Project Profile

for

Tai Po Tai Wo Road Sewage Pumping Station

under

PWP Item 4237DS –
Tai Po Tai Wo Road Sewage Pumping Station and Rising Mains

Drainage Services Department
The Government of the Hong Kong Special Administrative Region

November 2007

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1. Basic Information

1.1 Project Title

This Project Profile is prepared for the "Tai Po Tai Wo Road Sewage Pumping Station" (hereinafter referred to as the "Project").

1.2 Purpose and Nature of Project

The Project is part of "Public Works Programme Item 4237DS - Tai Po Tai Wo Road Sewage Pumping Station and Rising Mains", which originates from the findings of the Study "Review of North District and Tolo Harbour Sewerage Master Plan" completed by the Environmental Protection Department in November 2002. The proposed pumping station is an essential facility in the extension of the public sewerage network in Tai Po to cover the Lam Tsuen Valley and Hong Lok Yuen areas. A plan showing the scope of works of PWP Item 4237DS is given in Drawing No.DDN/237DS1/0001E (Appendix A).

1.3 Name of the Project Proponent

Drainage Services Department is the works department and Environmental Protection Department is the client department.

1.4 Location and Scale of Project

The proposed pumping station is situated next to the existing Shui Wai Vacuum Pumping Station at Tai Po Tau Shui Wai, Tai Po. The location of the Project site and the layout of the proposed pumping station are shown in Drawing No. DDN/237DS1/8112A, 8072B, 8073C & 8097B (Appendix A). The design peak flow of the proposed pumping station is about 420 l/s (equivalent to an average dry weather flow of 12,100m^3/day).

Owing to land constraints, an existing Refuse Collection Point (RCP) and Refuse Collection Vehicle Lay-by (RCV) of the Food and Environmental Hygiene Department (FEHD) will need to be relocated as shown in Drawing No. DDN/237DS1/8072B (Appendix A). There is no demolition of existing transformer room, diesel generator or fuel tank room in the Project.

1.5 Rationale of Site Selection

The Project site is within Government land categorized as "Village Type Development" ("V") Zone on Tai Po Outline Zoning Plan No. S/TP/19. This proposed site is considered the most suitable site based on land, engineering and environmental considerations. Furthermore, the site is situated next to the existing Shui Wai Vacuum Pumping Station at Tai Po Tau Shui Wai, thus allowing optimization of utility of the land concerned. Application for planning permission under S16 of the Town Planning Ordinance has been submitted to the Town Planning Board.

1.6 *Number and Types of Designated Project*

The installed capacity (average dry weather flow) of the proposed pumping station is 12,100m^3/day and the nearest residential area (Tai Po Tau Shui Wai village) is at 12m away from the boundary of the project. As such, the Project constitutes a Designated Project under Item F.3(b)(i), Part 1 of Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO) (i.e. a sewage pumping station with an installed capacity of more than 2,000m^3 per day and a boundary of which is less than 150m from an existing or planned residential area).

1.7 *Name and Telephone Number of Contact Person*

Ir S C LAU
Engineer, Sewerage Projects Division, Drainage Services Department
Tel. No.: 2594 7454
Fax. No.: 2827 8700

2. Outline of Planning and Implementation Programme

The Sewerage Projects Division and the Electrical & Mechanical Projects Division of the Drainage Services Department will carry out the design and construction supervision of the Project. The Buildings/ Civil Maintenance Team, Sewage Treatment 1 Division and Mainland North Division of the Drainage Services Department will operate and maintain the completed works.

Planning and design of the proposed works has been in process since February 2006. Construction is scheduled for June 2008 for completion by June 2011.

There are no major projects in the vicinity of the Project with overlapping implementation programme that will cause significant environmental impacts due to cumulative effects.

3. Possible Impacts on the Environment

3.1 *Possible Environmental Impacts During Construction Stage of the Pumping Station*

(a) Dust

Dust may be generated from construction activities such as earthworks, excavation, construction of concrete structures and demolition of an existing boundary wall.

(b) Water Quality

Potential impacts may arise from surface runoff and erosion of exposed soil, earthworks and stockpiles during storm events. Muddy water may also be generated from the construction activities such as dust suppression sprays, dewatering during excavation and washing of construction equipment.

(c) Noise

Noise may be generated from construction activities such as concreting and excavation works. The equipment and plant likely to be used on site might involve air compressors, generators, hydraulic or pneumatic breakers, backhoes and other excavation plant. A detailed noise impact assessment is attached in Appendix B.

(d) Waste

Construction and demolition (C&D) material and waste such as excavated spoil (soil and rock), unusable concrete and grout, wood, metal scraps, equipment parts and packaging materials will be generated.

(e) Landscape and Visual

The site of the proposed pumping station is largely a vacant Government site with a small part being occupied by an existing RCP and RCV. A number of existing trees identified in the vicinity of the site will be affected. The location and conditions of the site and the existing trees are shown in Drawing No. DDN/237DS1/8112A & 8074A with photos (Appendix A & C). In addition, potential landscape and visual impacts during the construction stage may arise from the construction plant and materials and site traffic.

(f) Ecology

Construction of the Project does not involve any reclamation or dredging activities. No impacts on ecology are expected during the construction stage.

(g) Traffic

The Project does not involve excavation works on public roads. A small amount of traffic will be generated by the construction of the pumping station and the impact on traffic in the area will be minimal.

Apart from construction traffic, a small portion of the existing car park next to the proposed pumping station will need to be temporarily occupied during construction stage to provide working space for the proposed pumping station.

(h) Cultural Heritage

No impacts on historical monuments or buildings are expected during the construction stage.

3.2 Possible Environmental Impacts During Operation Stage of the Pumping Station

(a) Odour

The inlet chamber and wet well of the pumping station have the potential to become the sources of odour nuisance.

(b) Water Quality

The Project will not cause any adverse water quality impact during normal operating conditions. In fact, implementation of the Project would enhance the water quality of the environment in Tai Po area. Only in exceptional emergency situations, such as prolonged power failure, will potential water quality impacts arise due to sewage bypass into the nearby stormwater drainage system discharging into Lam Tsuen River and Tolo Harbour (see Drawing No.DDN/237DS1/8075A (Appendix D)).

(c) Noise

Mechanical screens, pumps and extraction fans of deodourizers are potential noise sources during operation of the proposed pumping station if no mitigation measures are incorporated into the design of the pumping station. A detailed noise impact assessment is attached in Appendix B.

(d) Waste

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

(e) Landscape and Visual

A number of existing trees will be affected by the Project. No major visual impact is expected to arise from the Project owing to the modest size of the pumping station and the incorporation of landscape and aesthetics considerations in the design.

(f) Ecology

No impacts on ecology are expected during the operation stage.

(g) Traffic

The proposed pumping station will be accessible via the vehicular access of the existing pumping station from Tai Po Road. The delivery of materials and removal of screenings will be infrequent and will not have significant impacts on traffic flow in the area.

(h) Cultural Heritage

No impacts on historical monuments or buildings are expected during the operation stage.

4. Major Elements of the Surrounding Environment

This section outlines the existing and planned sensitive receivers that might be affected by the Project. It also describes the major elements of the surrounding environment that may be affected by the Project.

4.1 Existing Sensitive Receivers and Sensitive Parts of the Natural Environment

The locations of the existing sensitive receivers are shown in Appendix E.

(a) Residential Developments

There are six residential developments near the boundary of the Project, namely (i) Tai Po Tau Shui Wai (SR1) which is located at 12m away on the southwestern side; (ii) Parc Versailles (SR 2) which is located at 140m away westwards and screened by SR1; (iii) Tai Po Tau Village (SR4) which is located at 115m away northwestwards and screened by the KCRC rail track; (iv) Serenity Park (SR7) which is located at 210m away northeastwards and screened by KCRC rail track; (v) Po Nga Court (SR10) which is located at 165m away southeastwards and screened by Tai Po Tai Wo Road.

(b) Educational Institutions

There are one secondary school and two primary schools in the vicinity of the Project, namely Kai Chi School (SR3) which is located at 110m away northwestwards and screened by the KCRC rail track; Tai Po Sam Yuk Secondary School (SR6) which is located at 160m away northeastwards and screened by the KCRC rail track; Tai Po Government Primary School (SR8) which is located at 190m away eastwards and screened by KCRC rail track.

(c) Industrial Buildings

There is an offtake station of Town Gas – Tai Po West Offtake Station (SR11) which is located at 35m away eastwards from the boundary of the Project. In addition, the Housing Department Building Maintenance Division Contractor Depot (SR9) is located at 130m away eastwards and screened by Tai Po Tai Wo Road.

(d) Recreational Facilities

There is a playground – Tai Po Tau Playground (SR5) which is located at 85m away northeastwards and screened by the KCRC rail track.

4.2 Planned Sensitive Receivers and Sensitive Parts of the Natural Environment

There is no rezoning proposal and/or Section 16 planning application under the Town Planning Ordinance in the vicinity of the Project site that would become planned sensitive receivers.

4.3 Major Elements of the Surrounding Environment Affecting the Project

The Project will not be affected by the surrounding environment.

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

5.1 During Construction Stage of the Pumping Station

(a) Dust

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

(b) Water Quality

The construction activities in the Project will include excavation, earthworks and general concrete building works. The contractor will be required to provide, where necessary, silt removal facilities so as to remove any silt before discharge of site runoff into the nearby stormwater drains. The mitigation measures will be provided prior to the commencement of excavation. The design of temporary on-site drainage and silt removal facilities will follow the guidelines stipulated in EPD's Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN 1/94). With the adoption of such mitigation measures, no adverse impacts on water quality are expected in the course of construction.

(c) Noise

Common construction plants including backhoe, concrete mixer, vibratory poker, pneumatic breaker and the like will be used. Temporary hoardings will be erected during construction of the pumping station to screen the noise. The Contractor has to comply with the relevant regulations and the Noise Control Ordinance to limit the construction noise within acceptable limits during the construction stage. Construction activities will be carried out in the daytime (8:00 – 19:00) and construction activities on Sundays and public holidays will be avoided. A quantitative noise assessment is provided in Appendix B. The use of quiet construction equipment, noise barrier on the southern side of the pumping station and good site practice will be implemented to mitigate any noise nuisance. Noise from the daytime construction works will comply with the relevant noise limit of 75dB(A) Leq(30 minutes) for domestic premises specified in the Technical memorandum on Environmental Impact Assessment Process (EIAO-TM). A Construction Noise Permit under the Noise Control Ordinance will be acquired beforehand in case construction works have to be carried out during nighttime(19:00 – 07:00), Sundays and public holidays.

(d) Waste

The Contractor will be required to sort all C&D material and waste into different categories for disposal at public filling, landfill, or recycling as appropriate. The C&D material to be generated is about 8,000 m^3 and about half of it can be reused on site. The rest (i.e. 4,000 m^3) will be disposed of to the designated Public Filling Facility at Tuen Mun Area 38 Fill Bank. No chemical waste generation is identified under the Project.

(e) Landscape and Visual

The trees in the vicinity of the Project site are of common species and no endangered tree species have been identified. Tree protection measures and transplanting will be adopted as far as practicable to prevent damage to the existing trees during the construction phase. Proposed measures for preservation and protection of existing trees are given in Appendix C. Proposals for tree felling, should this be necessary, will be submitted to District Land Office/Tai Po for approval.

To avoid visual impacts, surplus C&D materials will be required to be removed off site promptly. In addition, site hoardings will be erected around the site area to minimize potential impacts to the residents and pedestrians nearby.

5.2 During Operation Stage of the Pumping Station

(a) Odour

To minimize potential odour problems, the inlet chamber, screen chamber, wet well, etc will be located underground with cover, and enclosed by a reinforced concrete superstructure. In addition, a deodourizer with forced ventilation will be installed to remove the odour. As have been adopted in other similar pumping stations, e.g. Nam San Wai Sewage Pumping Station and Ting Kok Road Pumping Station No.5, the deodorizer will provide an overall H_2S removal efficiency of 99.5% or higher. In addition, air charge from the deodourizer will be located in a direction away from the sensitive receivers, i.e. on the northern and eastern sides of the pumping station.

(b) Water Quality

To minimize potential impacts on water quality arising from bypass of sewage (as shown in Appendix D), one standby pump and one standby mechanical screen will be provided in addition to the two duty pumps and the duty mechanical screen. On top of this, to cater for breakdown or maintenance of the duty pumps and mechanical screens, about 1-hour emergency storage will also be provided. In order to minimize the risk of power failure, dual power supply system in the form of both a standby transformer and a ring power supply will be provided by the CLP. In addition, a telemetry system will be provided to alert operators of any irregularities or operation problems of the pumping station, such that immediate actions can be taken in case of

emergency. With 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 impacts from operation of the pumping station, all the pumps will be enclosed inside the pumping station building. Acoustic filters will be installed at the extraction fans of the de-odourizer. The extraction fans will be located at positions with minimum disturbance to the nearby sensitive receivers, i.e. on the northern and eastern sides of the pumping station. According to the quantitative assessment attached in Appendix B, with the above measures implemented, adverse noise impacts are not anticipated.

(d) Waste

The screenings collected by the screens of the pumping station will be enclosed in storage containers. The operation will be conducted inside the pumping station building. The screenings would then be trucked to designated landfill sites for disposal. Therefore, it is anticipated that no adverse waste impacts will arise.

(e) Landscape and Visual

Landscape and aesthetics are major considerations in the design of the pumping station. Trees, shrubs and groundcovers will be planted along the periphery of the pumping station. To further enhance the landscape of the Project, a green roof (i.e. planting on the roof of the pumping station) will be incorporated in the pumping station design.

Architectural details including form, colour scheme and types of external finish of the pumping station will be carefully designed to achieve a harmonious outlook. The structure will be restricted to 1 storey (not greater than 7m in height). In addition to this, the external facades of the adjacent existing Shui Wai Vacuum Sewage Pumping Station will be refurbished to blend with those of the proposed pumping station and the surroundings. Installation of solar panels on the roof will also be considered as an energy efficiency measure of the Project.

Elevations and a plan showing the conceptual design of the appearance of the proposed pumping station and existing pumping station is shown in Appendix F. The building aesthetics design will be submitted to ArchSD for vetting in accordance with ETWB Technical Circular No. 8/2005.

With the implementation of the above measures, no significant adverse landscape and visual impacts are anticipated during the operation stage of the pumping station.

5.3 Summary of Potential Environmental Impacts and Mitigation Measures

The potential environmental impacts and proposed mitigation measures to be incorporated into the design and construction of the Tai Po Tai Wo Road Sewage Pumping Station are summarized in Table 1:

Table 1

Project Stage	**Potential Environmental Impact**	**Mitigation Measures**	**Relevant Section in the Project Profile**
Construction	Minor dust nuisance	(1) Proper working method will be adopted and wheel-washing facilities will be provided. (2) Control by contract specifications.	5.1 (a)
	Water quality impact	(1) Control of construction surface run-off by EPD's Practice Note for Professional Persons, Construction Site Drainage-ProPECC PN 1/94. (2) Control by contract specifications.	5.1 (b)
	Noise impact	(1) Temporary noise barriers and site hoarding will be erected. (2) Construction activities will be carried out in daytime. (3) Compliance with relevant regulations and Noise Control Ordinance. (4) Use of quiet construction plant. (5) Control by contract specifications.	5.1 (c)
	Minor waste impact	(1) C&D material and waste will be sorted on site. (2) C&D material will be disposed of to designated public fill facility at Tuen Mun Area 38 Fill Bank. (3) Control by contract specifications.	5.1 (d)
	Landscape and visual impact	(1) Site hoarding will be erected. (2) Control by contract specifications.	5.1 (e)
Operation	Odour nuisance	(1) All odour sources will be enclosed. (2) De-odourizer will be installed to remove odour.	5.2 (a)

	Water quality impact	No adverse impact during normal operation. Measures to minimize abnormal situations and the possibility of sewage bypass to Tolo Harbour: (1) Standby pump and mechanical screen will be provided. (2) Emergency storage capacity will be provided. (3) Back-up power supply will be provided. (4) Telemetry system will be provided to immediately alert operators of any irregularities or operation problems.	5.2 (b)
	Noise impact	(1) Pumps will be enclosed. (2) Acoustic filters will be installed to reduce noise level of extraction fans.	5.2 (c)
	Waste generation	(1) Screenings will be enclosed. (2) Waste will be properly disposed of to designated landfill facility.	5.2 (d)
	Landscape and visual impact	(1) Planting works along the periphery of the pumping station will be implemented. (2) A green roof will be incorporated. (3) Architectural details of the pumping station, including form, colour scheme and external finishes will be carefully designed taking into account the surrounding features and buildings. (4) The facades of the existing Shui Wai Vacuum Pumping Station will be refurbished aesthetically. (5) The structure will be restricted to one storey.	5.2 (e)

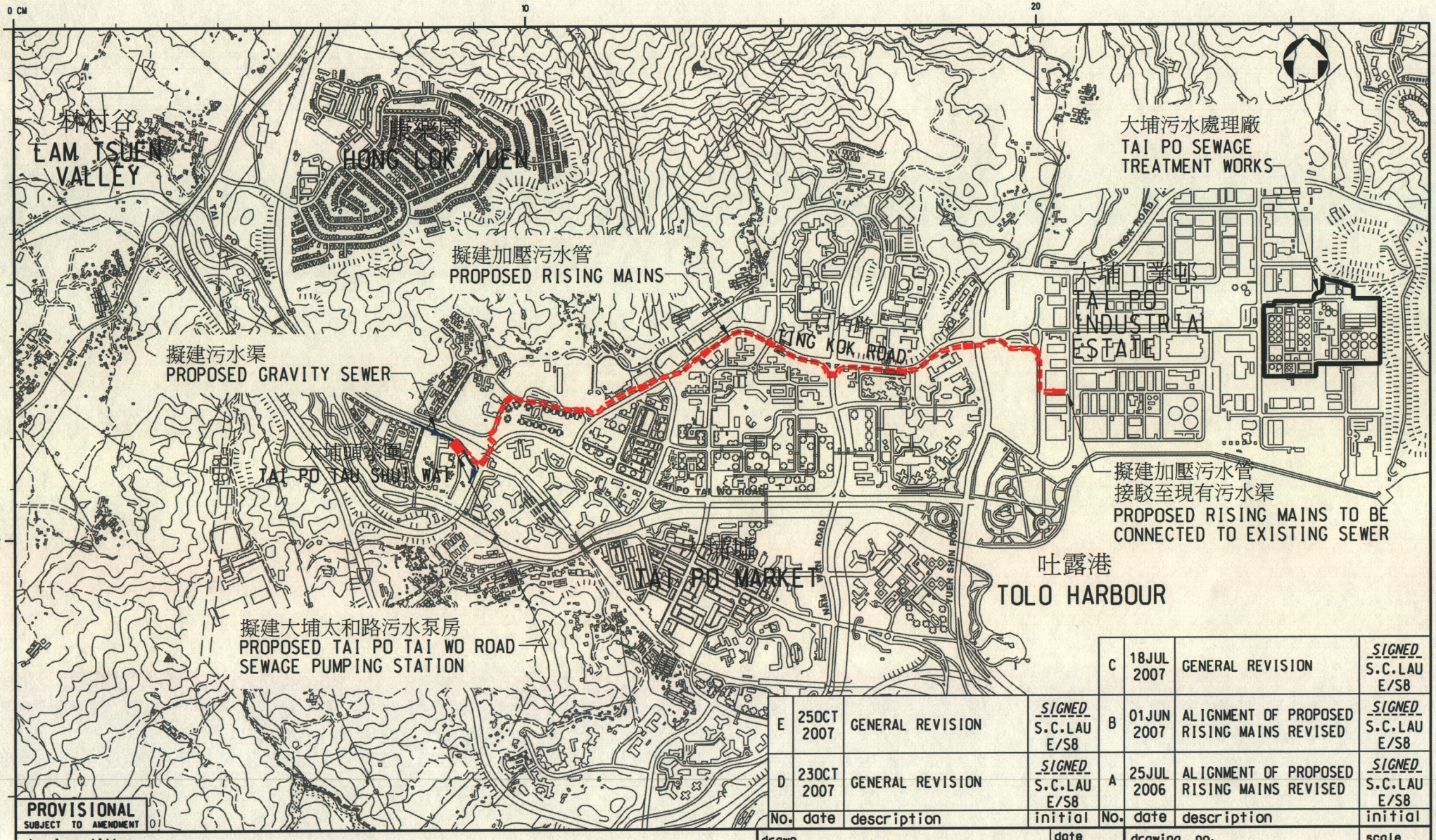
With the above-mentioned mitigation measures incorporated into the design and construction of the Project, the proposed Tai Po Tai Wo Road Sewage Pumping Station would not cause significant impacts on the environment. In conclusion, the above preventive and mitigation measures are considered sufficient to mitigate the possible environmental impacts that may arise from the Project.

END

Project Profile

for Tai Po Tai Wo Road Sewage Pumping Station

APPENDIX A – LAYOUT AND GENERAL ARRANGEMENT OF PUMPING STATION



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D	23OCT 2007	GENERAL REVISION	SIGNED S.C.LAU E/S8
C	18JUL 2007	GENERAL REVISION	SIGNED S.C.LAU E/S8
B	01JUN 2007	ALIGNMENT OF PROPOSED RISING MAINS REVISED	SIGNED S.C.LAU E/S8
A	25JUL 2006	ALIGNMENT OF PROPOSED RISING MAINS REVISED	SIGNED S.C.LAU E/S8

drawing title

工務計劃項目第 4237DS 號 -
大埔太和路污水泵房及加壓污水管

PWP ITEM No. 4237DS-
TAI PO TAI WO ROAD SEWAGE PUMPING STATION AND RISING MAINS

drawn	SIGNED W. K. TAM	date 05JUN2006
checked	SIGNED S. C. LAU	date 05JUN2006
approved	SIGNED H. S. KAN	date 05JUN2006
office	SEWERAGE PROJECTS DIVISION	

drawing no. DDN/237DS1/0001E

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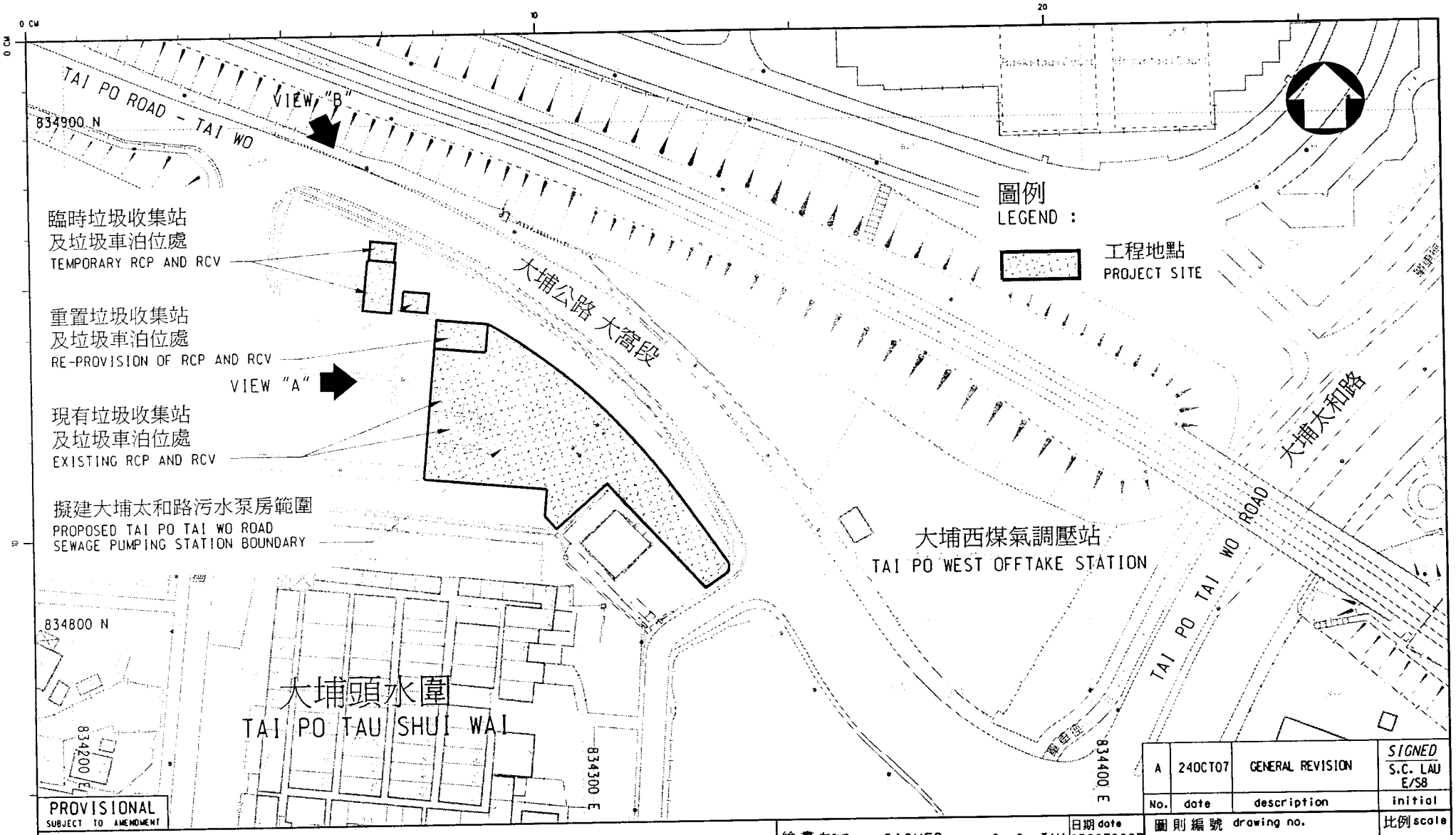

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No.	date	description	initial
A	24OCT07	GENERAL REVISION	SIGNED S.C. LAU E/S8

圖則名稱 drawing title

大埔太和路污水泵房 -
TAI PO TAI WO ROAD SEWAGE PUMPING STATION -
工程地點
PROJECT SITE

繪畫 drawn	SIGNED	S. C. TAM	日期 date 23OCT2007
核對 checked	SIGNED	Ir S. C. LAU	日期 date 23OCT2007
批核 approved	SIGNED	Ir H. S. KAN	日期 date 23OCT2007
部門 office	污水工程部 SEWERAGE PROJECTS DIVISION		

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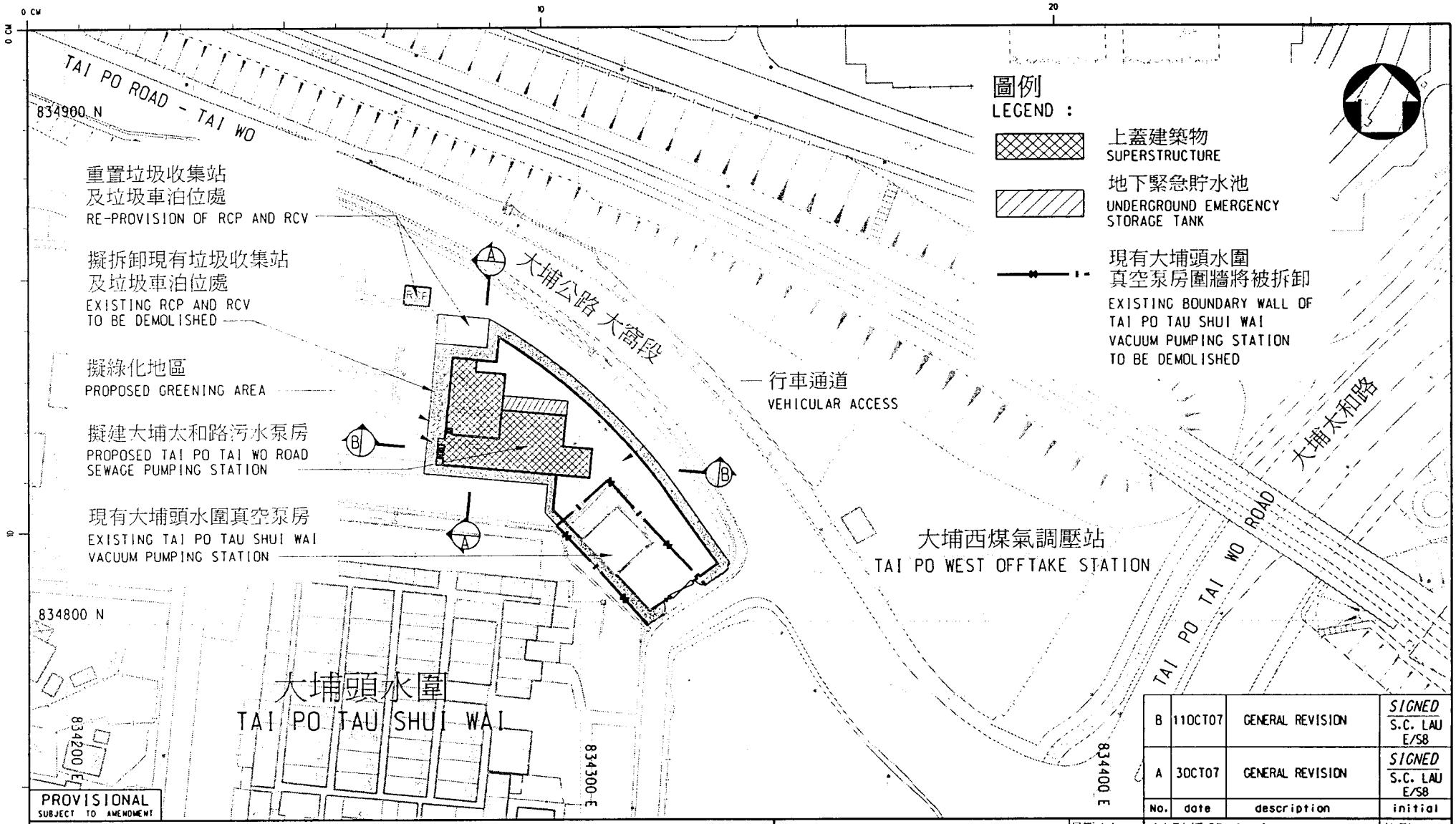
VIEW "A"



VIEW "B"

Existing Site Environment near Proposed Tai Wo Road Sewage Pumping Station



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No.	date	description	initial
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A	3OCT07	GENERAL REVISION	SIGNED S.C. LAU E/S8

圖則名稱 drawing title

大埔太和路污水泵房
TAI PO TAI WO ROAD SEWAGE PUMPING STATION
(圖一)
(SHEET 1 OF 3)

繪畫 drawn	SIGNED	K. W. FONG	日期 date 27SEP2007
核對 checked	SIGNED	Ir S. C. LAU	日期 date 27SEP2007
批核 approved	SIGNED	Ir H. S. KAN	日期 date 27SEP2007
部門 office	污水工程部 SEWERAGE PROJECTS DIVISION		

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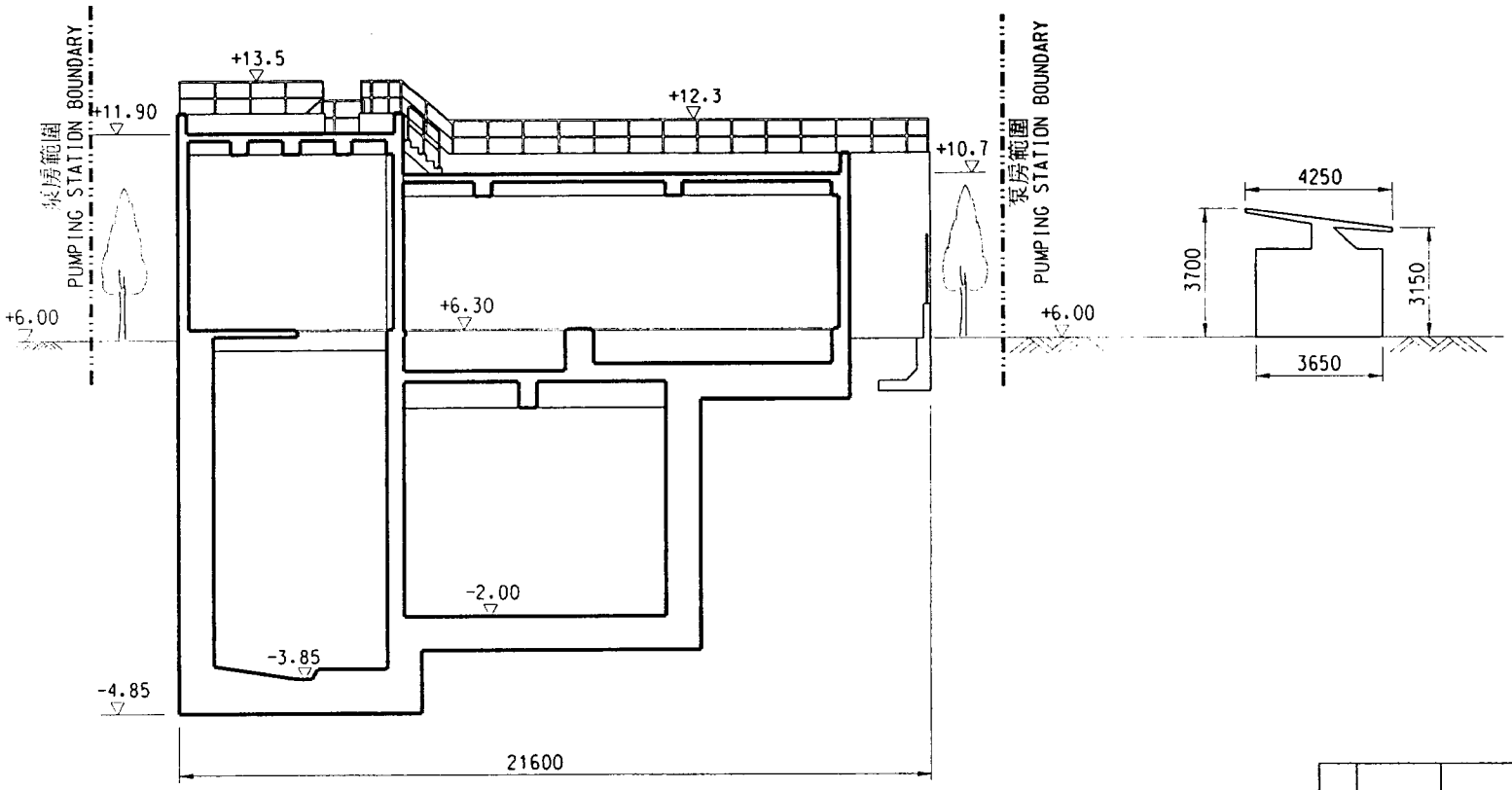

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SECTION A - A

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B	5OCT07	GENERAL REVISION	*SIGNED* S.C. LAU E/S8
A	3OCT07	GENERAL REVISION	*SIGNED* S.C. LAU E/S8

PROVISIONAL
SUBJECT TO AMENDMENT

圖則名稱 drawing title

大埔太和路污水泵房
TAI PO TAI WO ROAD SEWAGE PUMPING STATION
(圖二)
(SHEET 2 OF 3)

繪畫 drawn	*SIGNED*	K. W. FONG	日期 date 11MAY2007
核對 checked	*SIGNED*	Ir S. C. LAU	日期 date 11MAY2007
批核 approved	*SIGNED*	Ir H. S. KAN	日期 date 11MAY2007
部門 office	污水工程部 SEWERAGE PROJECTS DIVISION		

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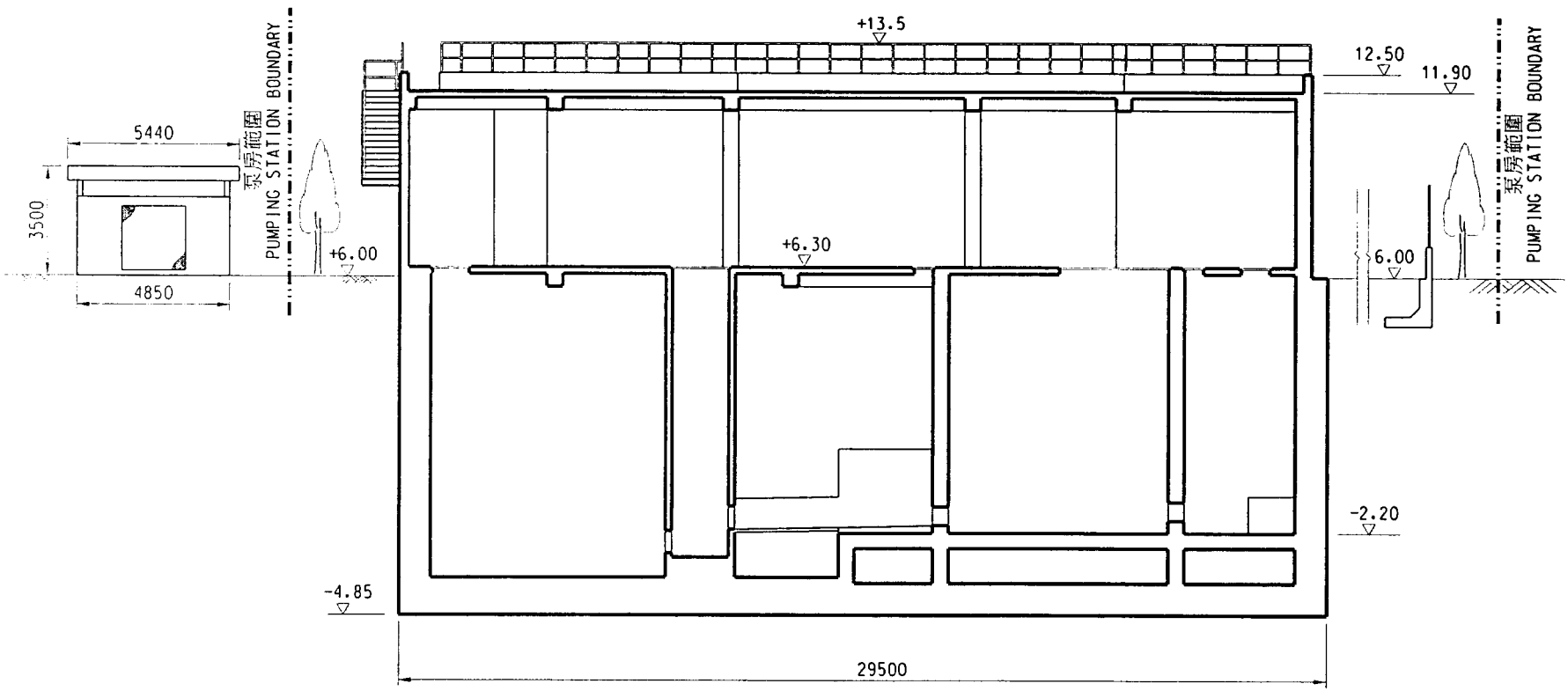

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SECTION B - B

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A	5OCT07	GENERAL REVISION	*SIGNED* S.C. LAU E/S8

PROVISIONAL
SUBJECT TO AMENDMENT

圖則名稱 drawing title

大埔太和路污水泵房

TAI PO TAI WO ROAD SEWAGE PUMPING STATION

(圖三)
(SHEET 3 OF 3)

繪畫 drawn	*SIGNED*	S. C. TAM	日期 date 30CT2007
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部門 office	污水工程部 SEWERAGE PROJECTS DIVISION		

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比例 scale 1:200

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DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

Project Profile

for Tai Po Tai Wo Road Sewage Pumping Station

APPENDIX B – DETAILED NOISE IMPACT ASSESSMENT

Project Profile
for Tai Po Tai Wo Road Sewage Pumping Station

Noise Impact Assessment

Introduction

The following Technical Memoranda (TM) under the Noise Control Ordinance (NCO) and Environmental Impact Assessment Ordinance (EIAO) should be complied with in the noise impact assessment:

- Technical Memorandum on Noise from Construction Work other than Percussive Piling (TM-CW) under the NCO;
- Technical Memorandum on Noise from Places other than Domestic Premises; Public Places or Construction Sites (TM-IND) under the NCO;
- TM-EIAO.

Noise Assessment Procedure

The Noise Sensitive Receivers (NSRs) identified in the Project include Tai Po Tau Shui Wai, Parc Versailles, Kai Chi School, Tai Po Tau, Tai Po Sam Yuk Secondary School, Serenity Park, Tai Po Government Primary School and Po Nga Court. The nearest noise sensitive receivers and their distances from the construction works, the proposed pumping station and the existing vacuum pumping station are given as follows:

Identified Nearest NSRs

NSR ID	Land use	Description	Slant Distance (m) from		
			Anticipated Construction Works	Proposed Pumping Station	Existing Vacuum Pumping Station
SR1a	Residential	80A, Tai Po Tau Shui Wai	15	31	16
SR1b	Residential	60, Tai Po Tau Shui Wai	21	29	25
SR3	School	Kai Chi School	132	128	159

Construction Phase

Construction noise impacts were assessed in accordance with TM-CW. Since only day time works are anticipated, the noise criteria adopted are 75 dB(A) for residential uses and 70dB(A) {65 dB(A)} for educational uses {examination}, based on the TM-EIAO. In case that construction activities should be undertaken in restricted hours (1900 – 0700 and any time on a general holiday including Sunday), the contractor is required to obtain a Construction Noise Permit (CNP) from the Noise Control Authority, in order to comply with the NCO.

The Powered Mechanical Equipment (PME) to be used and their assumed sound power levels (SWLs) during various construction activities including site clearance, excavation works, concreting works and miscellaneous works are listed below. The SWLs of the equipment were taken from Table 3 of the TM-CW and BS5228 Part 1: 1997. Usage of quiet equipment has been included in the assessments.

Powered Mechanical Equipment (PME) used in Construction Phase

Site Clearance

PME	Reference*	No. of Items	SWL/Item, dB(A)
Breaker, hand-held <20 Kg	CNP024	1	108
Excavator	C3/97	1	105
Dump Truck	C9/19	1	102
Air compressor	CNP003	1	104
Generator	C7/45	1	95

Excavation Works

(PME)	Reference*	No. of Items	SWL/Item, dB(A)
Dump truck	C9/19	1	102
Excavator	C3/97	1	105
Generator	C7/45	1	95
Air compressor	CNP003	1	104

Concreting Works

(PME)	Reference*	No. of Items	SWL/Item, dB(A)
Mobile Crane	C7/114	1	101
Concrete Lorry Mixer	C6/23	1	100
Concrete pump	C6/36	1	106
Poker (Power Rating limited to 2kW)	C6/32	3	100
Generator	C7/45	1	95
Air compressor	CNP003	1	104

Miscellaneous Works

(PME)	Reference*	No. of Items	SWL/Item, dB(A)
Lorry	C3/59	1	105
Compactor	CNP050	1	105
Generator	C7/45	1	95
Air compressor	CNP003	1	104
Roller	C8/25	1	96

* CNPxxx – Table 3 of TM-CW

Cx/xxx – BS5228 Part1: 1997

Operation Phase

Operational noise impacts were assessed in accordance with the TM-IND. The NSRs are located in a low density residential area with low-rise (e.g. Tai Po Tau Shui Wai and Parc Versailles) and high-rise developments (e.g. Po Nga Court). The Area Sensitivity Rating (ASR) is assessed as "A" because the concerned road section of Tai Po Road - Tai Wo, Tai Po Tai Wo Road (with respect to their AADT flow) and the KCRC railway cannot be warranted as the influencing factors in accordance with the relevant TM-IND. The Acceptable Noise Levels (ANLs) are therefore 60 dB(A) and 50 dB(A) in the time periods of 0700 – 2300 and 2300 – 0700 respectively. Furthermore, the TM-EIAO requires a level of 5 dB(A) below the appropriate ANLs for new proposed equipment and, therefore, 55 dB(A) and 45 dB(A) in time period of 0700 – 2300 and 2300 – 0700 respectively have been adopted in this assessment, which are also considered to be lower than the prevailing background noise level in the concerned area.

The noisy equipment and their SWLs for the proposed pumping station, as well as for

the existing vacuum pumping station are given below. In the existing pumping station, it is assumed that only one sewage pump or vacuum pump will be operated at any time and the installed ventilation fan will be operated at day-time when inspection and maintenance are conducted. Furthermore, one sewage pump (SWL higher than the vacuum pump) and the ventilation fan will be operated simultaneously in order to have a conservative noise assessment at day-time.

Noisy Equipment in the Proposed and Existing Pumping Stations

Proposed Pumping Station

Noise Item	No. of Items	SWL/Item, dB(A)
Submersible Pump	3	85
Exhaust Fan	3	73
Mechanically Raked Bar Screen	2	89

Existing Vacuum Pumping Station

Noise Item	No. of Items	SWL/Item, dB(A)
Sewage Pump	1	92
Vacuum Pump	1	80
Ventilation fan	1	89

Assessment Results and Recommended Noise Reduction Measures

Construction Phase

The proposed construction works schedule indicates that there would be no overlapping of the four works items, site clearance, excavation, concreting and miscellaneous works. In addition, it is understood that there are no other construction activities to be proposed nearby which would be undertaken concurrently during the proposed construction period. All items of PME have been assumed to be grouped at a position mid-way of the appropriate geographical centre of the construction site. Distance correction by standard acoustic principles and facade correction have been taken into consideration when the noise levels at the NSRs were calculated. In view of different criterion for residential and educational uses, the noise levels at two nearest NSRs for residential uses (i.e. SR1a and SR1b) and one nearest NSR for educational uses (i.e. SR3) to the construction noise sources have been assessed.

Detailed calculations of the total SWLs of each works item using the standard acoustic principle are shown in Annex B1. The noisiest construction activity would be site clearance activities, with a SWL of 111 dB(A). The maximum noise levels at the nearest sensitive receivers SR1b and SR1a are therefore 79 dB(A) [= 111 dB(A) (total SWL) – 35 dB(A) (distance correction) + 3 dB(A) (facade correction)] and 82 dB(A) respectively. These noise levels exceed the noise criteria of 75 dB(A) for residential uses and therefore, mitigation measures should be applied.

The nearest school (i.e. SR3) is 132m away from the construction works, and a predicted noise level of 65 dB(A) is obtained after applying a distance correction of -50 dB(A), this sensitive receiver is predicted to comply with the criteria of 70 dB(A) {65 dB(A)} for educational uses {examination} without the need for any mitigation measures.

To this end, mobile acoustic barriers are recommended at the southern face of the proposed pumping station where exceedances have been predicted to occur in order to reduce the construction noise impacts. The mobile acoustic barriers are setup such that the line of sight to the construction works is blocked from the village houses of Tai Po Tau Shui Wai (including SR1a and SR1b). A 10 dB(A) noise reduction barrier will also be provided as required. The noise levels at the nearest sensitive receivers SR1a and SR1b are then 69 dB(A) and 72 dB(A) respectively after taking into account the noise attenuation of these mitigation measures together with usage of quiet powered mechanical equipment as assumed in the calculation. These mitigated noise levels comply with the noise criteria of 75 dB(A) for residential uses and as such no further noise mitigation is required.

Besides, good site practice and good planning of works sequence will be implemented on site to further reduce the noise level and achieve the concerned noise requirements.

Operation Phase

Distance correction and on-time usage correction (10 minutes) by standard acoustic principles and facade correction have been taken into consideration when calculating the noise levels at the NSRs. The noise levels at two nearest representative locations, namely NSR SR1a and SR1b have been assessed. Detailed calculations of the noise levels at NSR SR1a and SR1b due to cumulative noise impacts from the operation of

proposed and existing pumping stations are presented in Annex B2. The calculation assumes the two stations would be operating simultaneously at any time unless otherwise specified. Directivity of the noise sources has not taken into account. The noise levels at the nearest sensitive receivers SR1a and SR1b are predicted to be 60 dB(A){52 dB(A)} and 56 dB(A){51 dB(A)} at day-time {night-time}. These noise levels exceed the day-time {night-time} noise criteria of 55 dB(A){45 dB(A)}, therefore, mitigation measures are required.

Acoustic louvers (with a noise reduction level of 20 dB(A)) are recommended for all openings in the facade of the proposed pumping stations facing SR1a and SR1b, i.e. at the northern side of the pumping station. Furthermore, double glazed windows with 6mm thickness glass panes, 100 mm in between and 34 kgm^{-2} surface density will be proposed in order to achieve the 20 dB(A)[1] noise reduction. The ventilation fan in the existing pumping station is also recommended to be retrofitted with an acoustic louver (if applicable), as is the case for the proposed pumping station. Annex B3 shows the detailed calculation of the noise levels after the application of such mitigation measures. As a result, the mitigated noise levels at the nearest sensitive receivers SR1a and SR1b are predicted to be 46 dB(A){42dB(A)} and 43 dB(A){41 dB(A)} at day-time {night-time}. These noise levels comply with the daytime {night-time} noise criteria of 55 dB(A){45 dB(A)}.

[1] Information extracted from Woods Practical Guide to Noise Control, 5th Ed., Woods Acoustics, Woods of Colchester Ltd.

Annex B1: Calculation of Total SWL

Site Clearance

Powered Mechanical Equipment (PME)	Reference	No. Items	SWL/Item dB(A)	Total SWL dB(A)
Breaker, hand-held <20 Kg	CNP024	1	108	108
Excavator	C3/97	1	105	105
Dump Truck	C9/19	1	102	102
Air compressor	CNP003	1	104	104
Generator	C7/45	1	95	95
			Total =	111.4

Excavation Work

Powered Mechanical Equipment (PME)	Reference	No. Items	SWL/Item dB(A)	Total SWL dB(A)
Dump truck	C9/19	1	102	102
Excavator	C3/97	1	105	105
Generator	C7/45	1	95	95
Air compressor	CNP003	1	104	104
			Total =	108.8

Concreting Work

Powered Mechanical Equipment (PME)	Reference	No. Items	SWL/Item dB(A)	Total SWL dB(A)
Mobile Crane	C7/114	1	101	101
Concrete Lorry Mixer	C6/23	1	100	100
Concrete pump	C6/36	1	106	106
Poker (Power Rating limited to 2kW)	C6/32	3	100	105
Generator	C7/45	1	95	95
Air compressor	CNP003	1	104	104
			Total =	110.8

Site Formation Work

Powered Mechanical Equipment (PME)	Reference	No. Items	SWL/Item dB(A)	Total SWL dB(A)
Lorry	C3/59	1	105	105
Compactor	CNP050	1	105	105
Generator	C7/45	1	95	95
Air compressor	CNP003	1	104	104
Roller	C8/25	1	96	96
			Total =	109.8

Annex B2 (sheet 1 of 2) : Calculation of Operational Noise Levels at NSRs - Un-mitigated (day-time operation)

(1) Predicted Cumulative Noise Levels at SR1a

Proposed station

Items	No. of Items	Remark	SWL /Item [1]	Total SWL dB(A)	Enclosed [3]	screening Reduction dB(A)	Distance (m)	Distance Attenuation d B(A)	facade correction d B(A)	On-time usage correction [5] dB(A)	SPL at NSR
Submersible Pump	3	2 duty + 1 standby	85	90	partially	-10	31	-38	3	-	45
Exhaust Fan with acoutic lourve [4]	3	-	73	78		-10	36	-39	3	-	32
Mechanically raked fine screen	2	1 duty + 1 standby	89	92	partially	-10	31	-38	3	-	47
									SPL =		49

Existing station

Items	No. of Items	Remark	SWL /Item [2]	Total SWL dB(A)	Enclosed	screening Reduction dB(A)	Distance (m)	Distance Attenuation d B(A)	facade correction d B(A)	On-time usage correction [5] dB(A)	SPL at NSR
Sewage pump	1		92	92	partially	-10	16	-32	3	-5	48
Vacuum Pump	1	Either one is operated at any time	80	80							
Ventilation Fan	1	-	89	89			10	-28	3	-5	59
									SPL =		60

[1] Same levels as listed in the Project Profile - Ma On Shan Area 108 Pumping Station

[2] Estimated SWL of sewage pump based on those listed in "Good Practices on Pumping System Noise Control" by EPD, power and speed from pump specification
SWL of vacuum pump based on pump specification, 72 dB(A) @ 1m
SWL of exhaust fan from the EIA report "Tai Po Sewage Treatment Plant"

[3] Un-openable/openable windows located at façade facing to the nearest NSRs, though all equipment are in enclosed structure

[4] Exhaust fan at wall facing Tai Po Road - Tai Wo, cannot be "seen" by SR1a and SR1b

[5] The equipment is assumed to operate at most 10 minutes within every 30 minutes period

Total SPL = 60

(2) Predicted Cumulative Noise Levels at SR1b

Proposed station

Items	No. of Items	Remark	SWL /Item	Total SWL dB(A)	Enclosed	screening Reduction dB(A)	Distance (m)	Distance Attenuation d B(A)	facade correction d B(A)	On-time usage correction [5] dB(A)	SPL at NSR
Submersible Pump	3	2 duty + 1 standby	85	90	partially	-10	29	-37	3	-	46
Exhaust Fan with acoutic lourve	3	-	73	78		-10	35	-39	3	-	32
Mechanically raked fine screen	2	1 duty + 1 standby	89	92	partially	-10	29	-37	3	-	48
									SPL =		50

Existing station

Items	No. of Items	Remark	SWL /Item	Total SWL dB(A)	Enclosed	screening Reduction dB(A)	Distance (m)	Distance Attenuation d B(A)	facade correction d B(A)	On-time usage correction [5] dB(A)	SPL at NSR
Sewage pumps	1		92	92	partially	-10	25	-36	3	-5	44
Vacuum Pump	1	Either one is operated at any time	72	72							
Ventilation Fan	1	-	89	89			19	-34	3	-5	54
									SPL =		54

Total SPL = 56

Annex B2 (sheet 2 of 2) : Calculation of Operational Noise Levels at NSRs - Un-mitigated (night-time operation)

(1) Predicted Cumulative Noise Levels at SR1a

Proposed station

Items	No. of Items	Remark	SWL /Item [1]	Total SWL dB(A)	Enclosed[3]	screening Reduction dB(A)	Distance (m)	Distance Attenuation d B(A)	facade correction d B(A)	On-time usage correction[5] dB(A)	SPL at NSR
Submersible Pump	3	2 duty + 1 standby	85	90	partially	-10	31	-38	3	-	45
Exhaust Fan with acoutic lourve[4]	3	-	73	78		-10	36	-39	3	-	32
Mechanically raked fine screen	2	1 duty + 1 standby	89	92	partially	-10	31	-38	3	-	47
									SPL =		49

Existing station

Items	No. of Items	Remark	SWL /Item[2]	Total SWL dB(A)	Enclosed	screening Reduction dB(A)	Distance (m)	Distance Attenuation d B(A)	facade correction d B(A)	On-time usage correction[5] dB(A)	SPL at NSR
Sewage pump	1		92	92	partially	-10	16	-32	3	-5	48
Vacuum Pump	1	Either one is operated at any time	80	80							
Ventilation Fan	1	-	89	89							
									SPL =		48

Total SPL =	**52**

[1] Same levels as listed in the Project Profile - Ma On Shan Area 108 Pumping Station

[2] Estimated SWL of sewage pump based on those listed in "Good Practices on Pumping System Noise Control" by EPD, power and speed from pump specification
SWL of vacuum pump based on pump specification, 72 dB(A) @ 1m
SWL of exhaust fan from the EIA report "Tai Po Sewage Treatment Plant"

[3] Un-openable/openable windows located at façade facing to the nearest NSRs, though all equipment are in enclosed structure

[4] Exhaust fan at wall facing Tai Po Road - Tai Wo, cannot be "seen" by SR1a and SR1b

[5] The equipment is assumed to operate at most 10 minutes within every 30 minutes period

(2) Predicted Cumulative Noise Levels at SR1b

Proposed station

Items	No. of Items	Remark	SWL /Item	Total SWL dB(A)	Enclosed	screening Reduction dB(A)	Distance (m)	Distance Attenuation d B(A)	facade correction d B(A)	On-time usage correction[5] dB(A)	SPL at NSR
Submersible Pump	3	2 duty + 1 standby	85	90	partially	-10	29	-37	3	-	46
Exhaust Fan with acoutic lourve	3	-	73	78		-10	35	-39	3	-	32
Mechanically raked fine screen	2	1 duty + 1 standby	89	92	partially	-10	29	-37	3	-	48
									SPL =		50

Existing station

Items	No. of Items	Remark	SWL /Item	Total SWL dB(A)	Enclosed	screening Reduction dB(A)	Distance (m)	Distance Attenuation d B(A)	facade correction d B(A)	On-time usage correction[5] dB(A)	SPL at NSR
Sewage pumps	1		92	92	partially	-10	25	-36	3	-5	44
Vacuum Pump	1	Either one is operated at any time	72	72							
Ventilation Fan	1	-	89	89							
									SPL =		44

Total SPL =	**51**

Annex B3 (sheet 1 of 2): Calculation of Operational Noise Levels at NSRs - Mitigated (day-time operation

(1) Predicted Cumulative Noise Levels at SR1a

Proposed station

Items	No. of Items	Remark	SWL /Item [1]	Total SWL dB(A)	Enclosed[3]	screening Reduction[5] dB(A)	Distance (m)	Distance Attenuation d B(A)	facade correction d B(A)	On-time usage correction[6] dB(A)	SPL at NSR
Submersible Pump	3	2 duty + 1 standby	85	90	enclosed	-20	31	-38	3	-	35
Exhaust Fan with acoutic lourve[4]	3	-	73	78		-10	36	-39	3	-	32
Mechanically raked fine screen	2	1 duty + 1 standby	89	92	enclosed	-20	31	-38	3	-	37
									SPL =		40

Existing station

Items	No. of Items	Remark	SWL /Item[2]	Total SWL dB(A)	Enclosed	screening Reduction[5] dB(A)	Distance (m)	Distance Attenuation d B(A)	facade correction d B(A)	On-time usage correction[6] dB(A)	SPL at NSR
Sewage pump	1		92	92	enclosed	-20	16	-32	3	-5	38
Vacuum Pump	1	Either one is operated at any time	80	80							
Ventilation Fan with acoutic lourve	1	-	73	73			10	-28	3	-5	43
									SPL =		44

[1] Same levels as listed in the Project Profile - Ma On Shan Area 108 Pumping Station

[2] Estimated SWL of sewage pump based on those listed in "Good Practices on Pumping System Noise Control" by EPD, power and speed from pump specification
SWL of vacuum pump based on pump specification, 72 dB(A) @ 1m
SWL of exhaust fan from the EIA report "Tai Po Sewage Treatment Plant"

[3] Un-openable/openable windows located at façade facing to the nearest NSRs, though all equipment are in enclosed structure

[4] Exhaust fan at wall facing Tai Po Road - Tai Wo, cannot be "seen" by SR1a and SR1b

[5] Enclosure correction of -20 dB (A) achieved when the mitigration measures mentioned in the text applied

[6] The equipment is assumed to operate at most 10 minutes within every 30 minutes period

Total SPL = 46

(2) Predicted Cumulative Noise Levels at SR1b

Proposed station

Items	No. of Items	Remark	SWL /Item	Total SWL dB(A)	Enclosed	screening Reduction dB(A)	Distance (m)	Distance Attenuation d B(A)	facade correction d B(A)	On-time usage correction[6] dB(A)	SPL at NSR
Submersible Pump	3	2 duty + 1 standby	85	90	enclosed	-20	29	-37	3	-	36
Exhaust Fan with acoutic lourve	3	-	73	78		-10	35	-39	3	-	32
Mechanically raked fine screen	2	1 duty + 1 standby	89	92	enclosed	-20	29	-37	3	-	38
									SPL =		40

Existing station

Items	No. of Items	Remark	SWL /Item	Total SWL dB(A)	Enclosed	screening Reduction dB(A)	Distance (m)	Distance Attenuation d B(A)	facade correction d B(A)	On-time usage correction[6] dB(A)	SPL at NSR
Sewage pumps	1		92	92	enclosed	-20	25	-36	3	-5	34
Vacuum Pump	1	Either one is operated at any time	72	72							
Ventilation Fan with acoutic lourve	1	-	73	73			19	-34	3	-5	38
									SPL =		39

Total SPL = 43

Annex B3 (sheet 2 of 2): Calculation of Operational Noise Levels at NSRs - Mitigated (night-time operation)

(1) Predicted Cumulative Noise Levels at SR1a

Proposed station

Items	No. of Items	Remark	SWL /Item [1]	Total SWL dB(A)	Enclosed[3]	screening Reduction[5] dB(A)	Distance (m)	Distance Attenuation d B(A)	facade correction d B(A)	On-time usage correction[6] dB(A)	SPL at NSR
Submersible Pump	3	2 duty + 1 standby	85	90	enclosed	-20	31	-38	3	-	35
Exhaust Fan with acoutic lourve[4]	3	-	73	78		-10	36	-39	3	-	32
Mechanically raked fine screen	2	1 duty + 1 standby	89	92	enclosed	-20	31	-38	3	-	37
									SPL =		40

Existing station

Items	No. of Items	Remark	SWL /Item[2]	Total SWL dB(A)	Enclosed	screening Reduction[5] dB(A)	Distance (m)	Distance Attenuation d B(A)	facade correction d B(A)	On-time usage correction[6] dB(A)	SPL at NSR
Sewage pump	1	Either one is operated at any time	92	92	enclosed	-20	16	-32	3	-5	38
Vacuum Pump	1		80	80							
Ventilation Fan with acoutic lourve	1	-	73	73							
									SPL =		38

Total SPL = 42

[1] Same levels as listed in the Project Profile - Ma On Shan Area 108 Pumping Station

[2] Estimated SWL of sewage pump based on those listed in "Good Practices on Pumping System Noise Control" by EPD, power and speed from pump specification
SWL of vacuum pump based on pump specification, 72 dB(A) @ 1m
SWL of exhaust fan from the EIA report "Tai Po Sewage Treatment Plant"

[3] Un-openable/openable windows located at façade facing to the nearest NSRs, though all equipment are in enclosed structure

[4] Exhaust fan at wall facing Tai Po Road - Tai Wo, cannot be "seen" by SR1a and SR1b

[5] Enclosure correction of -20 dB (A) achieved when the mitigration measures mentioned in the text applied

[6] The equipment is assumed to operate at most 10 minutes within every 30 minutes period

(2) Predicted Cumulative Noise Levels at SR1b

Proposed station

Items	No. of Items	Remark	SWL /Item	Total SWL dB(A)	Enclosed	screening Reduction dB(A)	Distance (m)	Distance Attenuation d B(A)	facade correction d B(A)	On-time usage correction[6] dB(A)	SPL at NSR
Submersible Pump	3	2 duty + 1 standby	85	90	enclosed	-20	29	-37	3	-	36
Exhaust Fan with acoutic lourve	3	-	73	78		-10	35	-39	3	-	32
Mechanically raked fine screen	2	1 duty + 1 standby	89	92	enclosed	-20	29	-37	3	-	38
									SPL =		40

Existing station

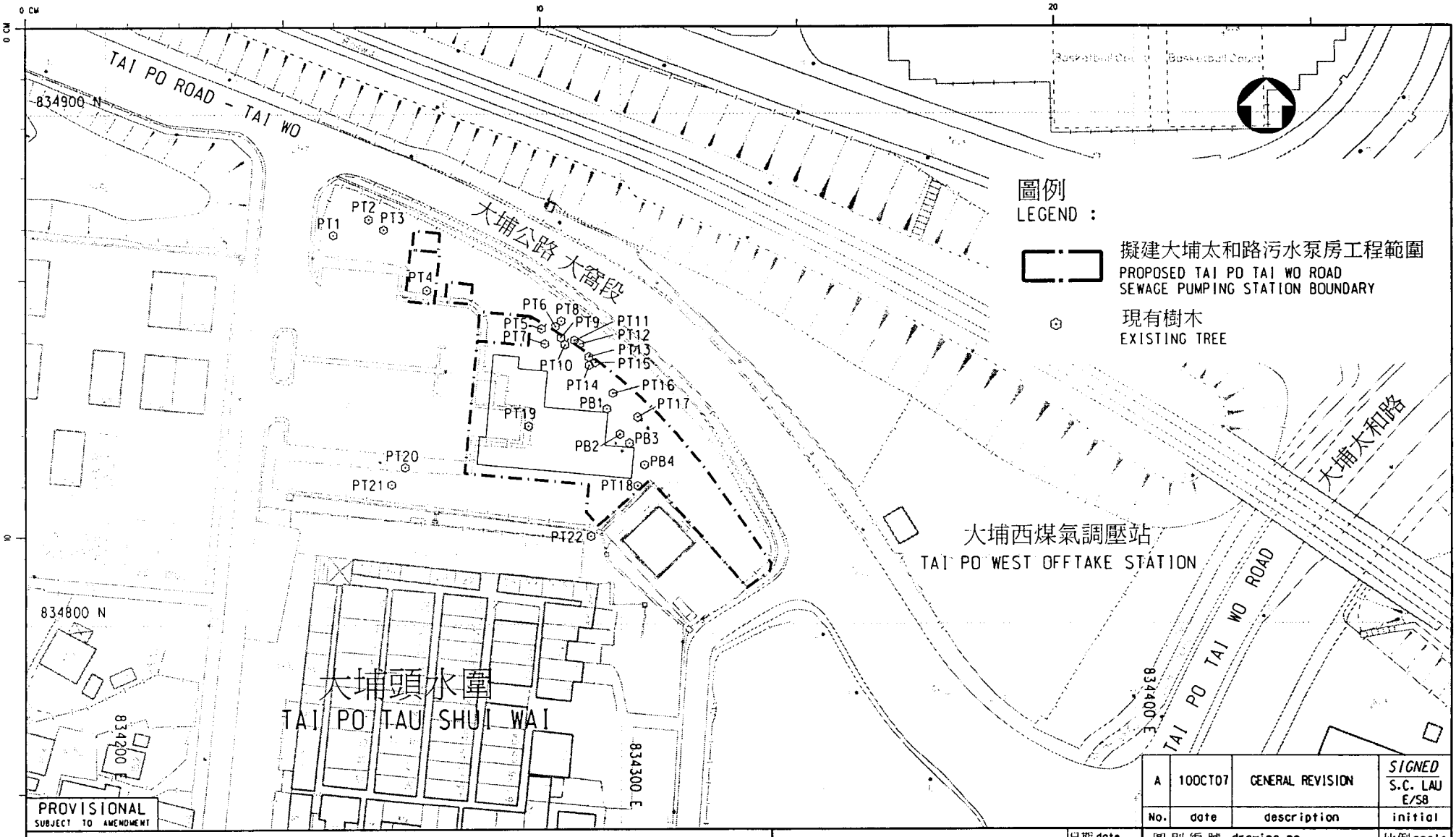
Items	No. of Items	Remark	SWL /Item	Total SWL dB(A)	Enclosed	screening Reduction dB(A)	Distance (m)	Distance Attenuation d B(A)	facade correction d B(A)	On-time usage correction[6] dB(A)	SPL at NSR
Sewage pumps	1	Either one is operated at any time	92	92	enclosed	-20	25	-36	3	-5	34
Vacuum Pump	1		72	72							
Ventilation Fan with acoutic lourve	1	-	73	73							
									SPL =		34

Total SPL = 41

Project Profile

for Tai Po Tai Wo Road Sewage Pumping Station

APPENDIX C – LOCATION OF EXISTING TREES



No.	date	description	initial
A	10OCT07	GENERAL REVISION	SIGNED S.C. LAU E/S8

圖則名稱 drawing title

大埔太和路污水泵房 - 現有樹木位置圖

TAI PO TAI WO ROAD SEWAGE PUMPING STATION - TREE SURVEY

繪畫 drawn	SIGNED	L. L. NG	日期 date 11MAY2007
核對 checked	SIGNED	Ir S. C. LAU	日期 date 11MAY2007
批核 approved	SIGNED	Ir H. S. KAN	日期 date 11MAY2007
部門 office	污水工程部 SEWERAGE PROJECTS DIVISION		

圖則編號 drawing no. DDN/237DS1/8074A

比例 scale 1:1000

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Tai Po Tai Wo Road Sewage Pumping Station

Existing Trees and Crops in Vicinity of Pumping Station Site

Trees:

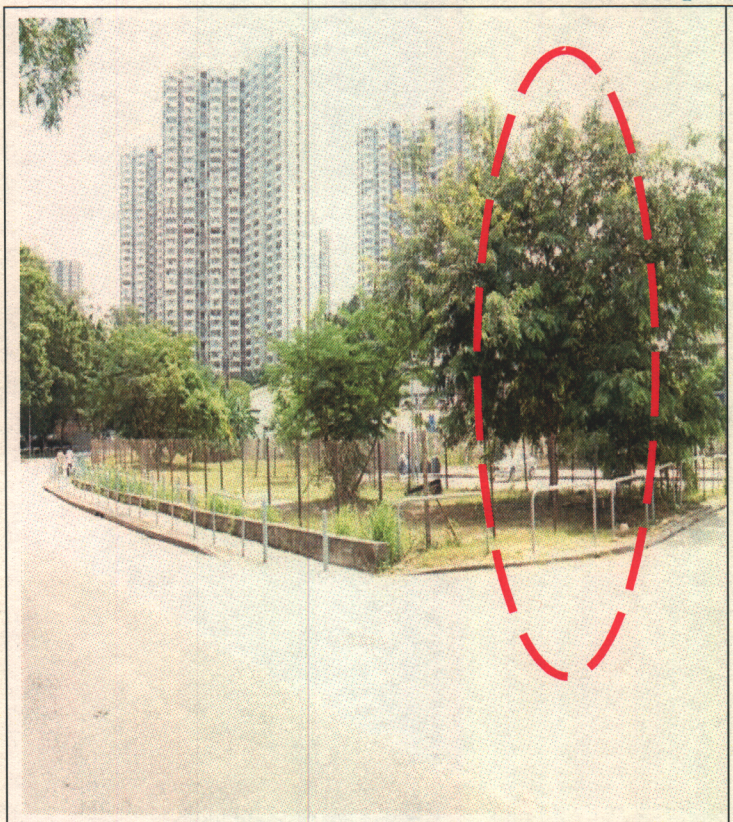
No.	Tree No.	Spread (m)	Height (m)	Diameter (m)	Species
1	PT1	8	7	0.28	*Dalbergia balansae* (南嶺黃檀)
2	PT2	6	4	0.13	*Dalbergia balansae* (南嶺黃檀)
3	PT3	5	4	0.18	*Dalbergia balansae* (南嶺黃檀)
4	PT4	2	4	0.10	*Dalbergia balansae* (南嶺黃檀)
5	PT5	7	4	0.30	*Dalbergia balansae* (南嶺黃檀)
6	PT6	4	5	0.10	*Litsea monopetala* (假柿樹)
7	PT7	8	6	0.25	*Dalbergia balansae* (南嶺黃檀)
8	PT8	4	5	0.15	*Dalbergia balansae* (南嶺黃檀)
9	PT9	3	5	0.12	*Dalbergia balansae* (南嶺黃檀)
10	PT10	5	5	0.20	*Dalbergia balansae* (南嶺黃檀)
11	PT11	6	6	0.30	*Dalbergia balansae (南嶺黃檀)*
12	PT12	4	5	0.15	*Dalbergia balansae (南嶺黃檀)*
13	PT13	6	6	0.30	*Dalbergia balansae (南嶺黃檀)*
14	PT14	1.5	1	0.05	*Dalbergia balansae (南嶺黃檀)*
15	PT15	1.5	1	0.06	*Dalbergia balansae (南嶺黃檀)*
16	PT16	11	6	0.40	*Dalbergia balansae (南嶺黃檀)*
17	PT17	5	5	0.40	*Dalbergia balansae (南嶺黃檀)*
18	PT18	4	3	0.10	*Dalbergia balansae (南嶺黃檀)*
19	PT19	8	6	0.14	*Dalbergia balansae (南嶺黃檀)*
20	PT20	5	5	0.25	*Dalbergia balansae* (南嶺黃檀)
21	PT21	2	4	0.15	*Juniperus chinensis (圓柏)*
22	PT22	6	5	0.44	*Clausena lansium (Lour.) Skeels (黃皮)*

Crops:

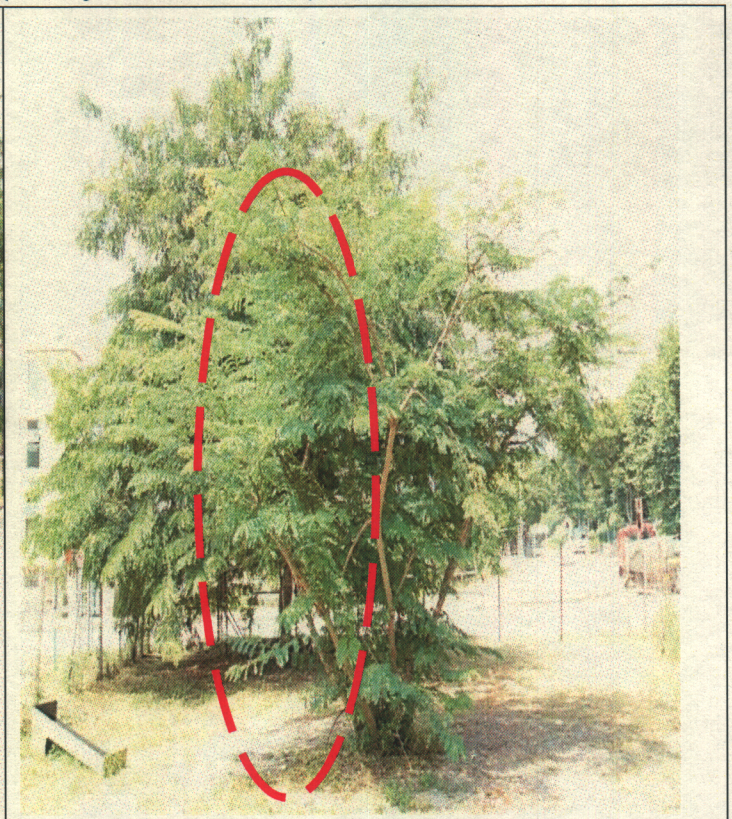
No.	Tree No.	Spread (m)	Height (m)	Diameter (m)	Species
1	PB1	4	4	0.13	*Group of Musa Paradisaca 甘蕉*
2	PB2	4	4	0.12	*Group of Musa Paradisaca 甘蕉*
3	PB3	2	2	0.10	*Group of Musa Paradisaca 甘蕉*
4	PB4	4	4	0.13	*Group of Musa Paradisaca 甘蕉*

Tai Po Tai Wo Road Sewage Pumping Station

Photo of Trees and Crops (surveyed on 5.10.2007)



PT1



PT2



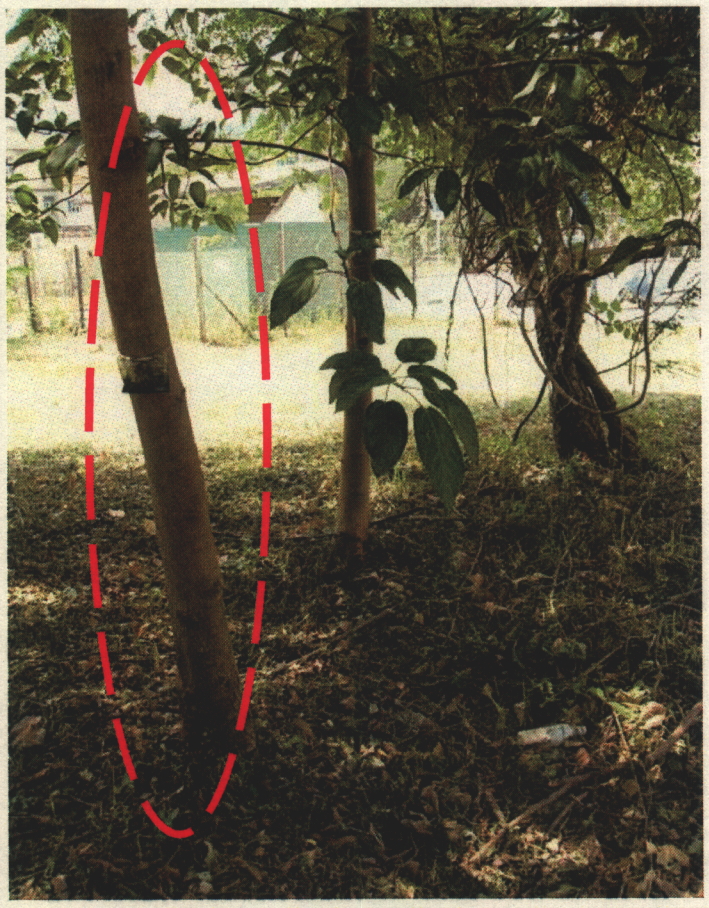
PT3



PT4



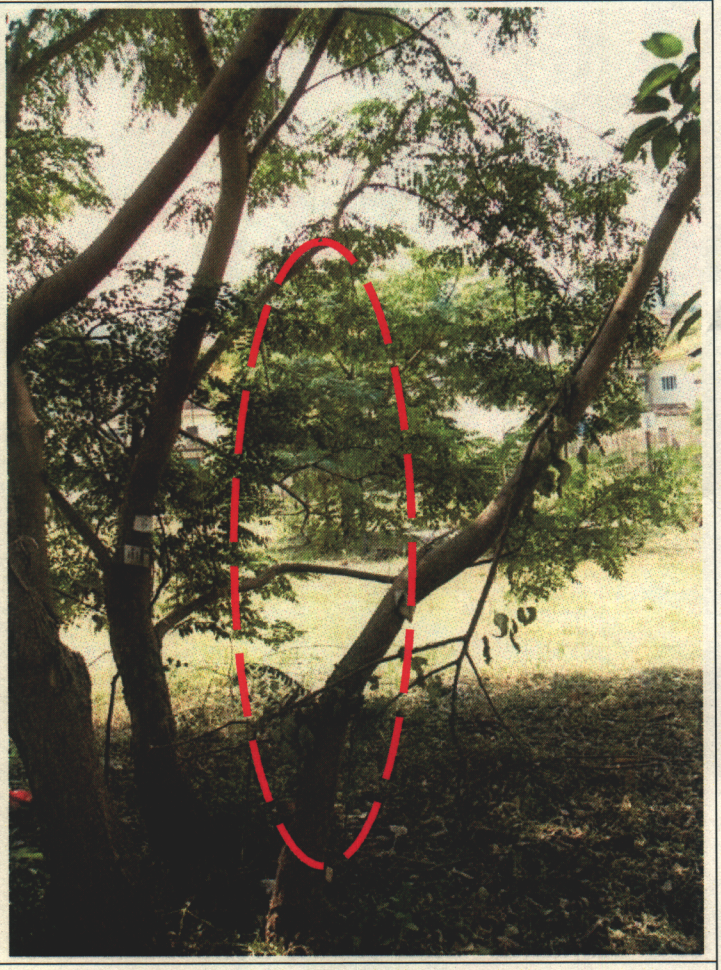
PT5



PT6



PT8



PT9



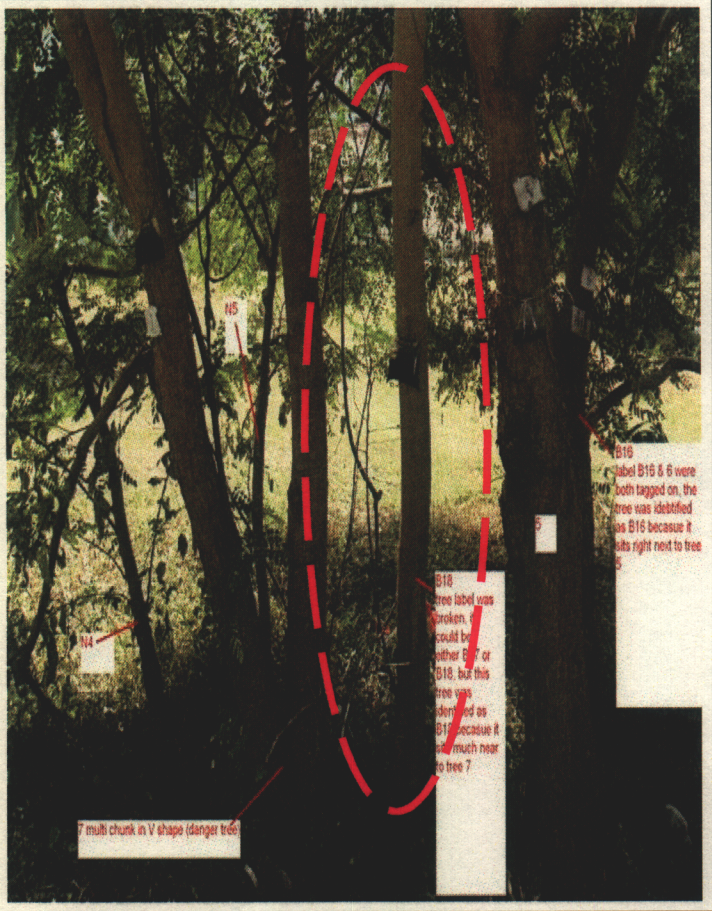
PT7



PT10



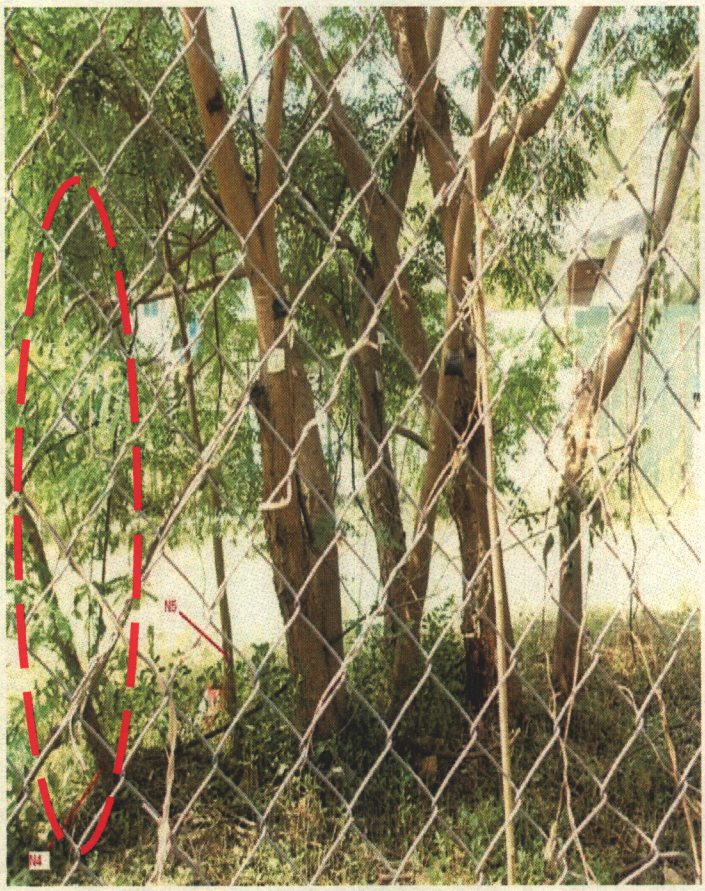
PT11



PT12



PT13



PT15



PT14



PT19



PT16



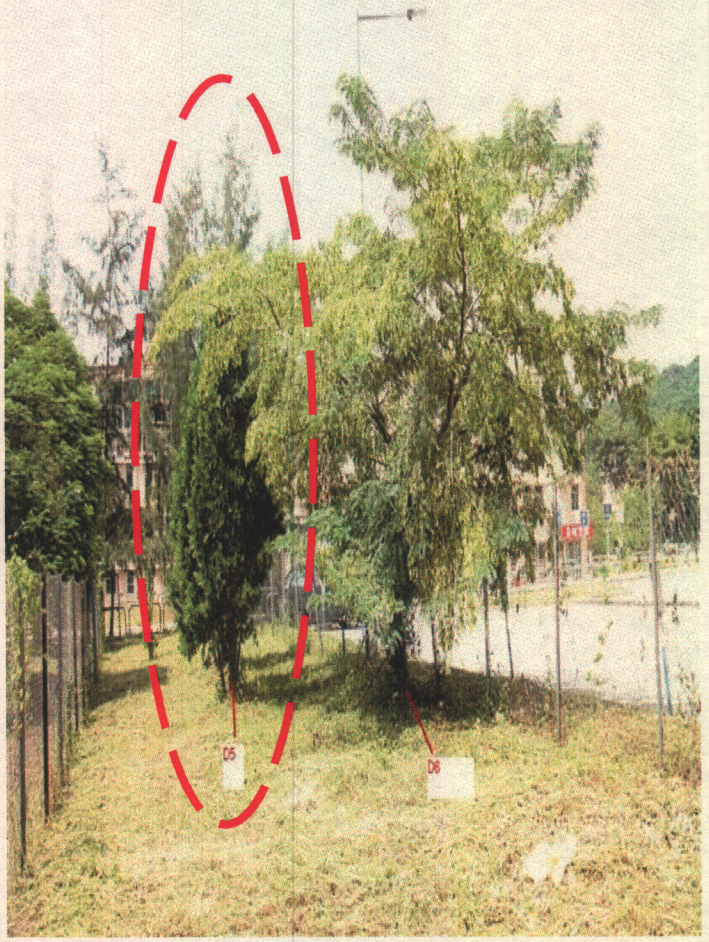
PT17



PT18



PT20



PT21



PT22



PB1



PB2

	
PB3	**PB4**

Project Profile

for Tai Po Tai Wo Road Sewage Pumping Station

Proposed Measures for Preservation and Protection of Existing Trees

General Requirements

1. A Tree Preservation and Protection Plan is to be submitted by the contactor before commencing any works on site which may affect any trees.

2. A person will be assigned by the contractor to oversee the implementation of Tree Preservation and Protection Plan. The person assigned will be working full time on site but not necessarily working solely for matters related to preservation and protection of existing trees.

Tree Survey

1. A tree survey is to be carried out by the contractor and the survey record will be submitted to DSD at the commencement of the works unless otherwise directed by DSD.

2. The tree survey record will cover all existing trees within the site or within 2m of the boundary of the designated project and any other trees likely to be affected by the works. Assessment of each individual tree will be carried out as far as practical. Where it is not practical to do so and tree group survey methodology is necessary, DSD's agreement to the tree group survey methodology will need to be sought beforehand. Each tree or tree group will be assigned a unique identification number according to a numbering system agreed with DSD beforehand. The tree survey report will be in the form of an A4-sized and bound report.

Transplanting of Existing Trees

The following requirements in respect of tree transplanting, either within or off the site are to be fulfilled by the contractor:

1. Transplantation is limited only to those trees earmarked for such purposes and labeled for such purpose on site, or those as directed or approved by DSD, and

2. Commencement of any work related to tree transplanting on site is to proceed only after DSD is satisfied that the contractor has complied with the requirements stipulated for completion before tree transplanting work commences.

Preservation and Protection of Existing Trees

Greatest care to avoid any damage to the preserved trees will be exercised by the contractor and the following requirements in respect of all the preserved trees will be complied with:

1. No nails or other fixings will be driven into the trees, including the exposed tree roots.

2. No fencing, services, or signs other than the identification labels or markings required will be attached to any part of the trees.

3. No trees will be used as anchorages for ropes or chains used in guying or pulling or for any other purposes.

4. No soil, material, equipment or machinery will be stockpiled or stored within the tree protection zones.

5. No site offices, workshops, canteens, containers or similar structures will be installed within the tree protection zones.

6. Petrol, oil, bitumen, creosote, cement and other materials likely to be injurious to the trees will be kept away from the tree protection zones, and any accidental spills of these materials will be cleaned up immediately.

7. Excessive water will be drained away from the tree protection zones to prevent damage to tree roots by asphyxiation.

8. The surface on slopes will be shaped so that water will not drain to the tree trunks but bypass them.

9. No passage or parking of vehicles and no operation of equipment or machinery will take place within the tree protection zones unless otherwise agreed by DSD.

10. No stripping of surface vegetation or top layer of soil, and no paving or earth filling will be carried out within the tree protection zone unless otherwise agreed by DSD.

11. No fires will be lit within the tree protection zone or in a position where the flames will likely extend to within 5 m of foliage, branches or trunks of the trees, bearing in mind the size of the fire and the wind direction.

12. No concrete mixing, gas tank filling, paintbrush and tool cleaning, or equipment maintenance will be carried out within the tree protection zones.

13. Any necessary scarification or cultivation within the tree protection zones will be carried out carefully by hand so as not to cause damage to the trees, in particular the bark and the roots.

14. Any equipment, in particular delivery vehicles, overhead cranes, mechanical excavators, drilling rigs and piling rigs, will be carefully operated so as not to cause striking of the trunks, branches, foliage or root collars of the trees.

15. The trees to be felled, which are adjacent to or within a continuous canopy of the preserved trees, will be carefully removed, and if necessary in sections, but bulldozers will not be used in any circumstances, so as not to cause damage such as scraping bark off trunks or breaking branches to the preserved trees.

16. Where it is necessary to use herbicides to kill any vegetation, herbicides that can leach through the soil, such as the products containing sodium chlorate, and any other herbicides that are injurious to the trees will not be used.

17. Allowance will be made for the slope of the ground so that damaging materials such as concrete washings, mortar or diesel oil cannot run towards the trees.

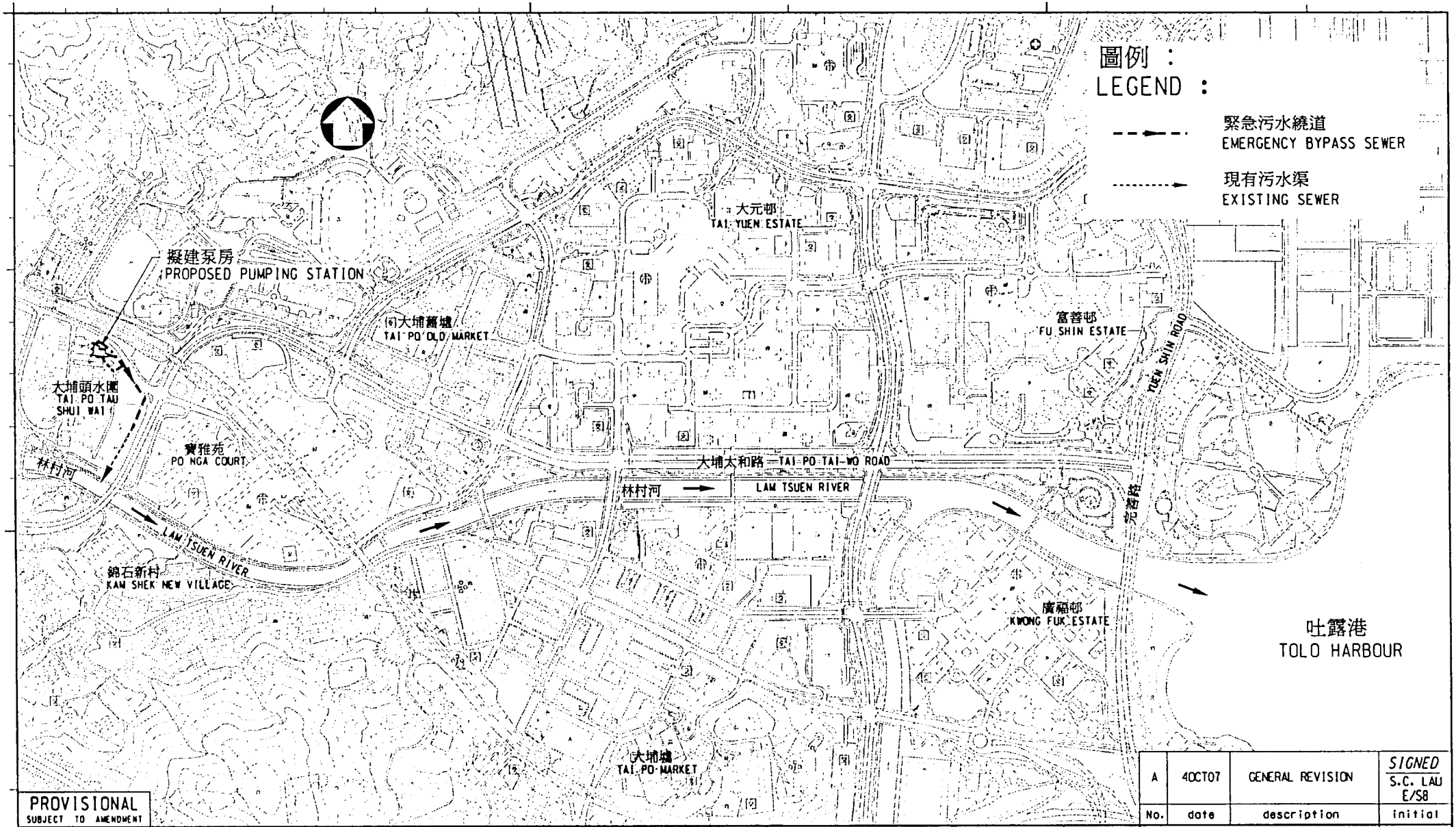
18. Alkaline clays or limestones will not be used for filling or paving, concrete will be mixed on a thick plastic tarpaulin or outside the site, and mixing trucks will not be rinsed out on the site, so as not to cause changes, in particular increases, in soil pH.

19. All building debris and chemical wastes will be hauled away for proper disposal, and in any circumstances will not be burned or buried on the site or be disposed of by pouring them on the soil within the site.

Project Profile

for Tai Po Tai Wo Road Sewage Pumping Station

APPENDIX D – EMERGENCY OVERFLOW BYPASS LOCATION



PROVISIONAL
SUBJECT TO AMENDMENT

No.	date	description	initial
A	4OCT07	GENERAL REVISION	SIGNED S.C. LAU E/S8

圖則名稱 drawing title

大埔太和路污水泵房 - 緊急繞道排放點位置圖
TAI PO TAI WO ROAD SEWAGE PUMPING STATION - DISCHARGE POINT OF EMERGENCY BYPASS

繪畫 drawn	SIGNED	K. W. FONG	日期 date 11MAY2007
核對 checked	SIGNED	Ir S. C. LAU	日期 date 11MAY2007
批核 approved	SIGNED	Ir H. S. KAN	日期 date 11MAY2007
部門 office	污水工程部 SEWERAGE PROJECTS DIVISION		

圖則編號 drawing no. DDN/237DS1/8075A

比例 scale 1:10000

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GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

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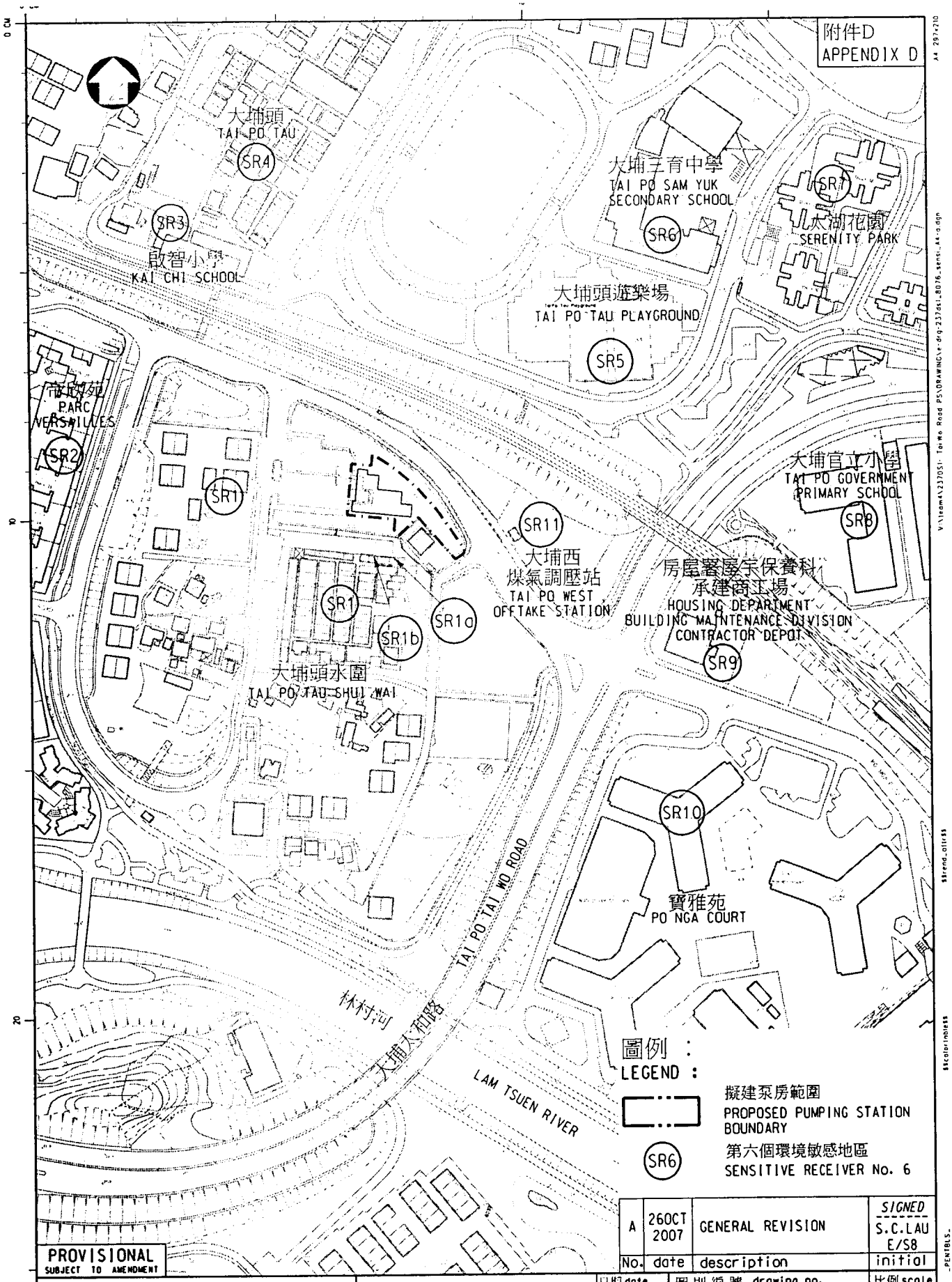
Project Profile

for Tai Po Tai Wo Road Sewage Pumping Station

APPENDIX E – EXISTING SENSITIVE RECEIVERS



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PROVISIONAL
SUBJECT TO AMENDMENT

圖則名稱 drawing title
大埔太和路污水泵房 -
環境敏感地區位置圖
TAI PO TAI WO ROAD
SEWAGE PUMPING STATION -
LOCATION OF SENSITIVE
RECEIVERS

繪圖 drawn	SIGNED K. W. FONG	日期 date 11MAY2007
核對 checked	SIGNED Ir S. C. LAU	日期 date 11MAY2007
批核 approved	SIGNED Ir H. S. KAN	日期 date 11MAY2007
部門 office	污水工程部 SEWERAGE PROJECTS DIVISION	

圖則編號 drawing no. DDN/237DS1/8076A
比例 scale 1:2500

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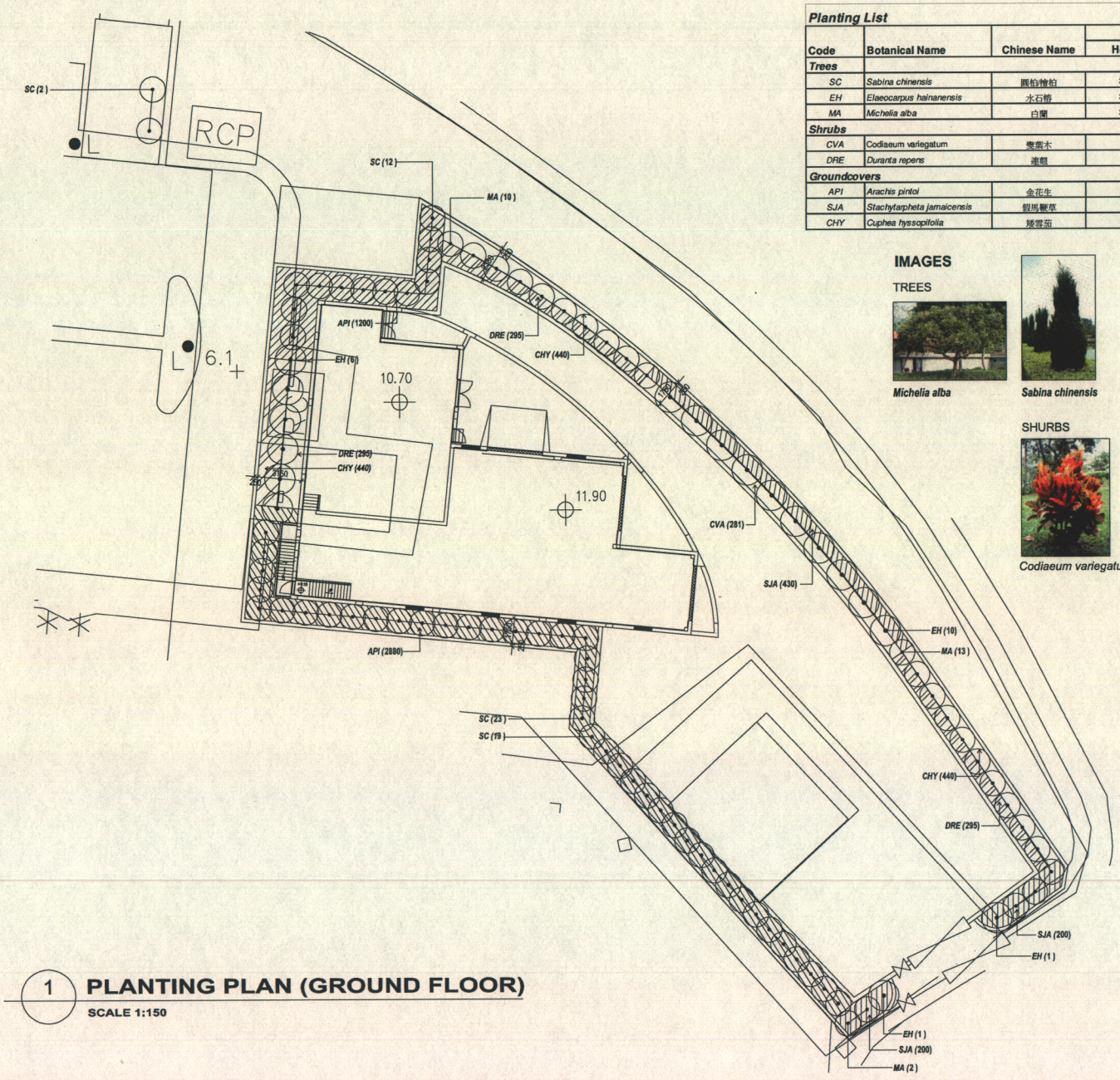
Project Profile

for Tai Po Tai Wo Road Sewage Pumping Station

APPENDIX F – CONCEPTUAL DESIGN OF APPEARANCE OF PUMPING STAITON

Planting List

Code	Botanical Name	Chinese Name	Purchase Size Height	Purchase Size Spread	Spacing	Quantity
Trees						
SC	Sabina chinensis	圓柏/檜柏	3500	1600	1500	56
EH	Elaeocarpus hainanensis	水石榕	3500	3000	2000	18
MA	Michelia alba	白蘭	3500	1600	1500	23
Shrubs						
CVA	Codiaeum variegatum	雙葉木	300	300	300	281
DRE	Duranta repens	連翹	500	300	250	885
Groundcovers						
API	Arachis pintoi	金花生	200	200	200	4080
SJA	Stachytarpheta jamaicensis	假馬鞭草	300	300	250	830
CHY	Cuphea hyssopifolia	矮雪茄	200	200	200	1320



IMAGES

TREES

Michelia alba

Sabina chinensis



Elaeocarpus hainanensis

SHURBS

Codiaeum variegatum



Duranta repens

GROUNDCOVERS



Arachis pintoi



Cuphea hyssopifolia



Stachytarpheta jamaicensis

1 PLANTING PLAN (GROUND FLOOR)

SCALE 1:150

Rev	Issue State	Amendment	By	Chk.	App.	Date

Client

香港特別行政區政府渠務署
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE
HONG KONG
SPECIAL ADMINISTRATIVE REGION

MEINHARDT
Meinhardt Infrastructure and Environment Ltd.
迈进基建环保工程顾问有限公司

Project

TAI PO TAI WO ROAD
SEWAGE PUMPING STATION AND
RISING MAINS

Title

PUMPING STATION
LANDSCAPE DESIGN

Drawn	Checked	Approved
MT	SL	AW
Scale: As Shown	CAD File No.	Date: SEPT. 2007
First Issued: AUG. 2007	Figure No. 6.3	Rev.

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Planting List

Code	Botanical Name	Chinese Name	Purchase Size Height	Purchase Size Spread	Spacing	Quantity
Groundcovers						
API	*Arachis pintoi*	金花生	200	200	200	1525
ACO	*Axonopus compressus*	地毯草	200	200	200	625
CHY	*Cuphea hyssopifolia*	矮雪茄	200	200	200	712
Shrubs						
ABE	*Alternanthera ficoides'variegata'*	白莧草	300	300	250	438
APA	*Alternanthera paronychioides*	綠莧草	300	300	250	863
DRE	*Duranta repens*	連翹	500	300	250	654
Climbers						
BSP	*Bougainvillea spectabilis*	毛巾	500	700	450	95

IMAGES

GROUNDCOVERS



Arachis pintoi



Axonopus compressus



Cuphea hyssopifolia

CLIMBERS



Bougainvillea spectabilis

SHRUBS



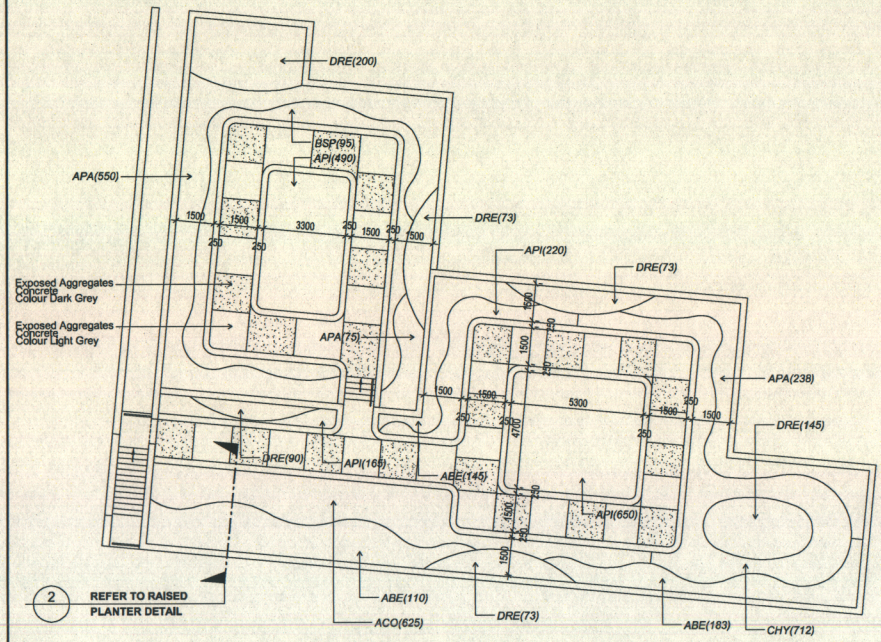
Alternanthera ficoides 'variegata'



Alternanthera paronychioides

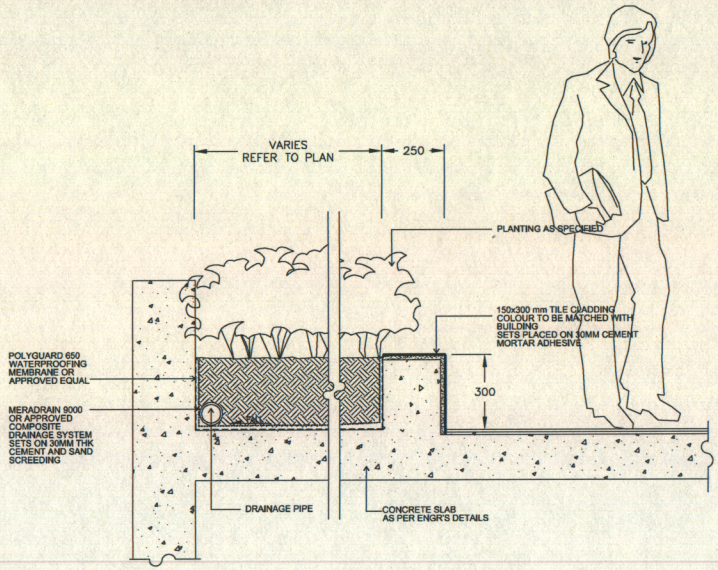


Duranta repens



1 **PLANTING PLAN (ROOF GARDEN)**

SCALE 1:100



2 **RAISE PLANTER SECTION (ON SLAB)**

SCALE 1:10

Rev	Issue State	Amendment	By	Chk.	App.	Date

Client

香港特別行政區政府渠務署
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

MEINHARDT
Meinhardt Infrastructure and Environment Ltd.
邁瑞華建環保工程顧問有限公司

Project

TAI PO TAI WO ROAD
SEWAGE PUMPING STATION AND RISING MAINS

Title

PUMPING STATION
ROOF GARDEN
LANDSCAPE DESIGN

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MT	SL	AW
Scale 1:150	CAD File No.	Date SEPT. 2007
First Issued AUG. 2007	Figure No. 6.4	Rev.

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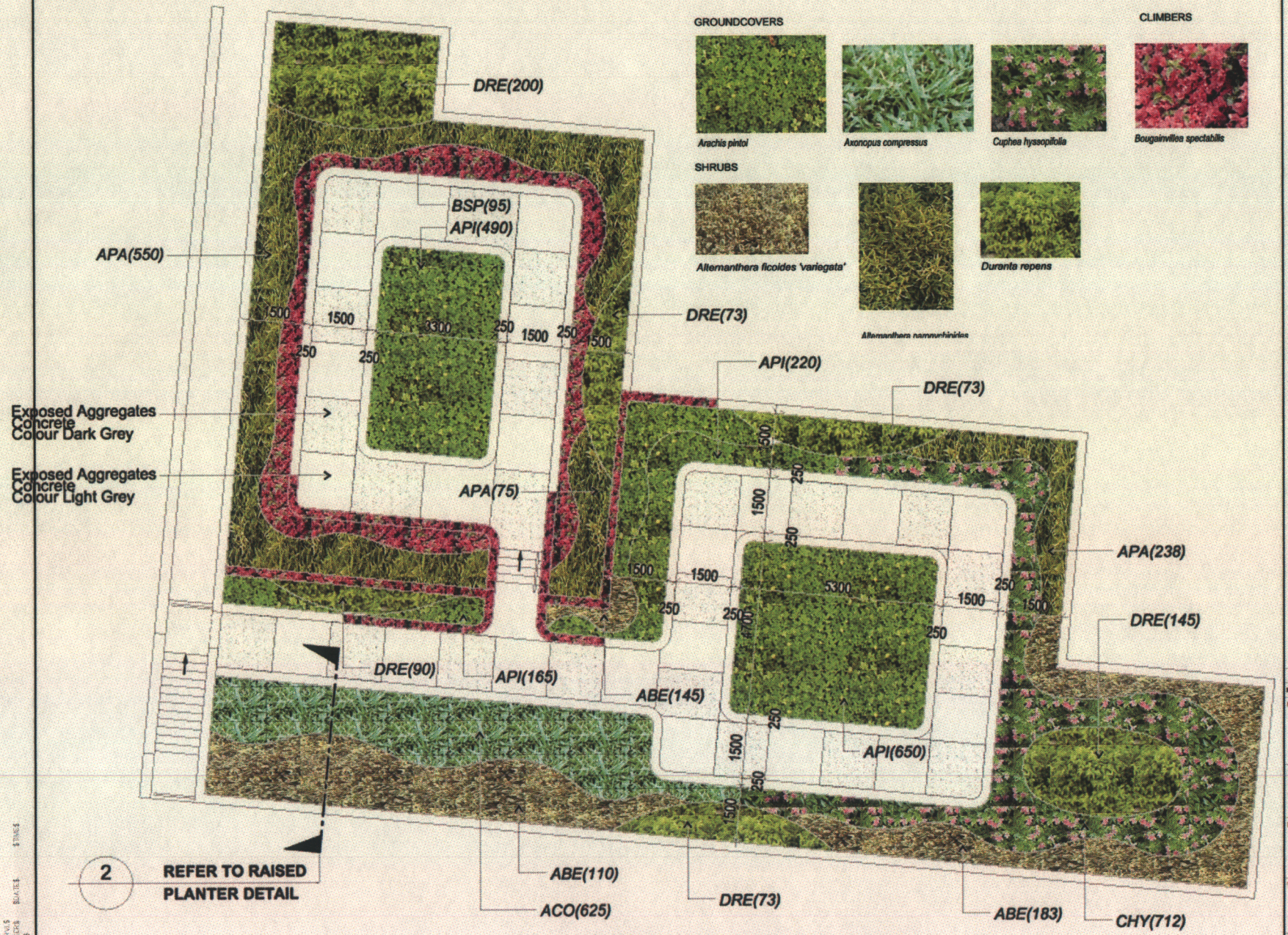

1 PLANTING PLAN (ROOF GARDEN)
SCALE 1:50

Rev	Issue Stale	Amendment	By	Chk	App	Date

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DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

MEINHARDT
Meinhardt Infrastructure and Environment Ltd.
通惠顧問保工程顧問有限公司

Project
TAI PO TAI WO ROAD
SEWAGE PUMPING STATION AND RISING MAINS

Title
PUMPING STATION
ROOF GARDEN
LANDSCAPE DESIGN

Drawn	MT	Checked	SL	Approved	AW
Scale	1:150	CAD File No.		Date	SEPT. 2007
First Issued	AUG. 2007	Figure No.	6.4.1	Rev.	

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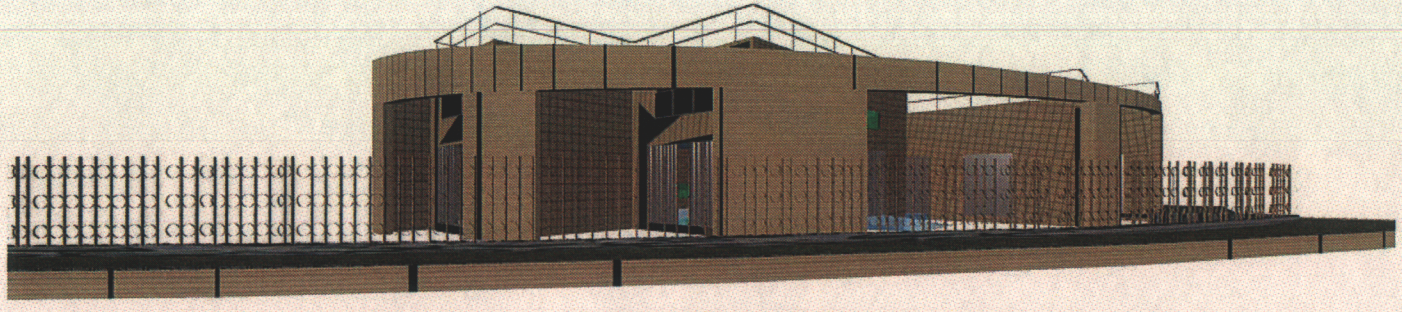
Existing site



New pumping station and proposed landscape work



New pumping station blow up view