiquities Authority before undertaking the fieldwork of the investigation.

For works item S7, consideration will be taken to avoid affecting the grave sites on the roadsides such as adjusting the pipe alignment.

(h) Construction and Demolition Materials (C&DM)

Although it is anticipated that the surplus C&DM generated will be in small amount, consideration will be given in the design to minimize the amount of

excavation so as to reduce the amount of C&DM. Moreover, a trip-ticket system will be implemented to control the disposal of C&DM. The C&DM will be sorted on-site to facilitate reuse, recycling and disposal as appropriate. Furthermore, the use of timber will as far as practicable be replaced by steel in formwork and temporary works to reduce the generation of waste.

5.1.3 Package 2A-3T – Lau Fau Shan/Mong Tseng Trunk Sewerage & Package 2B-2T – Yuen Long South Branch Sewers

(a) Dust

The effect of dust generation from the construction works is expected to be insignificant with the implementation of proper mitigation measures. The impact will be minimized by the adoption of proper working methods such as regular water spraying and providing wheel-washing facilities. Relevant clauses will be incorporated into the contract documents in this regard.

(b) Noise

The construction activities involved in the project will include earthworks and general concrete building works. Common construction plant including backhoe, concrete mixer, vibratory poker, pneumatic breaker and the like will be used. It is anticipated that only minor noise impacts will be generated. Notwithstanding this, clauses will be incorporated into the construction contract requiring the contractor to comply with the Noise Control Ordinance, Technical Memorandum of the Environmental Impact Assessment Ordinance (EIAO) and other relevant regulations so as to control the noise level within acceptable limit during the construction stage.

(c) Water

It is anticipated that minor water quality impact will be generated during excavation works. The contractor will be required to provide, where necessary, a silt removal facility on site so as to remove the silt before discharging into the nearby stormwater drains. Such a silt removal facility will be provided by the contractor on site before commencement of the excavation.

(d) Construction and Demolition Materials

A large proportion of the excavated soil will be used as backfill material for the sewer alignments. The remaining excavated soil, broken concrete and asphalt will be disposed off site. The contractor will be required to implement a trip-ticket system for the disposal of all construction and demolition materials at designated public filling facilities.

(e) Heritage impacts

For Package 2A-3T, Heritage Impact Assessment (HIA), methods agreed with the Antiquities and Monuments Office (AMO) will be conducted to identify any known and unknown archaeological sites and historical structures within the project areas and to assess the impact on them by the

proposed work. Subject to the result of the assessment, appropriate mitigation measures agreed with the AMO will be designed and implemented to preserve the sites of cultural heritage in-situ as far as possible. For the archaeological aspect of the assessment, the responsible archaeologist should obtain a licence from the Antiquities Authority before undertaking the archaeological fieldwork. For the built heritage aspect of the assessment, the responsible persons should obtain proven records related to built heritage research in Hong Kong.

For Package 2B-2T, the HIA will be conducted to identify any known and unknown archaeological sites and buildings and structures of high architectural and historical significance and interest as well as historic landscape features and sites within or in the close proximity of the project areas and to assess both the direct and indirect impacts on them by the development. Subject to the result of the investigation, appropriate mitigation measures agreed with the AMO will be designed and implemented to preserve the sites of cultural remains underground in-situ as far as possible.

5.2 *During operation stage*

5.2.1 *Package 2A-1T – Yuen Long STW Effluent Pipeline*

(a) Air quality

Enclosure of the pollutant source with appropriate ventilation/odour control will be implemented for the proposed pumping station to minimize the air quality impacts arising. Further mitigation measures to reduce the possibility of treated effluent septicity caused by long retention time in wet wells and rising mains may also be necessary in some of the proposed works.

(b) Water quality

Standby pump will be provided to cater for breakdown and maintenance of the duty system to avoid sewage bypass. Twin rising mains will be provided to facilitate inspection and maintenance. Dual power supply in the format with two CLP's transformer supplies with bus-section breaker or backup power supply from emergency generator will be provided as far as practicable to reduce the risk of power failure. A central monitoring system will be provided in a designated sewage treatment works in order to display the operating information of the installed equipment and send signals showing irregularity or any operation problem of the pumping station such that immediate action can be taken in case of emergency. Due consideration will be given to the presence of sensitive receivers when determining the location of the emergency bypass outlets. Manual screen will also be provided for the emergency bypass.

(c) Noise

To minimize any noise impacts generated from pump operation, all pumps will be enclosed in structures. Extraction fans will be located away from the

sensitive receivers as far as practicable. Acoustic enclosure will be provided if necessary.

(d) Ecology

The water quality impact mitigation measures to be implemented to reduce the need for treated effluent bypass will also alleviate the potential of ecological impacts.

As advised by DPO/TMYL and CTP/SR, Plan D, a detailed ecological impact assessment including wetland compensation and management schemes is required to demonstrate that the proposed sewerage works falling within the Wetland Conservation Area will not result in a net loss in wetland function and negative disturbance impact.

(e) Visual impacts

Architectural features and landscaping works will be provided to the superstructures of the proposed pumping station.

(f) Waste

Screenings generated at the pumping station will be enclosed in plastic bags before being transported to landfills.

5.2.2 Package 2A-2T – Ngau Tam Mei / San Tin Trunk Sewerage Phase 1 & Package 2B-1T – Ngau Tam Mei / San Tin Trunk Sewerage Phase 2

(a) Air quality

Enclosure of the pollutant source with appropriate ventilation/odour control will be implemented for the proposed pumping stations to minimize the air quality impacts arising. Further mitigation measures to reduce the possibility of sewage septicity caused by long retention time in wet wells and rising mains may also be necessary in some of the proposed works.

(b) Water quality

To minimize water quality impacts arising from the bypass of sewage, standby pumps will be provided to cater for breakdown and maintenance of the duty system. Dual power supply in the format with two CLP's transformers supplies with bus-section breaker or backup power supply from emergency generator will be provided as far as practicable to reduce the risk of power failure. Twin rising main is also proposed to further reduce the chance of bypass of sewage and facilitate inspection and maintenance. A central monitoring system will be provided in a designated sewerage facilities in order to display the operating information of the installed equipment and send signals showing irregularity or any operation problem of the pumping station such that immediate action could be taken in case of emergency. Due consideration will be given to the presence of sensitive receivers when

determining the location of the emergency bypass outlets. Manual screen will be provided for the emergency bypass.

(c) Noise

To minimize any noise impacts generated from pump operation, all pumps will be enclosed in structures and, for the smaller pumping stations, located underground in the wet well. Acoustic enclosure will be provided if necessary. Extraction fans will be located away from the sensitive receivers as far as practicable.

(d) Ecology

The water quality impact mitigation measures to be implemented to reduce the need for sewage bypass will also alleviate the potential of ecological impacts.

(e) Visual impacts

Architectural features and landscaping works will be provided to the superstructures of the proposed pumping stations.

(f) Waste

Screenings generated at the sewage pumping stations will be enclosed in plastic bags before being transported to landfills.

5.2.3 Package 2A-3T – Lau Fau Shan/Mong Tseng Trunk Sewerage & Package 2B-2T – Yuen Long South Branch Sewers

(a) Odour

To minimize odour impacts, the wet well of the proposed pumping station will be located underground and enclosed by air-tight covers. A reinforced concrete superstructure will be provided to enclose the underground substructures including the wet well, inlet chamber, screening chamber, etc. In addition, a de-odourizer and a forced ventilation system will be installed to remove odour before discharging air from the pumping station to open air. With these measures incorporated into the design of the pumping station, it is anticipated that potential odour impacts can be mitigated.

(b) Water quality

To minimize water quality impacts arising from the bypass of sewage, a standby pump will be provided to cater for breakdown and maintenance of the duty pump so as to avoid sewage bypass. In order to minimize the chance of power failure, dual power supply in the format with two CLP's transformer supplies with bus-section breaker or backup power supply from emergency generator will be provided if necessary. In addition, a central monitoring system will be provided in a designated sewage treatment works in order to display the operating information of the installed equipment and send signals showing irregularity or any operation problem of the pumping station such that immediate actions could be taken in case of emergency. Besides that, the

rising mains are designed as twin so as to facilitate inspection, maintenance and pipe replacement works by closing one main and operating the other. With all these measures incorporated into the design of the pumping station, it is anticipated that the chance of emergency sewage bypass will be extremely remote.

(c) Noise

To minimize potential noise impact from operating pumps, all the pumps will be located underground and be enclosed inside the pumping station superstructure. Acoustic filters will be installed at the extraction fans of the de-odourizer if necessary. The noise impact of the pumping station on the nearest noise sensitive receiver will be within acceptable limit.

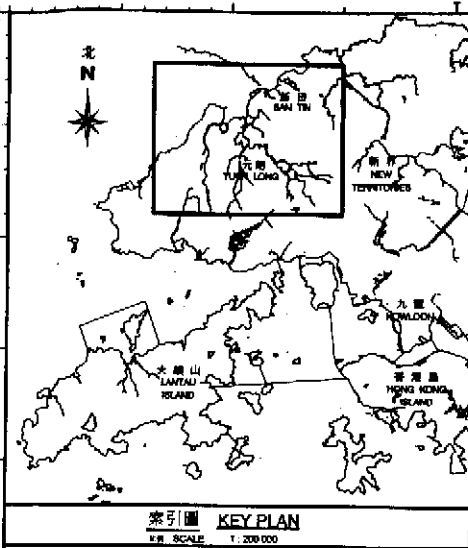
(d) Waste

The screenings of the sewage will be enclosed in plastic bags. This operation will be conducted inside the pumping station. The screenings will then be transported to landfill site for disposal.

(e) Visual impacts

Aesthetics will be a major consideration in the design of the pumping station. Architectural aspects of the pumping station including colour scheme, types of external finishing and layout of the pumping station will be carefully designed taking into account the features of surrounding land and buildings. Moreover, plantation will also be provided to further improve the aesthetic appearance of the pumping station.

The Environmental Review mentioned in Section 3 concluded that no insurmountable environmental impacts were identified for either construction or operation of the proposed works, but mitigation measures had to be formulated to reduce the environmental impacts to acceptable levels.



后海湾
DEEP BAY
(HAU HOI WAN)

2A-3T 部分
流浮山 / 灣仔灣水主幹管
PACKAGE 2A-3T
LAU FAU SHAN / MONG TSENG
TRUNK SEWERAGE

2A-1T 部分
元朗污水處理廠淨化水的轉運系統工程
PACKAGE 2A-1T
YUEN LONG SEWAGE TREATMENT
WORKS EFFLUENT PIPELINE

2A-2T 及 2B-1T 部分
牛潭尾 / 新田污水主幹管
第1及2期工程
PACKAGE 2A-2T & 2B-1T
NGAU TAM MEI / SAN TIN
TRUNK SEWERAGE PHASE 1 & 2

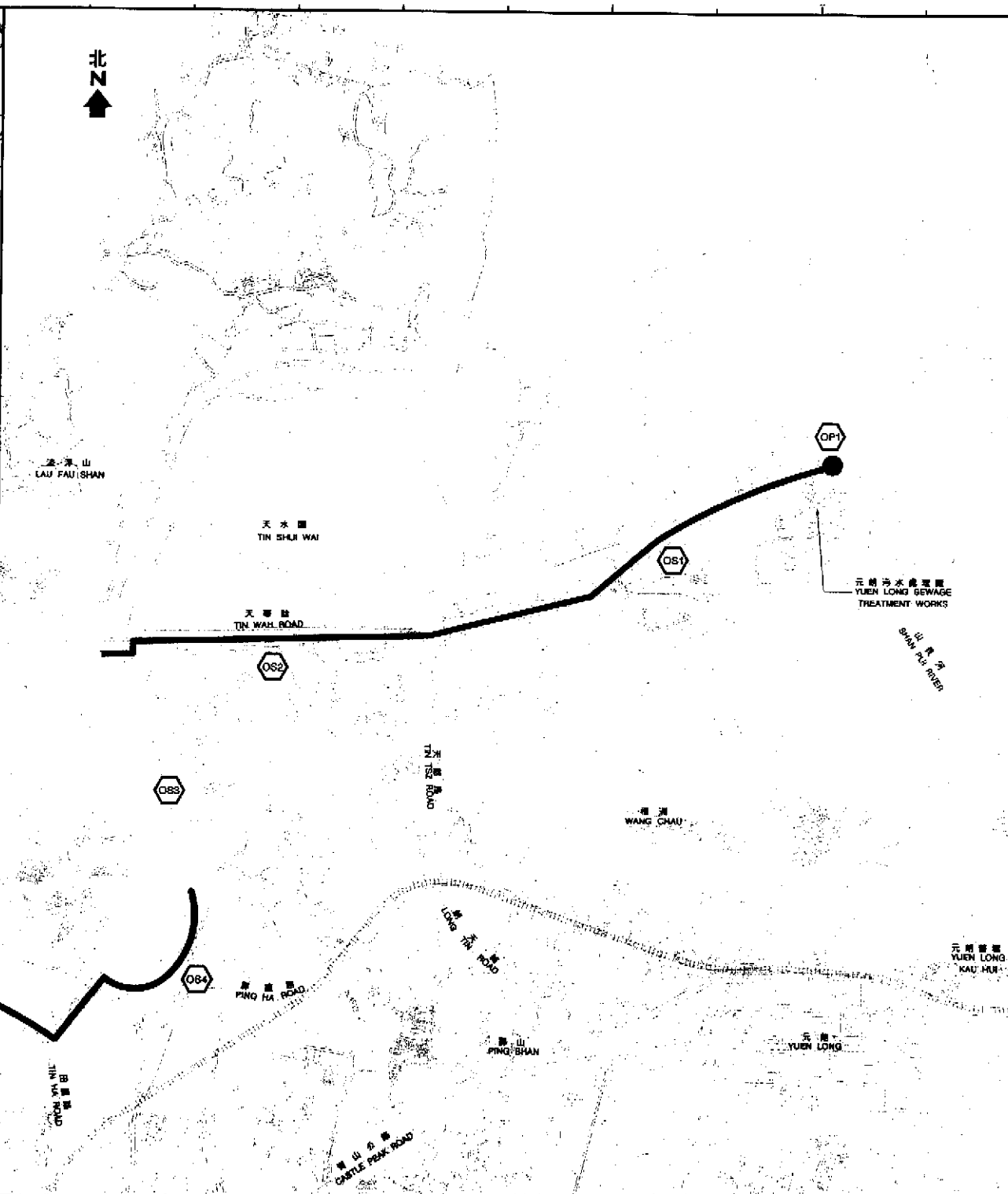
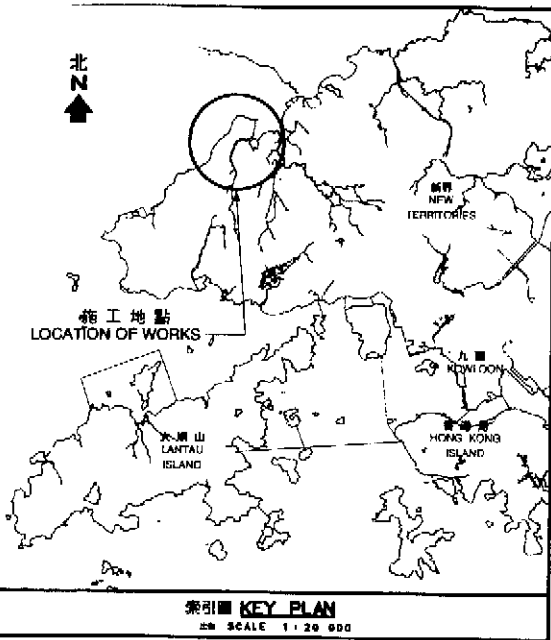
2B-2T 部分
元朗南分支污水管
PACKAGE 2B-2T
YUEN LONG SOUTH
BRANCH SEWER

NOTES :

圖例 LEGEND :

- 建議污水管 PROPOSED SANITARY SEWER
- 建議污水管電力管 PROPOSED FIBRE OPTIC
- 建議污水抽水站 PROPOSED PUMPER STATION

Drawn	Checked	Initial
SIGNATURE		
Reviewed	SIGNED	W. M. LEE
		JULY 07
Drawn	SIGNED	P. K. LAM
		JULY 07
Checked	SIGNED	W. M. LEE
		AUG. 01
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SEWERAGE PROJECTS DIVISION		



NOTES:

圖例 LEGEND:

- 建議設置之抽水站
PROPOSED PUMPING STATION UNDER WORKS ITEM OP1
- 建議設置之(圓形)污水渠
PROPOSED TWIN RING MAINS UNDER WORKS ITEM OS1
- 建議設置之(圓形)污水渠
PROPOSED TWIN RING MAINS UNDER WORKS ITEM OS2
- 建議設置之(圓形)污水渠
PROPOSED TWIN RING MAINS UNDER WORKS ITEM OS3
- 建議設置之(圓形)污水渠
PROPOSED TWIN RING MAINS UNDER WORKS ITEM OS4
- 建議設置之抽水站
WORKS ITEM NUMBER

NO.	DATE	GENERAL REVISION	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED
				SIGNED	SIGNED	SIGNED	SIGNED

Contract no. _____

File no. _____

Project no. 4215DS/2A-1T

Contract _____

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PROVISIONAL
SUBJECT TO AMENDMENT

Drawing title
YUEN LONG AND KAM TIN SEWERAGE AND SEWAGE DISPOSAL STAGE 1 & 2 - PACKAGES 2A - 1T
YUEN LONG EFFLUENT PIPELINE PROJECT PROFILE - YUKTSSD SCHEME

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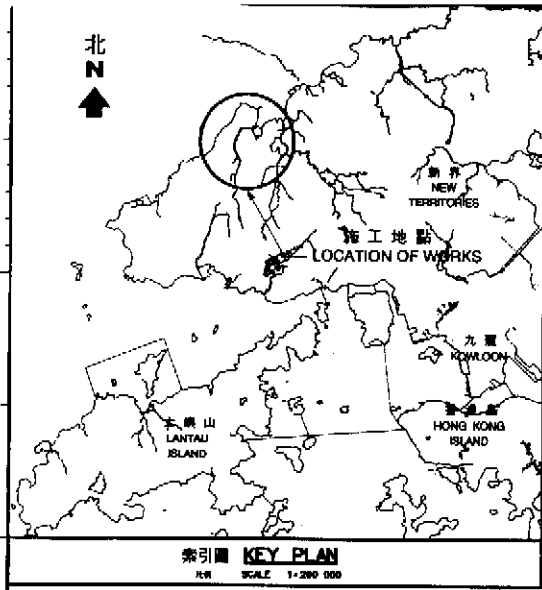
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SEWERAGE PROJECTS DIVISION

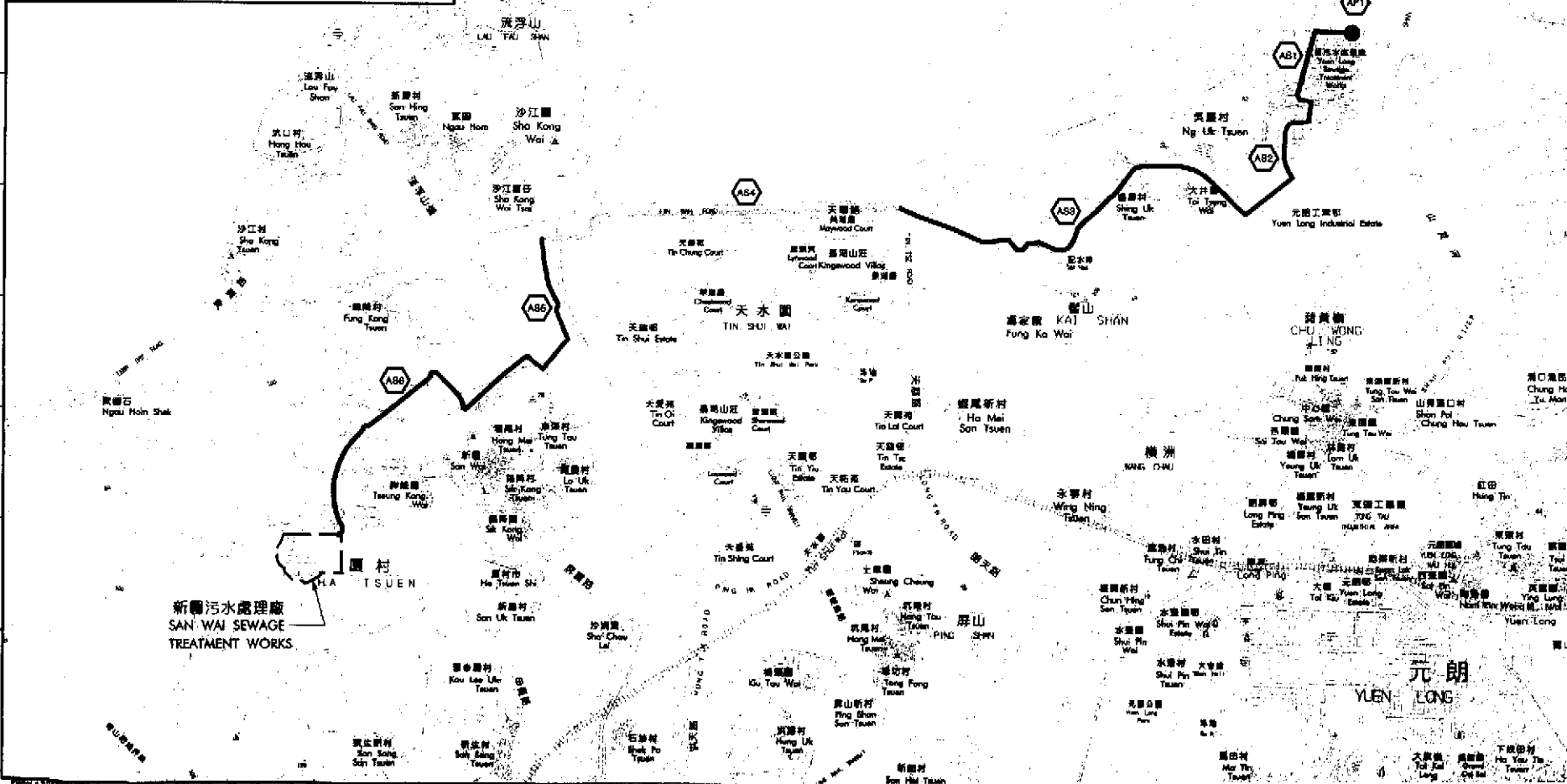
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

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索引圖 KEY PLAN
SCALE 1:250 000



NOTES:

圖例 LEGEND:

- 工區現有埋設之110管線圖則
PROPOSED 110mm RISING MAINS UNDER WORKS ITEM A81
- 工區現有埋設之42管線圖則
PROPOSED 42mm RISING MAINS UNDER WORKS ITEM A82
- 工區現有埋設之150管線圖則
PROPOSED 150mm RISING MAINS UNDER WORKS ITEM A83
- 工區現有埋設之150管線圖則
PROPOSED 150mm RISING MAINS UNDER WORKS ITEM A84
- 工區現有埋設之150管線圖則
PROPOSED 150mm RISING MAINS UNDER WORKS ITEM A85
- 工區現有埋設之150管線圖則
PROPOSED 150mm RISING MAINS UNDER WORKS ITEM A86
- 工區現有埋設之150管線圖則
PROPOSED 150mm RISING MAINS UNDER WORKS ITEM A87
- 工區現有埋設之150管線圖則
PROPOSED 150mm RISING MAINS UNDER WORKS ITEM A88
- 工區現有埋設之150管線圖則
PROPOSED 150mm RISING MAINS UNDER WORKS ITEM A89
- 工區現有埋設之150管線圖則
PROPOSED 150mm RISING MAINS UNDER WORKS ITEM A90
- 工區現有埋設之150管線圖則
PROPOSED 150mm RISING MAINS UNDER WORKS ITEM A91
- 工區現有埋設之150管線圖則
PROPOSED 150mm RISING MAINS UNDER WORKS ITEM A92
- 工區現有埋設之150管線圖則
PROPOSED 150mm RISING MAINS UNDER WORKS ITEM A93
- 工區現有埋設之150管線圖則
PROPOSED 150mm RISING MAINS UNDER WORKS ITEM A94
- 工區現有埋設之150管線圖則
PROPOSED 150mm RISING MAINS UNDER WORKS ITEM A95
- 工區現有埋設之150管線圖則
PROPOSED 150mm RISING MAINS UNDER WORKS ITEM A96
- 工區現有埋設之150管線圖則
PROPOSED 150mm RISING MAINS UNDER WORKS ITEM A97
- 工區現有埋設之150管線圖則
PROPOSED 150mm RISING MAINS UNDER WORKS ITEM A98
- 工區現有埋設之150管線圖則
PROPOSED 150mm RISING MAINS UNDER WORKS ITEM A99
- 工區現有埋設之150管線圖則
PROPOSED 150mm RISING MAINS UNDER WORKS ITEM A100

A	DATE	GENERAL REVISION	BY	DATE

REVISION	DATE	BY	DATE
Design	SIGNED	K. G. YAM	FEB. 91
Drawn	SIGNED	W. Y. NG	FEB. 91
Traced			
Checked	SIGNED	Y. L. CHAN	FEB. 91
Approved			

Chief Engineer: _____ Date: _____

Contract no: _____

File no: _____

Project no: 4215DS/2A-1T

Contractor: _____

REDUCED COPY

PROVISIONAL
SUBJECT TO AMENDMENT

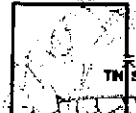
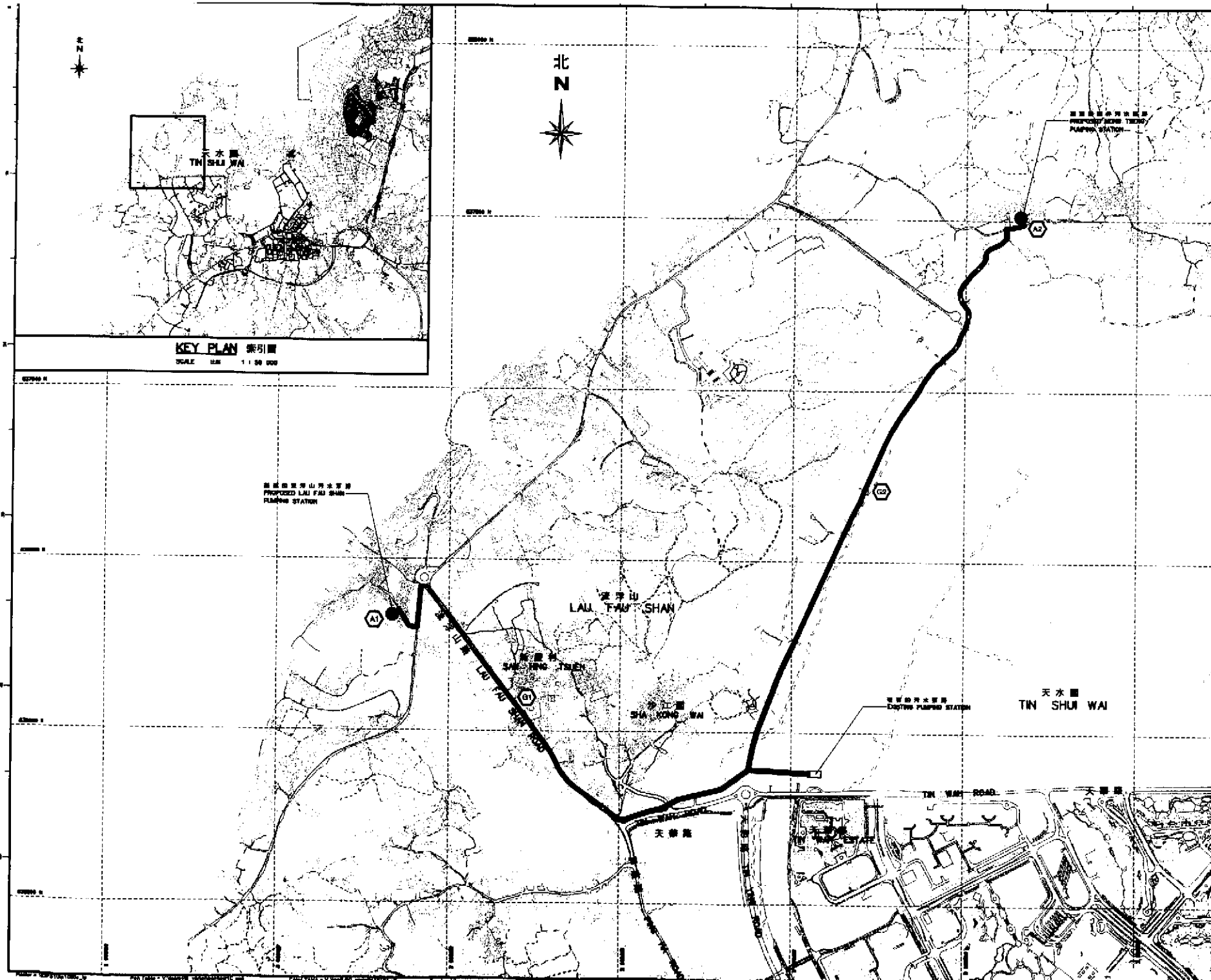
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YUEN LONG AND KAM TIN SEWERAGE AND SEWAGE DISPOSAL STAGE 1 & 2 - PACKAGE 2A - 1T YUEN LONG EFFLUENT PIPELINE PROJECT PROFILE - ALTERNATIVE SCHEME

Drawing no	Scale
DDN / 215DS / 4820A	1:10 000 OR AS SHOWN

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Office: **SEWERAGE PROJECTS DIVISION**

DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION



KEY PLAN 索引圖
SCALE 1:50,000

NOTES:

- 圖例 LEGEND:
- 擬議的污水渠 PROPOSED SEWER
 - 擬議的雨水渠 PROPOSED TRUNK RAINING MAIN
 - ⬡ 工程項目編號 WORKS ITEM NUMBER
 - 擬議的抽水廠 PROPOSED PUMPING STATION

No.	date	description	initials
REVISION			
		name	date
designed			
drawn	SIGNED	P. S. LAM	18.2.01
traced			
checked	SIGNED	W. T. AU	03.01
approved			

Chief Engineer _____ Date _____

contract no. _____

site no. _____

project no. 215DS / 2A3T

contract **REDUCED COPY**

PROVISIONAL
SUBJECT TO AMENDMENT

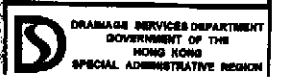
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SEWERAGE AND SEWAGE DISPOSAL
PACKAGE 2A3T -
LAU FAU SHAN / MONG TSENG
TRUNK SEWER
PROJECT PROFILE

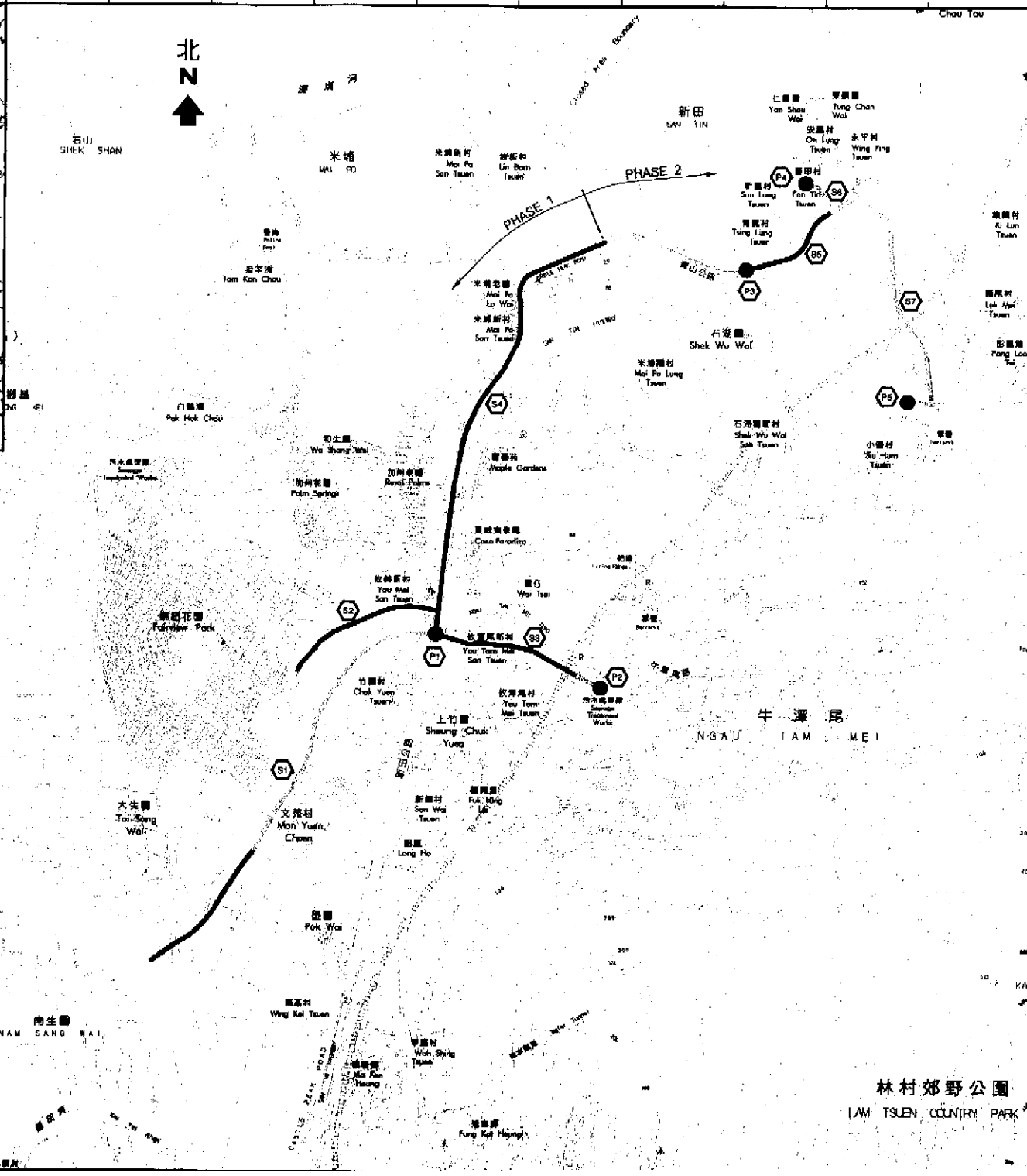
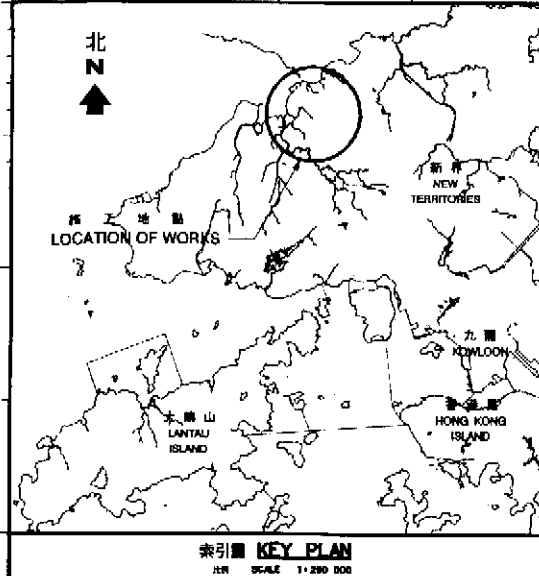
drawing no. DDN / 215DS / 6807

scale 1:5000
OR
AS SHOWN

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NOTES:

圖例 LEGEND:

- PROPOSED GRAVITY SEWER
- PROPOSED RISING MAIN
- PROPOSED PUMPING STATION
- WORKS ITEM NUMBER

C	07/01	GENERAL REVISION	REVISED
B	06/01	GENERAL REVISION	REVISED
A	05/01	GENERAL REVISION	REVISED
No.	date	description	initial

REVISION

assigned	checked	date
SIGNED W. M. LEE	SIGNED W. Y. HO	FEB. 01
SIGNED W. M. LEE	SIGNED W. M. LEE	FEB. 01

Chief Engineer _____ Date _____

contract no. _____

file no. _____

project no. 215 DS

contract _____

PROVISIONAL
SUBJECT TO AMENDMENT

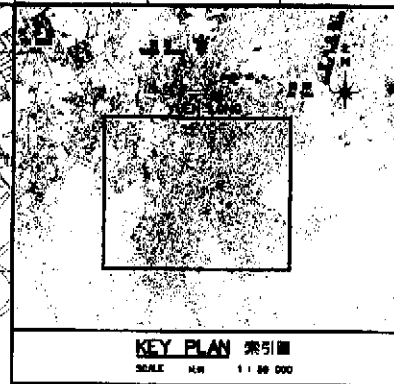
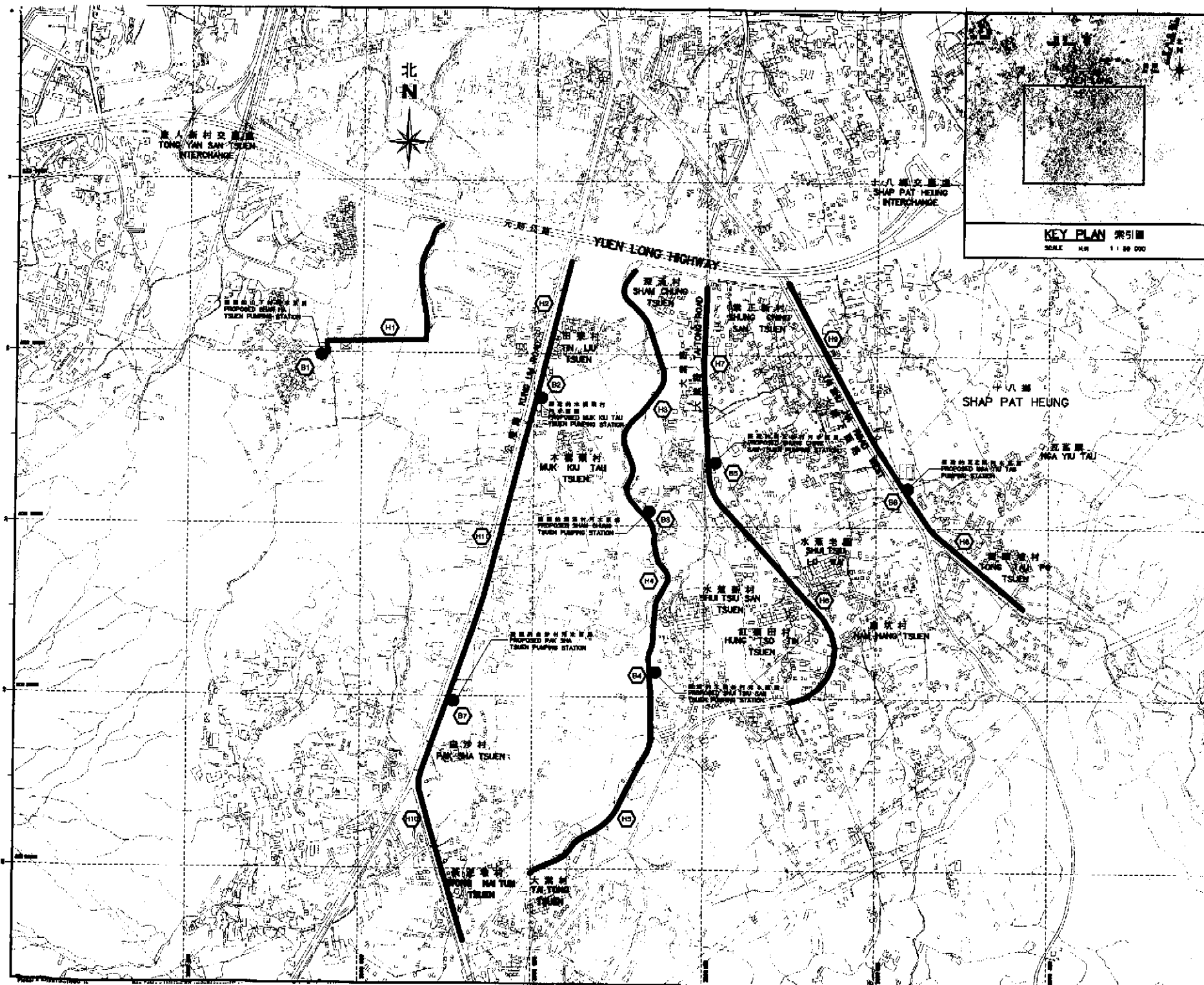
drawing title
YUEN LONG AND KAM TIN SEWERAGE AND SEWAGE DISPOSAL PACKAGES 2A-2T & 2B-1T - NGAU TAM MEI / SAN TIN TRUNK SEWERAGE, PHASE 1 & 2 PROJECT PROFILE

drawing no. DDN / 215DS / 7801 C	scale 1 : 10 000 OR AS SHOWN
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GOVERNMENT OF THE HONG KONG
SPECIAL ADMINISTRATIVE REGION



NOTES:

- 圖例
LEGEND:
- 擬議的污水管
PROPOSED GRAVITY SEWER
 - 擬議的雨水管
PROPOSED RAIN WATER MAIN
 - 上流項目編號
WORKS ITEM NUMBER
 - 擬議的抽水站
PROPOSED PUMP-OUT STATION

A	DR.01	GENERAL REVISION	SKIPPED
NO.	DATE	DESCRIPTION	DATE
REVISION			
		NAME	DATE
DESIGNED	SKIPPED	P. N. CHAN	MAR. 01
DRAWN	SKIPPED	M. I. SO	16.2.01
TRACED			
CHECKED	SKIPPED	W. T. AU	3.01
APPROVED			

Contract no. _____
 File no. _____
 Project no. 4215DS / ZB - 2T
 Contract _____

REDUCED COPY
PROVISIONAL
 SUBJECT TO AMENDMENT

Drawing title
 YUEN LONG & KAM TIN SEWERAGE
 AND SEWAGE DISPOSAL
 PACKAGE 2B2T -
 YUEN LONG SOUTH BRANCH SEWERS
 PROJECT PROFILE

Drawing no. DDN / 215DS / 8808A
 Scale 1 : 5000
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