



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

Agreement No. CE 38/2006 (DS)

**Tuen Mun Sewerage
Investigation, Design and Construction**

**PROJECT PROFILE
FOR
WESTERN INTERCEPTOR SEWER SEWAGE PUMPING STATION
(FINAL)**

December 2008

Maunsell- Metcalf & Eddy Joint Venture



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1. BASIC INFORMATION

Project Title

- 1.1 Western Interceptor Sewer Sewage Pumping Station (WISSPS) (hereinafter referred to as the Project).

Purpose and Nature of the Project

- 1.2 The project, Tuen Mun Sewerage - Investigation, Design and Construction, which is undertaken by the Drainage Services Department (DSD) aims at implementing the proposed sewerage works recommended by the studies entitled Tuen Mun Sewerage Master Plan Study and Review of Tuen Mun and Tsing Yi Sewerage Master Plans under PWP Items 160DS, 181DS and 346DS.
- 1.3 The scope of the project, Tuen Mun Sewerage - Investigation, Design and Construction, consists of the construction of village sewers and 16 local sewage pumping stations for 37 villages/areas at Tuen Mun, together with a 10km long Western Interceptor Sewer (WIS), Tuen Mun North Sewage Pumping Station and WISSPS such that village sewage will be conveyed by the WIS and existing sewer culvert along Lung Mun Road to the Pillar Point Sewage Treatment Works.
- 1.4 The proposed WISSPS, which is located at the junction of Lung Mun Road and Wong Chu Road, will collect sewage flows from the Tuen Mun North Sewage Pumping Station, together with the sewage flows from 2 villages (Yeung Siu Hang and Tsing Shan Tsuen). The collected sewage flows will then be conveyed to the existing Pillar Point Sewage Treatment Works for treatment before discharged to the sea.

Name of Project Proponent

- 1.5 Drainage Services Department (DSD) is the works department while Environmental Protection Department is the client department.

Location and Scale of Project

- 1.6 The Project is located in Tuen Mun Area. With a design capacity (design average dry weather flow) of about 54,630 m³/day, the WISSPS is located at the junction of Lung Mun Road and Wong Chu Road near to Tsing Shan Tsuen. The proposed location of WISSPS falls within the area zoned "Residential (Group A)" ("R(A)") and is shown as 'Road' on the Tuen Mun Outline Zoning Plan No. S/TM/24. The location of WISSPS is shown in **Figure 1.1**. The Outline Zoning Plan for WISSPS and its surrounding areas are shown in **Figure 1.2**. The layout plan of the sewage pumping station is attached in **Appendix A**.
- 1.7 The proposed sewage pumping station is one storey high (8 – 9 m high) building with one underground floor. The pump sets, inlet chamber and screening facilities are installed at the underground structure. The site area of WISSPS is 3,000m² approximately with building footprint of 47.5 m(L) x 20 m(W).

Rationale for Site Selection

- 1.8 The rationale for site selection is based on the vehicular accessibility, ease for maintenance and minimization of aesthetic impact. The proposed location for the SPS is near to the existing vehicular access (Lung Mun Road) to satisfy operation and maintenance requirement. Also, the proposed location for the Project is not close to any of the village houses, temples and Fung Shui characteristics such that the aesthetic impact would be minimal.



Number and Types of Designated Projects Covered by the Project Profile

- 1.9 The proposed WISSPS is classified as a designated project under F.3(b)(i) and F.3(b)(iii) of Part 1, Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO), as the sewage pumping station has an installed capacity (average dry weather flow) of more than 2,000 m³ per day and its boundary is less than 150 m from an existing residential area and educational institution.

Name and Telephone Number of Contact Person

- 1.10 All queries regarding the Project can be addressed to:

Name: Mr Mike CHO
Department: Project Management Division
Drainage Services Department
Phone No.: 2594 7296
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2. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

Outline of Planning

- 2.1 The Project is delivered by DSD under Agreement No. CE 38/2006 – Tuen Mun Sewerage. Project Management Division and Electrical and Mechanical Projects Division of DSD are jointly responsible for the planning, design and construction supervision of the Project. The construction will be carried out by a qualified contractor. Sewage Treatment Division 1 of DSD will be responsible for operating and maintaining the Pumping Station.

Project Implementation and Timetable

- 2.2 The tentative Project programme is as below.

Stage	Time Period
Design Phase	November 2007 – September 2008
Tender Phase	September 2008 – February 2009
Tender Gazette	February 2009 – May 2009
Construction Phase & Commissioning	May 2009 – End 2012
Operation & Maintenance	Early 2013 onward

Interactions with Other Projects

- 2.3 The construction works for WISSPS would be carried out at the same time as the WIS, but it would not overlap with other projects.



3. POSSIBLE IMPACT ON THE ENVIRONMENT

- 3.1 Based on the nature and location of the Project, potential environmental impacts associated with construction and operation of the Project are identified, as presented below.

Construction Phase

Air Quality

- 3.2 Air sensitive receivers (ASRs) in the vicinity of the work site may be impacted. Possible air quality impacts during construction phase of the Project include:
- fugitive dust arising from site formation, excavation and construction of structures, and wind erosion of open sites and stockpiling areas;
 - emissions from powered mechanical equipment.
- 3.3 The amount of soil materials to be excavated at the WISSPS would be about 13,950 m³ and the excavation period would last for 4 months. The construction period would be 10 hours per day and 26 working days per month while the average volume of excavated materials to be handled per hour would be about 14 m³. The average hauling volume of the truck is 6 m³/trip, therefore, about 3 trips per hour would be required for handling the excavated material. The area of the construction site for the WISSPS would be 3,000 m². The work site of the proposed SPS is limited area. All the trucks would be well covered and dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation would be applied. No adverse dust impact would be expected at nearby ASRs.
- 3.4 The construction works for WIS would be carried out at the same time as the WISSPS. However, trenchless method would be adopted for laying of WIS, dusty construction activities (excavation and backfilling) for section of WIS within 500m of the WISSPS site would not overlap with the major dusty construction activities (such as excavation works and site formation) for WISSPS. No adverse cumulative construction dust impact would be expected.

Noise

- 3.5 Noise impacts during the construction phase may result from various phases of construction activities with the use of powered mechanical equipment. The noise sensitive receivers (NSRs) in the vicinity of the work sites would be affected by construction noise impacts. Appropriate mitigation measures would be required. The laying of WIS may be overlapped with some construction activities for WISSPS. However, trenchless method would be adopted, no construction noise impact from laying of WIS would be expected at the nearby NSRs. Except laying of WIS, no other concurrent project would be undertaken within 300m from this Project boundary, cumulative construction noise impact is therefore not anticipated. Detailed construction noise impact assessment is provided in **Appendix B**.

Water Quality

- 3.6 Potential water quality concerns during construction phase would be site runoff and sewage generated from construction workforce. With the implementation of good site practices and recommended mitigation measures in Section 5, adverse water quality impact during the construction phase is not anticipated.

Wastes Management

- 3.7 Wastes generated by the construction works are likely to be excavated materials, concrete, metal scraps and packaging materials. With the implementation of good construction site management practice, the impact would be minimal. A small amount of chemical wastes from the



maintenance of plant/powered mechanical equipment is also expected. It is anticipated that about 15,710 m³ of Construction and Demolition (C&D) materials would be generated. 15,500 m³ of C&D materials (of which 13,950 m³ is soil and 1,600 m³ is concrete/rock) would be transported to other public filling areas. The volume of C&D materials to be disposed at landfill would be 210m³. Provided that the chemical waste is handled and disposed of in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Waste, adverse environmental impacts would not be anticipated. Insignificant amount of general refuse to be generated from construction workforces is expected in view of limited construction activities.

Ecology

- 3.8 The proposed sewage pumping station is located at roadside. The site is not surrounded by areas of ecological value (e.g. woodland and natural stream). No adverse ecological impact is expected.

Landscape and Visual

- 3.9 This section addresses the possible impact on the LVIA sensitive receivers. Assessment of landscape and visual impact of the proposed structure will be made according to the LVIA study area defined in **Appendix A**.
- 3.10 The proposed WIS SPS is mainly enclosed by 3 flyovers in such a way that no significant visual impact on the surrounding communities, such as Nam Fung Industrial City, Hoh Fuk Tong Primary School, Lung Mun Oasis and Road Travelers along Lung Fu Road, is identified. (See **Appendix G** for the study results of the surrounding communities). Therefore, the sensitive receiver for LVIA aspect mainly consists of users of cycling/pedestrian path, amenity area/ open space, as well as amenity landscape character area.
- 3.11 The locations of the landscape resources (LR) and visual sensitive receiver (VSR) in the vicinity of proposed WISSPS are shown in **Figure 3.1**.

LR1- Existing Trees

- 3.12 This LR refers to the existing trees found within the site area of the proposed WISSPS. Based on the Tree Survey, a number of trees will be affected due to the proposed works. Tree Assessment Schedule is enclosed in **Appendix C** for reference. No endangered species or Registered Old and Valuable Trees (OVT) is identified within the project site. Majority of the affected trees are Cassia siamea. Most existing trees have a height of 5m-8m and with a crown spread of 2m -4m. Most trees are low in amenity value. The landscape resources have a medium landscape value and sensitivity to change.

LR2- Cycling / Pedestrian Path

- 3.13 This LR refers to the existing cycling and pedestrian network within the site area of proposed WISSPS. The pedestrian and cycling path are regularly used to link east and south bank of Tuen Mun River and its neighboring vicinity. The landscape resource has a medium landscape value and sensitivity to change.
- 3.14 The proposed WISSPS will conflicts with the existing alignment of pedestrian and cycling path. The cycling and pedestrian path will realign as a result of the proposed work. The magnitude of change is slight. This LR is predicted to have a moderate adverse landscape impact before mitigation measures during construction phase.
- 3.15 During construction phase, the cycling path will be diverted and re-provided. Mitigation measures during construction stage will aim to reduce disturbance to users and cyclists. This LR is predicted to have slight adverse landscape impact after mitigation measures during construction phase.



LR3- Amenity Area/ Open Space

- 3.16 This LR refers to the existing open space within the site area. This area is classified as Residential (A) under the Outline Zoning Plan. The open space provides a comfortable landscape setting with a variety of planting and landscaping elements. The size of the open space is around 2400m². This Landscape Resource has a medium landscape value and sensitivity to change.
- 3.17 The proposed WISSPS will lead to a permanent loss of the amenity area/open space. The magnitude of change is intermediate. During construction phase, the functionality of the amenity area/ open space will be terminated as the area will become inaccessible to users.
- 3.18 This LR is predicted to have a moderate adverse landscape impact after mitigation measures during construction phase.

LCA-1 Amenity Landscape Character Area

- 3.19 This Landscape Character Area (LCA) refers to the existing Amenity Landscape Character Area within the site area of WISSPS. The area possessed a number of Landscape Resources such as existing vegetation, cycling and pedestrian network and open space, which all contributed to existing park-like character. The amenity area provides a relax setting while the cycling and pedestrian network added a sense of dynamic and movement. With no distinctive entrance and boundary, the overall character is informal. The sensitivity to change is medium.
- 3.20 The proposed WISSPS have a substantial impact on the landscape character area before application of mitigation measures. During construction phase, the landscape character is substantially impacted as the construction of SPS will result in temporary landscape impact such as road diversion and construction traffic.
- 3.21 Mitigation measures such as design of hoarding to match with surrounding landscape and site supervision are proposed during the construction phase. The proposed WISSPS is predicted to have a moderate impact on the landscape character area after application of mitigation measures.

VSR

- 3.22 The sensitive receivers in the vicinity of the proposed WISSPS mainly consist of users of cycling/pedestrian path, amenity area/ open space, as well as amenity landscape character area.
- 3.23 During construction phase, temporary visual impact may arise from construction of WISSPS. Temporary structures such as barriers and enclosures, night-time lighting and stockpiling of excavated and building materials are predicted to have an adverse impact in a visual point of view. VSRs are predicted to have moderate visual impact before mitigation measures.
- 3.24 Mitigation measures will be proposed to minimize the visual impact during the construction phase. Mitigation measures such as design of hoarding to match with surrounding landscape and minimization of light pollution and night time glaring is proposed to mitigate the predicted visual impact. VSRs are predicted to have slight visual impact after mitigation measures.
- 3.25 Existing and expected view conditions of the project site are shown in **Appendix D**.

Cultural Heritage

- 3.26 Since there are no historical monuments or buildings identified within the study area of the proposed sewage pumping station, therefore, there is no cultural heritage impact during the construction phase of the Project.



Operation Phase

Air Quality

- 3.27 Operation phase air quality impact arising from the Project would be odour emissions from the proposed sewage pumping station. The coarse screen house and wet well would be the sources of odour nuisance. Potential odour impact would be expected at the nearby ASRs of the Project without mitigation measures.
- 3.28 Within 500m study area of WISSPS, there is no other odour emission source, therefore no cumulative odour impact is expected.

Noise

- 3.29 Fixed plant noise impact from the pump sets, screening facilities, transformers and ventilation facilities would likely be a concern to the noise sensitive receivers in the vicinity of the proposed pumping station. However, the pump sets, screening facilities and transformers would all be housed within the reinforced concrete structure with acoustic louvers and there should be no direct line of sight to the nearby NSRs. The pump sets and screening facilities would be located at the basement level. No adverse fixed plant noise impact would be expected at the nearby NSRs of the Project. Detailed operation noise impact assessment is provided in **Appendix B**.

Water Quality

- 3.30 Under normal operation, the Project will enhance the water quality of the surrounding environment. Under emergency situation, such as prolonged power failure, the sewage may be discharged into the nearby storm drains/water receiving body. The emergency bypass of WISSPS will be discharged to the two existing cell box culvert. The connection point for the discharge is located within the proposed lot.
- 3.31 However, with the implementation of appropriate preventing measures including stand-by pump, emergency power supply and telemetry system, the possibility of emergency bypass will be extremely remote.

Waste Management

- 3.32 Wastes generated during the operation phase would be a small amount of screenings and domestic wastes. The screenings would be properly packed and handled within the pumping station structure to avoid odour and hygienic nuisance. The screenings will then be transported to strategic landfills for disposal. No adverse waste impact is expected to result during the operational phase of the Project.

Ecology

- 3.33 Adverse ecological impacts are not expected during the operation of the proposed sewage pumping station.

Landscape and Visual

LR 1

- 3.34 No major landscape impact is expected due to the low amenity value of affected trees.

LR 2

- 3.35 The functionality of the pedestrian and cycling paths will be resumed during operation phase. The realigned pedestrian and cycling network will connect to the existing network. Residual impact is predicted to be insubstantial during operation phase.



LR 3

- 3.36 During operation phase, the WISSPS will provide greenery (green roof and new planting) and blend in with surrounding environment. Residual impact is predicted to be slight during operation phase.

LCA 1

- 3.37 During operation phase, the landscape character is moderately impacted. Despite the loss of open space, proposed WISSPS will apply a series of mitigation measures to mitigate the impact on the landscape character. The residual impact after mitigation measures will be slight.

VSR

- 3.38 During operation phase, main visual impact is predicted to be the scale and the outlook of the WISSPS and residual impact from the loss of trees during construction phase. Since the proposed WISSPS is enclosed by 3 flyovers, no significant visual impact on the surrounding communities, such as Nam Fung Industrial City, Hoh Fuk Tong Primary School, Lung Mun Oasis and Road Travelers along Lung Fu Road, is anticipated. Mitigations have been proposed to address the visual impacts to sensitive receivers in the vicinity of the proposed WISSPS which mainly consist of users of cycling/pedestrian path, amenity area/ open space, as well as amenity landscape character area

- 3.39 Careful aesthetic design of the WISSPS, along with a number of various mitigation measures are proposed. The form and the building facade is designed to create visual interest and reduce the perceived visual bulkiness of the structure. A number of claddings will be used to achieve the contemporary outlook. Green roof and wall planter is proposed to mitigate its visual impact and soften building edges. Screen planting is proposed to screen the building and sections. Proposed tree planting and bamboo planting at frontage is predicted to offset the impact to the landscape resources during the operation phase. VSRs are predicted to have slight adverse visual impact after mitigation measures. It is considered that the landscape and visual impact in the operation phase are acceptable with proposed mitigation measures.

Cultural Heritage

- 3.40 Since there are no historical monuments or buildings identified within the study area of the proposed sewage pumping station, therefore, there is no cultural heritage impact during the operation phase of the Project.



4. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

- 4.1 The proposed WISSPS is located next to Light Rail Transit at Tsing Shan Tsuen and nearby areas are educational institutions, residential developments and industrial buildings. The identified nearest existing and planned air and noise sensitive receivers in the vicinity of the proposed sewage pumping station are summarized in **Table 4.1**, and their locations are indicated in **Figure 4.1**.

Table 4.1 Air and Noise Sensitive Receivers in the vicinity of Western Interceptor Sewer Sewage Pumping Station

I.D.	Sensitive Receiver	Land Use	Noise Planning Daytime/Evening/Night time Criteria (dB(A))	Construction Noise Criteria dB(A)	Nearest Distance to the boundary of SPS (m)
NIC*	Nam Fung Industrial City	Industrial	-	-	93
TST	Tsing Shan Tsuen	Residential	60/60/50	75	295
YC2	Yau Chai Hospital No. 2 Secondary School	Educational Institute	60/60/50	70 (normal teaching hour) 65 (examination)	193
JCC	Ju Ching Chu Secondary School	Educational Institute	60/60/50	70 (normal teaching hour) 65 (examination)	83
WYH	ICAC Training Camp	Residential	60/60/50	75	81
MHS	Morninghill School	Educational Institute	60/60/50	70 (normal teaching hour) 65 (examination)	136
HFT	Hoh Fuk Tong Primary School	Educational Institute	60/60/50	70 (normal teaching hour) 65 (examination)	114
LMO	Lung Mun Oasis	Residential	60/60/50	75	170
PRD	Proposed Residential Development at Tuen Mun Area 18 (An indicative point)	Residential (Planned)	60/60/50	75	61

Note: * NIC is an air sensitive receiver only.



5. ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED IN THE DESIGN AND FURTHER ENVIRONMENTAL IMPLICATIONS

Construction Phase

Air Quality

- 5.1 Construction dust would not be an issue with the implementation of proper dust control and suppression measures as stipulated in the Air Pollution Control (Construction Dust) Regulation. Water spraying on the exposed sandfill area and during excavation should be applied.

Noise

- 5.2 With the application of mitigation in the form of quieter PMEs and reduction of number of operated PMEs, construction noise levels predicted at the nearest noise sensitive receivers would normally comply with the construction noise criteria. The detailed construction noise impact assessment for mitigated scenario is presented in **Appendix B**.

Water Quality

- 5.3 During construction phase of the Project, the practices outlined in ProPECC PN1/94 Construction for Drainage as well as other good site management practices to avoid site runoff and minimize the potential water pollution will be implemented. All site construction runoff should be controlled and silt removal facilities incorporated to prevent high levels of suspended solids entering the drainage network. Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be removed regularly, at the onset of and after each rainstorm. Earthworks final surfaces should be well compacted and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided (e.g. along the crest / edge of excavation) where necessary. The contractors should be required under the contract specification to ensure that site management is optimised and that the deposit of any solid materials, litter or wastes does not occur in drainage channels or surface waters.

Waste Management Implications

- 5.4 To minimize generation waste and C&D materials, standard waste management measures and good site practices in waste handling, disposal and transportation will be implemented. The contractor will be required to sort all C&D materials and waste into different categories for reuse on site, recycling and disposal at designated public fill reception facilities or landfills. Disposal of C&D materials will be managed through the trip-ticket system as stipulated in ETWB TCW No. 31/2004. All chemical wastes from equipment maintenance will be handled, stored and disposed of in accordance with the requirements of the Waste Disposal (Chemical Waste) Regulation. General refuse should be stored and disposed of separately from general construction waste and chemical waste. The storage bins for general refuse would be provided with lids, which should be kept closed to avoid odour nuisance and wind blown litter. The general refuse would be removed regularly and disposed of to licensed landfills, no adverse impact related to handling and disposal of general refuse is expected.

Landscape and Visual

- 5.5 This section mainly addresses the environmental measures to be incorporated in the design and future environmental implications.

The following mitigation measures, in addition to the incorporation of requirements of DSD *Guidelines on Aesthetic Design of Pumping Station Buildings* in the design, should be implemented in the construction phase:



- Site hoarding to compatible with the surrounding environment
 - Control of night time lighting
 - Site supervision to minimize disturbance to pedestrian and cyclists during construction phase.
- 5.6 The possible adverse Landscape impact is moderate during construction phase and the nature of the impact is temporary/ short term in nature. Except the Amenity Landscape/ open space, which will be permanently lost and therefore have a long term impact. No transboundary impact is expected. With the implementation of mitigation measures, adverse impact is predicted to be slight during construction phase.
- 5.7 The possible adverse Visual impact is moderate during construction phase and the nature of the impact is temporary/ short term in nature. With the implementation of mitigation measures, adverse impact to key VSRs is predicted to be slight during construction phase.

Operation Phase

Air Quality

- 5.8 To minimize potential odour impact during operation phase of the Project, the coarse screen house and wet well will be enclosed. A deodorizer with a forced ventilation system will also be installed to remove odour being discharged into open air. As adopted in other existing similar sewage pumping stations, e.g. Nam San Wai Sewage Pumping Station, the removal efficiency of H₂S by the proposed deodorizer to be installed will be 99.5%. In worker accessible areas (coarse screen areas, both upper and lower floors), a ventilation rate between 12 to 15 air changes/hr (ACH) will be used for odour extraction. For the non-worker accessible areas (wet wells), a ventilation rate between 3 and 6 ACH will be adopted. The odour control approach is to directly extract odorous gases from an enclosed area to a deodorizing unit for treatment before venting to the outside atmosphere. The exhaust of the deodorizer would be located in a direction away from the sensitive receivers as far as practicable (The exhaust location refers to **Appendix E**). Given that a negative pressure is maintained in the aforementioned area and the deodorizing facility is properly maintained and functioning, it is anticipated that potential odour impacts would be mitigated. During normal operation, the screening wastes will be removed regularly from the pumping station. To avoid odour nuisance, the screenings will be properly packed and handled within the pumping station and the screening wastes will be covered during transporting process (transported to designated landfill for disposal).

Noise Impact

- 5.9 To minimize potential operational noise impacts from the pump sets, screening facilities and transformer, these facilities would be located inside the proposed sewage pumping station (reinforced concrete structure) with acoustic louvers and there is no direct line of sight to the nearby NSRs. In addition, the pump sets and screening facilities would be located at the basement level of the pumping station. Silencers would also be provided for the exhaust fans. Detailed operation noise impact assessment is presented in **Appendix B**. Results indicated that the predicted noise levels at the nearest NSRs in the vicinity of the proposed sewage pumping station would comply with the daytime, evening and nighttime noise criteria.

Water Quality

- 5.10 To minimize the probability of sewage overflow and surcharge to upstream sewerage system due to power and equipment failure, mitigation measures such as stand-by pump, emergency power supply and telemetry system will be incorporated. Emergency overflow to existing box culvert will also be provided. During operation, two duty and one standby pumps will be provided to cater for breakdown and maintenance of the duty pumps. If the facility is unmanned, a telemetry system will also be provided in order to transmit signals showing irregularity or any operational problem



for the SPS to the existing Pillar Point Sewage Treatment Works such that immediate actions can be taken. 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. Besides, manually cleaned screens should be provided at the overflow bypass to prevent the discharge of floating solids into receiving water.

- 5.11 In case of an emergency overflow, which is extremely rare due to comprehensive overflow preventive measures, Pillar Point Sewage Treatment Works will be alerted by telemetry system in the SPS. During this time, overflowing sewage will be diverted to emergency bypass to existing storm drain through an automated system. DSD's Sewage Treatment Works staff will also be notified and arrive at SPS to carry out maintenance work. As soon as corrective maintenance is completed, sewage bypass will be terminated and normally SPS operation resumed.

Waste Management Implications

- 5.12 The screenings of the sewage should be properly packed in plastic bags. This operation should be conducted inside the sewage pumping station. The screenings should then be transported to landfill site for disposal. Therefore, no adverse waste impact is anticipated.

Landscape and Visual

- 5.13 The following mitigation measures, in addition to the incorporation of requirements of DSD *Guidelines on Aesthetic Design of Pumping Station Buildings* in the design, should be implemented in the operation phase,

- Good building form and facade
- Aesthetic design of WISSPS structure such as use of materials, architectural form and colour (Refer to **Appendix F**)
- Provision of greenery-green roof and wall planter
- Tree Planting and Bamboo Planting
- Re-instatement of excavated area to former condition or better
- Gate design matching surrounding planting area and due consideration has been given in designing the height and colour of the gate in order to screen out visual sight from outsiders

- 5.14 The possible Landscape impact is slight during operation phase and the nature of the impact is temporary/ short term in nature given the proposed mitigation measures. The WISSPS is expected to gradually blend in with the surrounding environment. With the implementation of mitigation measures, no major adverse impact is predicted during operation phase.

- 5.15 The possible Visual impact is slight during operation phase and the nature of the impact is temporary/ short term in nature. The Project is considered small in terms of scale and possible Visual impact is confined within a local area. With mitigation measures designed to visually mitigate the building, the WISSPS is expected to have minimal visual impact to surrounding environment. With the implementation of mitigation measures, no adverse impact to key VSRs is predicted during operation phase.

- 5.16 The landscape plan for WISSPS is attached in **Appendix E**.



6. SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

6.1 The potential environmental impacts and proposed mitigation measures to be incorporated into the design and construction of the proposed pumping stations are summarized in **Table 6.1** below: -

Table 6.1 Summary of Potential Environmental Impacts and Mitigation Measures

Project Stage / Location	Potential Environmental Impact	Mitigation Measure	Implementation Agent	Relevant Section in the Project Profile
Construction / Construction Site	Minor dust nuisance	(1) Adopt dust control and suppression measures as stipulated in the Air Pollution Control (Construction Dust) Regulation (2) Water spraying on exposed sandfill area and during excavation	Contractor	5.1
Construction / Construction Site	Minor noise impact	(1) Use of quiet plant (2) Reduction in number of some noisy powered mechanical equipment during examination period of NSR JCC	Contractor	5.2 and Appendix B
Construction / Construction Site	Water quality impact	(1) Control of construction surface run-off according to ProPECC PN 1/94, EPD's Practice Note for Professional Persons, Construction Site Drainage (2) Control by contract specification	Contractor	5.3
Construction / Construction Site	Minor waste impact	(1) Standard waste management measures and good site practices in waste handling, disposal and transportation will be implemented (2) The contractor will be required to sort all C&D materials and waste into different categories for reuse on site, recycling and disposal at designated public fill reception facilities or landfills. Disposal of C&D materials will be managed through the trip-ticket system as stipulated in ETWB TCW No. 31/2004 (3) All chemical wastes from equipment maintenance will be handled, stored and disposed of in accordance with the requirements of the Waste Disposal (Chemical Waste) Regulation. (4) General refuse should be stored and disposed of separately from general construction waste and chemical waste. The storage bins for general refuse would be provided with lids, which should be kept closed to avoid odour nuisance and wind blown litter. The general refuse would be removed regularly and disposed of to licensed landfills	Contractor	5.4



Project Stage / Location	Potential Environmental Impact	Mitigation Measure	Implementation Agent	Relevant Section in the Project Profile
Construction/ Construction Site	Minor landscape and visual impact	(1) Site hoardings compatible with the surrounding environment (2) Control night time lighting (3) Site supervision to minimize disturbance to pedestrian and cyclists	Contractor	5.5
Operation / SPS	Odour nuisance	(1) All odour sources will be enclosed (2) Deodourizer will be installed to remove odour and the exhaust will be located as far from the ASRs as possible. The removal efficiency of H ₂ S by the proposed deodourizer to be installed will be 99.5% (3) The screenings will be properly packed and handled within the pumping station structure to avoid odour nuisance. The screenings will then be transported to designated landfills for disposal. The screenings will be covered during transportation process	DSD	5.8
Operation / SPS	Noise impact	(1) Pump sets and screening facilities will be inside the substructure (200mm thick reinforced concrete structure) of the SPS (2) Transformer will be housed in a 200mm thick reinforced concrete structure (3) The SPS will be provided with acoustic louvers. (4) Silencers will be provided for the exhaust fans.	DSD	5.9 and Appendix B
Operation / SPS	Water quality	No impact during normal operation. Measures to minimize abnormal situations and the possibility of sewage bypass : (1) Standby pump will be provided (2) emergency power supply will be provided (3) Telemetry system will be applied for monitoring the operation of SPS	DSD	5.10 and 5.11
Operation / SPS	Waste generation	(1) Screenings will be enclosed and disposed to landfill site	DSD	5.12
Operation / SPS	Landscape and visual impact	(1) Building form and materials used to create visual interest and reduced perceived size of structure. (2) Aesthetic design of the proposed WISSPS. Green-roof and wall planting to provide greenery and match with existing character. (3) Screen planting will be provided around the SPS as screening effect to mitigate landscape and visual impact (4) Gate design will match the surrounding planting area.	DSD	5.13



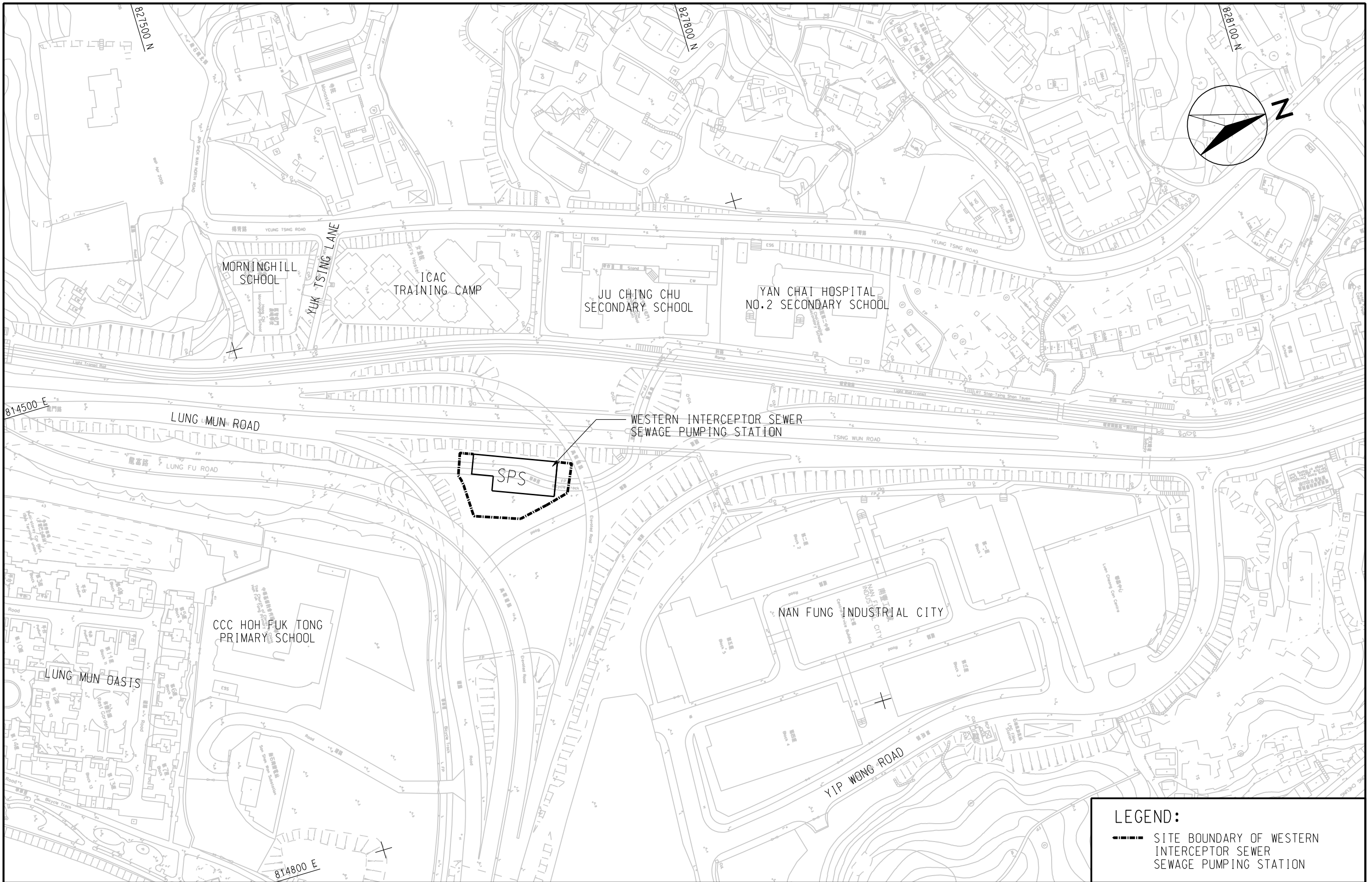
7. USE OF PREVIOUSLY APPROVED EIA REPORTS

7.1 The successful cases of similar nature and scale of designated projects for direct application of EP are summarised as follows:

Table 7.1 Previous Direct Application for Environmental Permit for Sewage Pumping Station

EIAO Reference	Designated Project Title	Pumping Station Capacity (ADWF)	Closest Sensitive Receiver
DIR-020/1999	Sewage Pumping Station at Tung Tau Industrial Area (for PWP Item No. 278CL – Kau Hui Development Phase I, Engineering Works, Area 16, Yuen Long)	5,260 m ³ /day	35 m
DIR-024/1999	Yuen Long South Sewage Pumping Station (as part of PWP Item No. 4157DS – Yuen Long and Kam Tin Sewerage, Stage II, Phase 2 – Yuen Long South Pumping Station, Rising Main to Castle Peak Road and Sewers)	36,900 m ³ /day	75 m
DIR-040/2000	PWP Item No. 4274DS – Yuen Long and Kam Tin Sewerage Stage III – Au Tau Sewage Pumping Station	12,200 m ³ /day	80 m
DIR-057/2001	Sai Kung Area 4 Sewage Pumping Station	7,500 m ³ /day	34 m
DIR-067/2002	Lam Tsuen Valley Sewage Pumping Station under Lam Tsuen Valley Sewerage Project	5,600 m ³ /day	150 m
DIR-138/2006	PWP ITEM No. 4338DS – Improvement and Upgrading of the Sewerage Systems in Sha Tin / Ma On Shan New Town – Ma On Shan Area 108 Pumping Station	14,500 m ³ /day	75 m
DIR-140/2006	Agreement No. CE67/94 Tsing Kau and Sham Tseng Sewerage Scheme Sewage Treatment and Disposal Facilities – Tsing Lung Tau Pumping Station	4,000 m ³ /day	25 m
DIR-161/2007	Tai Po Tai Wo Road Sewage Pumping Station	12,100 m ³ /day	29 m
DIR-168/2008	Sewage Interception Scheme in Kowloon City – Sewage Pumping Stations	SPS No.1: 60,480 m ³ /day SPS No.2: 64,800 m ³ /day	SPS No.1:21 m SPS No.2:10 m

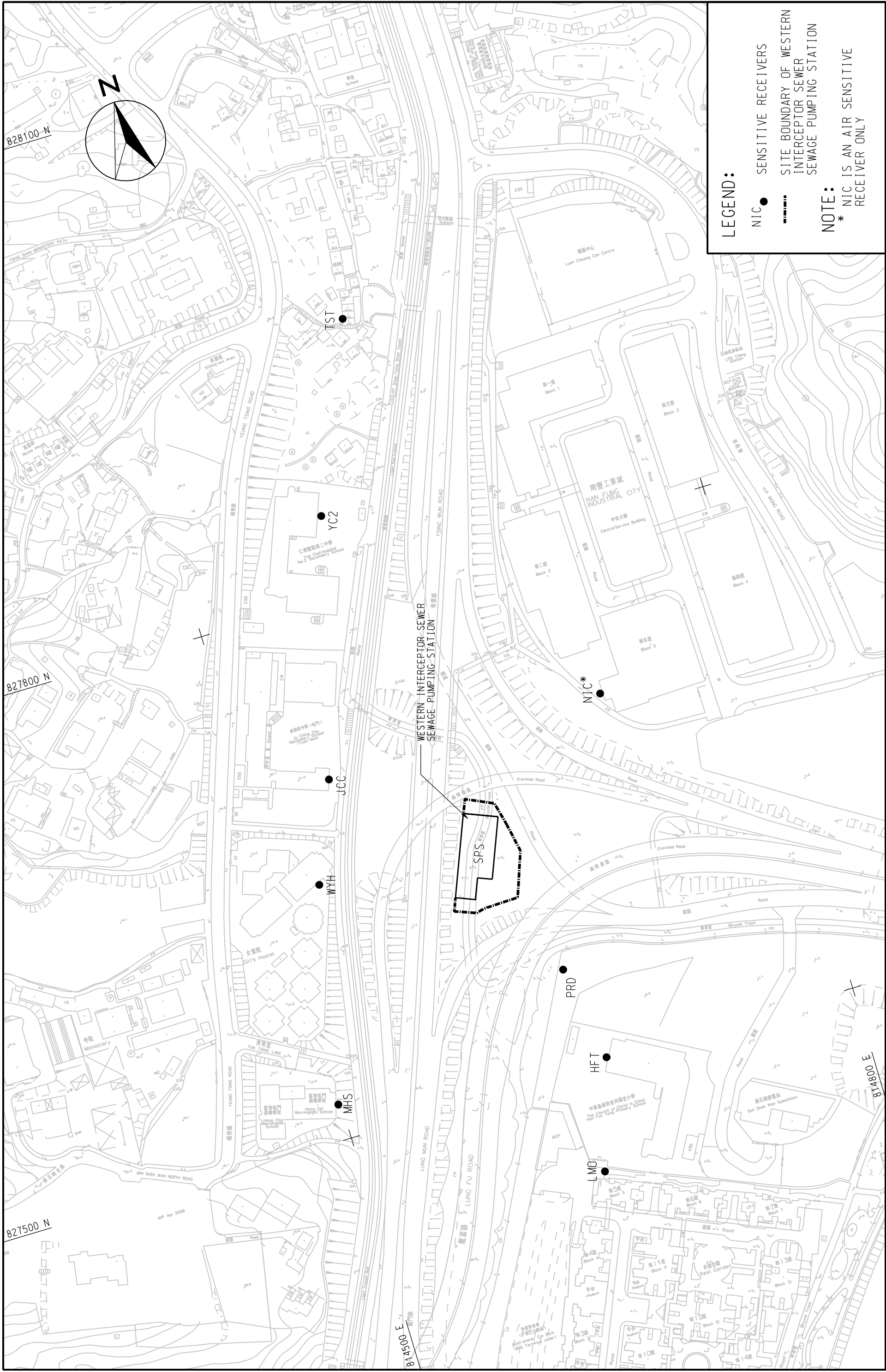
FIGURES



LEGEND:
 - - - - SITE BOUNDARY OF WESTERN INTERCEPTOR SEWER SEWAGE PUMPING STATION

SCALE	A3 1:2000	DATE	APR. 08
CHECK	-	DRAWN	WDF
JOB No.	60023165	DRAWING No.	FIG 1.1
		REV	-





LEGEND:

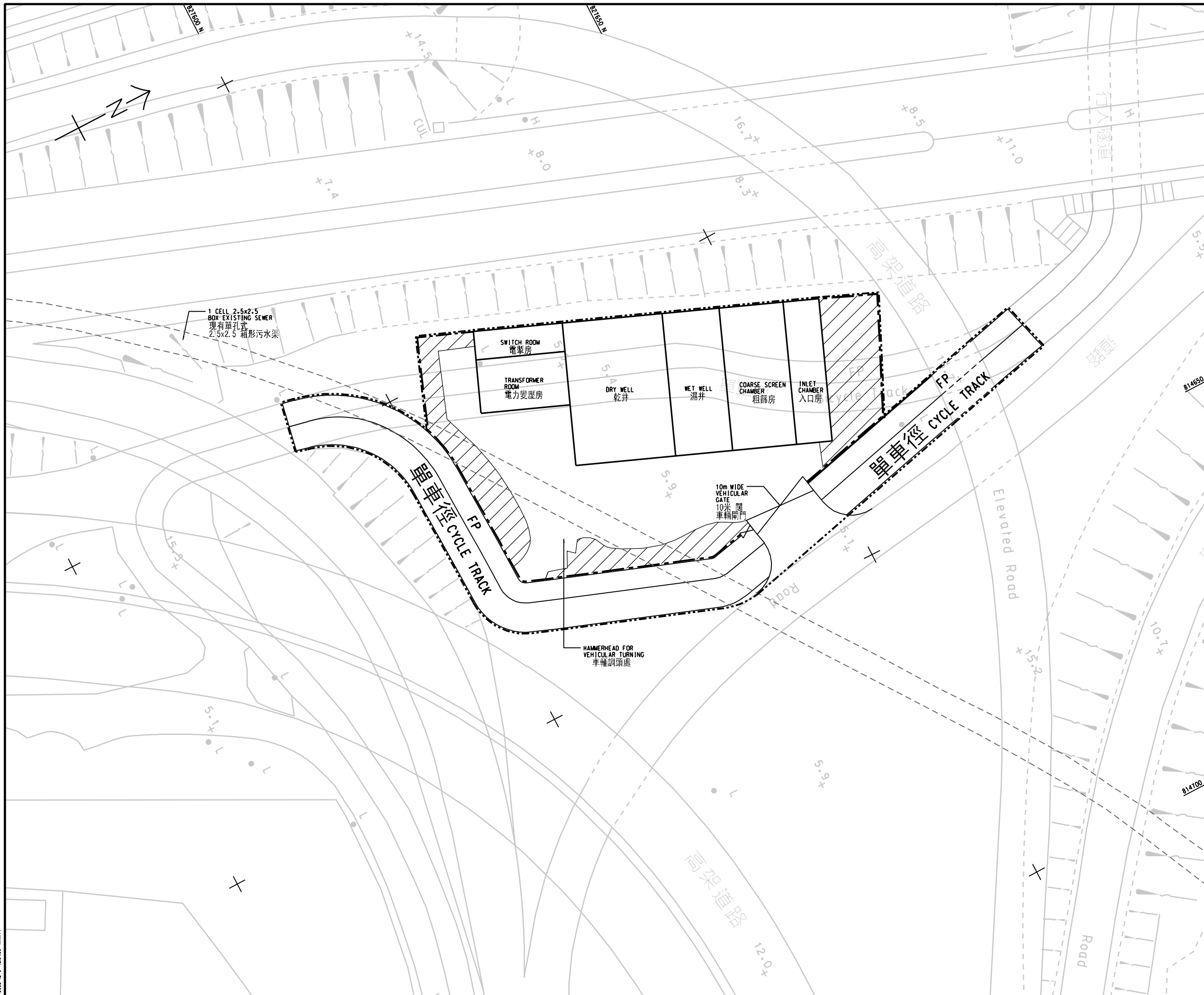
- NIC ● SENSITIVE RECEIVERS
- SITE BOUNDARY OF WESTERN INTERCEPTOR SEWER
- SEWAGE PUMPING STATION

NOTE:

* NIC IS AN AIR SENSITIVE RECEIVER ONLY

MAUNSELL AECOM		AGREEMENT NO. CE 38/2006 (DS)	
Maunsell Consultants Asia Ltd		TUEN MUN SEWERAGE - INVESTIGATION, DESIGN AND CONSTRUCTION	
LOCATIONS OF AIR AND NOISE SENSITIVE RECEIVERS IN THE VICINITY OF WESTERN INTERCEPTOR SEWER PUMPING STATION			
SCALE	A3 1:2000	DATE	APR. 08
CHECK	-	DRAWN	WDF
JOB NO.	60023165	DRAWING NO.	FIG 4.1
		REV	-

**APPENDIX A
LAYOUT PLAN OF SEWAGE PUMPING
STATION**



LEGEND:
圖例:

	BOUNDARY WALL 邊界牆
	PERSONNEL GATE 行人閘門
	VEHICULAR GATE 車輛閘門
	EXISTING BOX CULVERT 現有箱形暗渠
	PLANTING AREA 種植範圍
	STUDY AREA OF LVIA 景觀及視覺影響的研究範圍

NO.	DESCRIPTION	DATE	BY	CHECKED	DATE
渠務署 Drainage Services Department					
工務計劃工程編號 4346DS 屯門污水收集系統改善工程 - 第一階段					
WESTERN INTERCEPTOR SEWER SEWAGE PUMPING STATION - LAYOUT PLAN 西部主幹污水泵房圖則					
MAUNSELL AECOM Maunsell - Metcalf & Eddy Joint Venture 茂盛 - 茂迪顧問聯營公司					
DRGNO. 圖紙編號		SK 3001			
DESIGNED BY	DESIGNED BY	CHECKED BY	DATE	APPROVED BY	DATE
SCALE	A3 1 : 500		圖紙比例 1 : 500		
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**APPENDIX B
CONSTRUCTION NOISE AND OPERATION
NOISE IMPACT ASSESSMENT**

APPENDIX B CONSTRUCTION NOISE AND OPERATION NOISE IMPACT ASSESSMENT

1. Introduction

1.1 This section presents an assessment of potential noise impact from the construction and operation of the Project to the nearby sensitive receivers in the vicinity of the proposed sites. Appropriate mitigation measures have been recommended, where necessary, to alleviate the potential noise impacts to acceptable levels.

2. Environmental Legislation, Policies, Plans, Standards and Criteria

2.1 Noise impacts were assessed in accordance with the criteria and methodology given in the Technical Memoranda made under the Noise Control Ordinance (NCO).

2.2 The Noise Control Ordinance (NCO) provides the statutory framework for noise control. The NCO invokes the following four Technical Memoranda, which define the technical means for noise assessment:

- ♦ Technical Memorandum on Noise from Places other than Domestic Premises, Public Places or Construction Sites (IND-TM);
- ♦ Technical Memorandum on Noise from Construction Work in Designated Areas (DA-TM);
- ♦ Technical Memorandum on Noise from Construction Work other than Percussive Piling (GW-TM); and
- ♦ Technical Memorandum on Noise from Percussive Piling (PP-TM).

2.3 The NCO and the accompanying Technical Memoranda provide a mechanism for assessing noise levels and the statutory power to control noise.

2.4 With regard to the assessment of the operational noise impacts, the NCO designates acceptable noise levels for Noise Sensitive Receivers (NSRs) on the basis of an Area Sensitivity Rating (ASR), based on the characteristics of the area within which they are located such as rural, village, low-density residential, or urban. Within these areas, the presence of "influencing factors" (such as the presence of industrial activities or major roads) can further affect the ASR and therefore the acceptable noise level (see **Table 1**).

Table 1: Area Sensitivity Ratings

Type of Area Containing NSR	Degree to which NSR is affected by Influencing Factor		
	Not Affected	Indirectly Affected	Directly Affected
Rural Area	A	B	B
Urban Area	B	C	C
Low density residential area consisting of low-rise or isolated high-rise developments	A	B	C
Area other than those above	B	B	C

Construction Phase

- 2.5 Under the GW-TM, noise from construction activity is not restricted during the period 0700 - 1900 hours on weekdays, except Public Holidays. However, the EIAO-TM identifies a daytime general construction noise limit of 75 dB(A) Leq_(30 minutes) for domestic premises and 70 dB(A) Leq_(30 minutes) for educational institutes during normal teaching hours (65 dB(A) Leq_(30 minutes) during examination hours). This standard has been used as an assessment criterion in the construction noise assessment.

Operation Phase

- 2.6 Operational noise emitted from the proposed pumping station is controlled under the IND-TM. According to the IND-TM, the acceptable Noise Levels (ANLs) for different Area Sensitivity Rating are given in **Table 2**. The ANL is a function of the type of area within which the NSR is located, and the degree of the effect on the NSR of influencing factors such as major roads and industrial areas. The ANLs for all ASRs are provided in Table 2.

Table 2: Acceptable Noise Levels (ANLs) (dB(A))

Time Period	ASR A	ASR B	ASR C
Day (0700 to 1900 hours)	60	65	70
Evening (1900 to 2300 hours)			
Night (2300 to 0700 hours)	50	55	60

- 2.7 When assessed in accordance with the IND-TM, the level of the intruding noise at the facade of the nearest sensitive use should be at least 5 dB(A) below the appropriate ANL shown in

Table 2 of the IND-TM or, in the case of the background being 5 dB(A) lower than the ANL, the predicted noise level should not exceed the background.

- 2.8 The assessment area containing NSRs at WISSPS are not considered as urban or rural area. The study area includes high rise and low rise residential developments, educational institutes and commercial/industrial buildings. The study area is therefore considered as “Area other than those above” stipulated in Table 1. The NSRs in the vicinity of WISSPS are located near busy roads such as Lung Mun Road and Lung Fu Road and industrial areas (such as Nan Fung Industrial City). It is anticipated that the NSRs may or may not be indirectly affected by industrial noise. The study area at WISSPS is therefore defined as ASR “B”. In accordance with Table 2, the ANL for the sensitive receivers in the vicinity of WISSPS would be 65 dB(A) in the daytime/evening and 55 dB(A) at night.
- 2.9 The background noise levels in the study area were higher than ANL - 5 dB(A). The adopted operational noise criteria in the assessment are summarized in **Table 4**.

Table 4: Noise Criteria for Operational Noise Levels (dB(A))

Time Period	Adopted Noise Criteria dB(A)
Day (0700 to 1900 hours)	60
Evening (1900 to 2300 hours)	
Night (2300 to 0700 hours)	50

- 2.10 In any event, the ASR assumed in this assessment is for indicative assessment only. It should be noted that fixed noise sources are controlled under section 13 of the NCO. Nothing in this assessment shall bind the Noise Control Authority in assessing noise from these sources upon the receipt of complaints. The Authority shall assess the noise impacts based on the contemporary conditions / situations.

3. Assessment Methodology

Construction Phase

- 3.1 The assessment followed the procedures given in the GW-TM. For the assessment of noise from PME, the distance attenuation was estimated using the standard formula:

$$\text{Distance Attenuation in dB(A)} = 20 \log D + 8 \quad [\text{where } D \text{ is the distance in meters}]$$

- 3.2 Sound Power Levels of the equipment were taken from BS5228: Part 1:1997 and Table 3 of the GW-TM. Groups of equipment likely to be employed for each construction task are shown in **Annex 1A**. The equipment lists are considered realistic and practicable. All works would be carried out in the non-restricted hours (0700-1900 hours).
- 3.3 As the E&M works are mainly installation work, limited number of PME would be used. Also most of the E&M works would be carried out indoors. Thus it is considered that the E&M works would not contribute to the cumulative impact at the NSRs.
- 3.4 Due to the limited space of the Project sites, parallel construction tasks with grouping of PME as listed in Annex 1A is considered not practical. The construction tasks as listed in Annex 1A will only be carried out in sequence.
- 3.5 Noise impact was assessed on the basis of the following three conservative assumptions:
- ♦ All PME items required for a particular construction activity would be located at the notional source position, which was at a position mid-way between the appropriate geographical centre of the construction sites and its boundary nearest to the NSR;
 - ♦ A +3 dB(A) facade correction was added to the predicted noise levels to account for the facade effect at each NSR; and
 - ♦ Noise impacts at the nearest sensitive facades of the residential buildings to the source positions were assessed.
- 3.6 The laying of WIS may be overlapped with some construction activities for WISSPS. However, trenchless method would be adopted, no cumulative construction noise impact would be expected at the nearby NSRs. Other than the laying of WIS, there is no other concurrent project undertaken within 300m of the study area.

Operation Phase

- 3.7 The assessment followed the procedures given in the IND-TM. For the assessment of noise from equipment, the distance attenuation was estimated using the standard formula as mentioned above.
- 3.8 The estimated SWL of other equipment were taken with reference to the specifications of similar items of equipment provided by contractor/plant supplier and other similar projects. The pump sets, screening facilities and transformer will be located inside the proposed sewage pumping station (reinforced concrete structure) with acoustic louvers and there is no direct line of sight to the nearby NSRs. In addition, pump sets and screening facilities will be located at the basement level of the pumping station.
- 3.9 Noise impact was assessed on the basis of the following assumptions:
- ♦ All duty items are in operation together. For determining the distance correction factors, the distances between the probable source (pumps, mechanically raked fine screens

and transformer) positions and the NSRs were considered; while the exhaust fans were assumed to be located at the side of the SPS which was nearest to the NSR as conservative approach in the assessment;

- ♦ A +3 dB(A) facade correction was added to the predicted noise levels to account for the facade effect at each NSR;
- ♦ A +6 dB(A) tonality correction for exhaust fans, pumps and transformer was added to the predicted noise levels at each NSR; and
- ♦ Noise impacts at the nearest sensitive facades of the residential buildings to the source positions were assessed.

4. Noise Sensitive Receivers (NSRs)

4.1 Potential noise sensitive receivers (NSRs) have been identified in accordance with the criteria set out in the EIAO TM and through site inspection. The representative worst affected noise sensitive receivers are shown in **Table 4**. Locations of the NSRs are shown in **Figure 4.1**.

Table 4 NSR identified under this Project

NSR	Description	Type of Use	Approx. Distance from WISSPS Boundary (m)
WYH	ICAC Training Camp	Residential	81
JCC	Ju Ching Chu Secondary School	Educational Institute	83
PRD	Proposed Residential Development at Tuen Mun Area 18 (Assuming 5m from the site boundary)	Residential (Planned)	61

Note: NSR PRD to be affected by operational noise impact only.

5. Prediction and Evaluation of Environmental Impacts

Construction Phase

5.1 The predicted noise levels at representative NSRs are summarized in **Table 5**. Noise exceedances would be predicted at the representative residential NSRs during site clearance, excavation works and concreting works. Exceedance would also be predicted at educational NSR JCC during all types of construction activities. Noise mitigation measures would be required. The calculation is presented in **Annex 1B**.

Table 5 Predicted Noise Levels at Representative NSR (Unmitigated Scenario)

Activity	Predicted Noise Levels, dB(A)	
	WYH	JCC
Site Clearance and Setup Office	80	80
Excavation Works	80	79
Concrete Works	77	76
Miscellaneous Works	74	74
Criteria	75	70/65#

Note: # Criteria during examination period

Operation Phase

- 5.2 The plant inventory and the SWL are summarized in **Annex 2**. The plant inventory used for the prediction of operation noise impact is practical and realistic. To represent the worst-case scenario, all items of equipment were assumed to operate continuously 24 hours a day. The directivity was not included in the calculation.
- 5.3 Transformer that will be housed in the concrete structure with acoustic louvers was assumed to have 20 dB(A) reduction of noise emitted from the sources. The pump sets and mechanically raked fine screens that will be located underground and housed in the concrete structure without direct line of sight to the NSRs were also assumed to have 20 dB(A) attenuation in noise levels. Silencers will be provided for the exhaust fans and 10 dB(A) of noise attenuation was assumed.
- 5.4 The predicted maximum noise level at representative NSRs in the vicinity of WISSPS would be 42 dB(A). All representative NSRs would meet both the daytime/evening time and night-time criteria of 60 dB(A) and 50 dB(A) respectively. Therefore, no further mitigation measures would be required for the equipment. Details of the calculation are presented in **Annex 2**.

6. Mitigation of Potential Adverse Environmental Impacts

Construction Phase

Use of Quiet PME & Reduction of Number of Noisy PMEs

- 6.1 To reduce construction noise impacts from the SPS, silenced type of PMEs, which are in accordance with BS5228:Part 1:1997, are recommended. The total SWLs of PME for each of the construction activities were calculated and are summarized in **Annex 1C**. The equipment lists are considered realistic and practicable.
- 6.2 The construction noise levels at representative NSRs under the mitigated scenario are summarized in **Table 6** and detail calculation is presented in **Annex 1D**. With the noise

mitigation measures in place, the cumulative construction noise levels predicted at all representative residential NSRs would comply with the daytime noise criterion. The educational NSR JCC would also comply with noise criteria during normal teaching hours, however, noise exceedance of 3 – 5 dB(A) would still be predicted during examination period. It is proposed that the following noisy PME be not operated during examination to alleviate construction noise impact from WISSPS. The list of the PMEs to be adopted for this period and the calculation are presented in **Annex 1E** and **Annex 1F**, respectively.

- (1) Site Clearance – Breaker and Dump Truck;
- (2) Excavation Works – Breaker;
- (3) Concreting Work – Chipper, Saw, Mobile Crane, and 2 numbers of pokers;
- (4) Miscellaneous Works – Roller, Lorry and Mobile Crane.

Table 6 Predicted Noise Levels at Representative NSR (Mitigated Scenario)

Activity	Predicted Noise Levels, dB(A)	
	WYH	JCC
Site Clearance and Setup Office	69*	69*/65@
Excavation Works	69*	68*/65@
Concrete Works	71*	70*/65@
Miscellaneous Works	69*	69*/65@
Criteria	75	70/65#

Note: # Criteria during examination period

* Adoption of Quiet PMEs

@ Adoption of Quiet PMEs + Reduction of number of operated PME

Good Site Practice

6.3 In addition to the use of quiet PME, good site practices listed below should be adopted to further abate any residual impacts during the construction phase of the Project and should be included in the contract:

- ♦ Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction phase;
- ♦ Silencers or mufflers on construction equipment should be utilised, if found necessary, to further reduce noise, and should be properly maintained during the construction phase;
- ♦ Mobile plant should be sited as far away from NSRs as possible;
- ♦ Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum;
- ♦ Plant known to emit noise strongly in one direction, should, where possible, be orientated so that the noise is directed away from nearby NSRs; and

- ♦ Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities.

Operation Phase

- 6.4 In view of proper design of the SPS as mentioned in S 3.8, the assessment results indicated that the predicted levels at all representative NSRs would satisfy the criteria of the EIAO-TM and further mitigation measures would not be required.

7. Conclusions

Construction Phase

- 7.1 With the adoption of quiet PME and reduction of noisy PMEs, the predicted construction noise levels at representative NSRs would not exceed the relevant noise criteria.

Operation Phase

- 7.2 The noise impacts associated with the operation of the Project were also assessed. The assessment result indicated that the operation noise levels predicated at representative NSRs would comply with the daytime, evening time and night time criteria. Thus no adverse noise impact arising from the Project would be expected.

**Powered Mechanical Equipment (PME) for the Different
Construction Tasks during Normal Daytime Working Hours
(Unmitigated Scenario)**

(1) Site Clearance and Set Up Site Office

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Total SWL dB(A)
Breaker, excavator mounted (pneumatic)	CNP 027	1	122	100.0%	122.0
Excavator	CNP 081	1	112	100.0%	112.0
Dump Truck	CNP 067	1	117	100.0%	117.0
Air Compressor	CNP 003	1	104	100.0%	104.0
Bulldozer	CNP 030	1	115	100.0%	115.0
Generator	CNP 102	1	100	100.0%	100.0
Total					124.1

(2) Excavation Work

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Total SWL dB(A)
Dump Truck	CNP 067	1	117	100.0%	117.0
Excavator	CNP 081	1	112	100.0%	112.0
Generator	CNP 102	1	100	100.0%	100.0
Air Compressor	CNP 003	1	104	100.0%	104.0
Breaker, excavator mounted (pneumatic)	CNP 027	1	122	100.0%	122.0
Total					123.6

(3) Concreting Work

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Total SWL dB(A)
Mobile Crane	CNP 048	1	112	100.0%	112.0
Concrete Lorry Mixer	CNP 044	1	109	100.0%	109.0
Bar Bender and cutter	CNP 021	1	90	100.0%	90.0
Concrete pump	CNP 047	1	109	100.0%	109.0
Poker (Power Rating limited to 2kW)	CNP 170	3	113	100.0%	117.8
Chipper, hand held	CNP 043	1	112	100.0%	112.0
Saw, circular, wood	CNP 201	1	108	100.0%	108.0
Generator	CNP 102	1	100	100.0%	100.0
Air Compressor	CNP 003	1	104	100.0%	104.0
Total					120.7

(4) Miscellaneous Work

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Total SWL dB(A)
Excavator	CNP 081	1	112	100.0%	112.0
Mobile Crane	CNP 048	1	112	100.0%	112.0
Lorry	CNP 141	1	112	100.0%	112.0
Compactor	CNP 050	1	105	100.0%	105.0
Generator	CNP 102	1	100	100.0%	100.0
Air Compressor	CNP 003	1	104	100.0%	104.0
Roller	CNP 186	1	108	100.0%	108.0
Total					117.8

Western Interceptor Sewer Sewage Pumping Station

NSR	Description	Type of Use	Distances between NSR and the notional noise source (m)
WYH	ICAC Training Camp	Residential	89
JCC	Ju Ching Chu Secondary School	School	93

(1) Site Clearance and Set Up Site Office

Assessment Points	SWL, dB(A)	Distance, m	SPL, dB(A)
WYH	124	89	80.2
JCC		93	79.8

(2) Excavation Work

Assessment Points	SWL, dB(A)	Distance, m	SPL, dB(A)
WYH	124	89	79.6
JCC		93	79.2

(3) Concreting Work

Assessment Points	SWL, dB(A)	Distance, m	SPL, dB(A)
WYH	121	89	76.7
JCC		93	76.3

(4) Miscellaneous Work

Assessment Points	SWL, dB(A)	Distance, m	SPL, dB(A)
WYH	118	89	73.8
JCC		93	73.5

**Powered Mechanical Equipment (PME) for the Different
Construction Tasks during Normal Daytime Working Hours
(Mitigated Scenario for Western Interceptor Sewer Sewage Pumping
Station - Adoption of Quiet PMEs)**

(1) Site Clearance and Set Up Site Office

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Total SWL dB(A)
Breaker	C2/10#	1	110	100.0%	110
Excavator	C3/97#	1	105	100.0%	105
Dump Truck	C9/27#	1	105	100.0%	105
Air Compressor	CNP 002	1	102	100.0%	102
Bulldozer	C9/2 #	1	104	100.0%	104
Generator	CNP 102	1	100	100.0%	100
Total					113.3

(2) Excavation Work

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Total SWL dB(A)
Dump Truck	C9/27#	1	105	100.0%	105
Excavator	C3/97#	1	105	100.0%	105
Generator	CNP 102	1	100	100.0%	100
Air Compressor	CNP 002	1	102	100.0%	102
Breaker	C2/10 #	1	110	100.0%	110
Total					112.8

(3) Concreting Work

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Total SWL dB(A)
Mobile Crane	C7/114 #	1	101	100.0%	101
Concrete Lorry Mixer	C6/23#	1	100	100.0%	100
Bar Bender and cutter	CNP 021	1	90	100.0%	90
Concrete pump	C6/36#	1	106	100.0%	106
Poker (Power Rating limited to 2kW)	C6/32#	3	100	100.0%	105
Chipper, hand held	C6/45#	1	111	100.0%	111
Saw, circular, wood	C7/78#	1	106	100.0%	106
Generator	CNP 102	1	100	100.0%	100
Air Compressor	CNP 002	1	102	100.0%	102
Total					114.5

(4) Miscellaneous Work

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Total SWL dB(A)
Excavator	C3/97#	1	105	100.0%	105
Mobile Crane	C7/114#	1	101	100.0%	101
Lorry	C9/27#	1	105	100.0%	105
Compactor	CNP 050	1	105	100.0%	105
Generator	CNP 102	1	100	100.0%	100
Air Compressor	CNP 002	1	102	100.0%	102
Roller	CNP 186	1	108	100.0%	108
Total					112.9

**Calculation of Construction Noise Levels (Mitigated Scenario)
(Mitigated Scenario for Western Interceptor Sewer Sewage Pumping
Station - Adoption of Quiet PMEs)**

Western Interceptor Sewer Pumping Station

NSR	Description	Type of Use	Distances between NSR and the notional noise source (m)
WYH	ICAC Training Camp	Residential	89
JCC	Ju Ching Chu Secondary School	School	93

(1) Site Clearance and Set Up Site Office

Assessment Points	SWL, dB(A)	Distance, m	SPL, dB(A)
WYH	113	89	69.3
JCC		93	68.9

(2) Excavation Work

Assessment Points	SWL, dB(A)	Distance, m	SPL, dB(A)
WYH	113	89	68.8
JCC		93	68.4

(3) Concreting Work

Assessment Points	SWL, dB(A)	Distance, m	SPL, dB(A)
WYH	115	89	70.6
JCC		93	70.2

(4) Miscellaneous Work

Assessment Points	SWL, dB(A)	Distance, m	SPL, dB(A)
WYH	113	89	68.9
JCC		93	68.6

**Powered Mechanical Equipment (PME) for the Different
Construction Tasks during Normal Daytime Working Hours
(Mitigated Scenario for Western Interceptor Sewer Sewage Pumping
Station) (Adoption of Quiet PMEs + Reducing no. of operated PMEs)**

(1) Site Clearance and Set Up Site Office

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Total SWL dB(A)
Breaker	C2/10#	0	110	100.0%	0
Excavator	C3/97#	1	105	100.0%	105
Dump Truck	C9/27#	0	105	100.0%	0
Air Compressor	CNP 002	1	102	100.0%	102
Bulldozer	C9/2 #	1	104	100.0%	104
Generator	CNP 102	1	100	100.0%	100
Total					109.2

(2) Excavation Work

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Total SWL dB(A)
Dump Truck	C9/27#	1	105	100.0%	105
Excavator	C3/97#	1	105	100.0%	105
Generator	CNP 102	1	100	100.0%	100
Air Compressor	CNP 002	1	102	100.0%	102
Breaker	C2/10 #	0	110	100.0%	0
Total					109.5

(3) Concreting Work

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Total SWL dB(A)
Mobile Crane	C7/114 #	0	101	100.0%	0
Concrete Lorry Mixer	C6/23#	1	100	100.0%	100
Bar Bender and cutter	CNP 021	1	90	100.0%	90
Concrete pump	C6/36#	1	106	100.0%	106
Poker (Power Rating limited to 2kW)	C6/32#	1	100	100.0%	100
Chipper, hand held	C6/45#	0	111	100.0%	0
Saw, circular, wood	C7/78#	0	106	100.0%	0
Generator	CNP 102	1	100	100.0%	100
Air Compressor	CNP 002	1	102	100.0%	102
Total					109.4

(4) Miscellaneous Work

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Total SWL dB(A)
Excavator	C3/97#	1	105	100.0%	105
Mobile Crane	C7/114#	0	101	100.0%	0
Lorry	C9/27#	0	105	100.0%	0
Compactor	CNP 050	1	105	100.0%	105
Generator	CNP 102	1	100	100.0%	100
Air Compressor	CNP 002	1	102	100.0%	102
Roller	CNP 186	0	108	100.0%	0
Total					109.5

**Calculation of Construction Noise Levels (Mitigated Scenario)
(Mitigated Scenario for Western Interceptor Sewer Sewage Pumping
Station) (Adoption of Quiet PME's + Reducing no. of operated PME's)**

Western Interceptor Sewer Pumping Station

NSR	Description	Type of Use	Distances between NSR and the notional noise source (m)
JCC	Ju Ching Chu Secondary School	School	93

(1) Site Clearance and Set Up Site Office

Assessment Points	SWL, dB(A)	Distance, m	SPL, dB(A)
JCC	109	93	64.8

(2) Excavation Work

Assessment Points	SWL, dB(A)	Distance, m	SPL, dB(A)
JCC	109	93	65.1

(3) Concreting Work

Assessment Points	SWL, dB(A)	Distance, m	SPL, dB(A)
JCC	109	93	65.0

(4) Miscellaneous Work

Assessment Points	SWL, dB(A)	Distance, m	SPL, dB(A)
JCC	109	93	65.1

Annex 2 - Operational Noise Impact Assessment

Western Interceptor Sewer Pumping Station

WYH

Potential Noise Sources	Sound Power Level for Each Equipment	No.	Total Sound Power Level dB(A)	Distance to Sources (m)	Distance Corrections	Façade Effect	Screening Effect	Correction from Silencer	Tonality Effect	Predicted Noise Level	SPL dB(A)
1 Submersible Pump	88	2	91.0	93	-47.4	3	-20		6	32.6	
2 Exhaust Fan	79	4	85.0	81	-46.2	3		-10	6	37.9	
3 Transformer	85	1	85.0	89	-47.0	3	-20		6	27.0	
4 Mechanically raked fine screen	89	2	92.0	93	-47.4	3	-20			27.6	
Total SPL =											39.6

JCC

Potential Noise Sources	Sound Power Level for Each Equipment	No.	Total Sound Power Level dB(A)	Distance to Sources (m)	Distance Corrections	Façade Effect	Screening Effect	Correction from Silencer	Tonality Effect	Predicted Noise Level	SPL dB(A)
1 Submersible Pump	88	2	91.0	99	-47.9	3	-20		6	32.1	
2 Exhaust Fan	79	4	85.0	83	-46.4	3		-10	6	37.6	
3 Transformer	85	1	85.0	104	-48.3	3	-20		6	25.7	
4 Mechanically raked fine screen	89	2	92.0	99	-47.9	3	-20			27.1	
Total SPL =											39.2

PRD

Potential Noise Sources	Sound Power Level for Each Equipment	No.	Total Sound Power Level dB(A)	Distance to Sources (m)	Distance Corrections	Façade Effect	Screening Effect	Correction from Silencer	Tonality Effect	Predicted Noise Level	SPL dB(A)
1 Submersible Pump	88	2	91.0	78	-45.8	3	-20		6	34.2	
2 Exhaust Fan	79	4	85.0	64	-44.1	3		-10	6	39.9	
3 Transformer	85	1	85.0	68	-44.7	3	-20		6	29.3	
4 Mechanically raked fine screen	89	2	92.0	78	-45.8	3	-20			29.2	
Total SPL =											41.5

Remark:

- (i) SWL for Pump makes reference to "Tuen Mun Sewerage - Eastern Coastal Sewerage Extension Final EIA Report (2000)"
- (ii) SWL for Exhaust Fan makes reference to EPD "Good Practices on Ventilation System Noise Control"
- (iii) SWL for transformer make reference to "Upgrading and expansion of San Wai Sewage Treatment Works and expansion of Ha Tsuen Pumping Station -EIA (2003)".
- (iv) Overall noise reduction of 20 dB(A) is assumed for the pumps which will be located underground and would be housed in a 200mm thick reinforced concrete structure with acoustic louvers. Overall noise reduction of 20 dB(A) is assumed for the transformer and mechanically raked screens which will be housed in an enclosed 200mm thick reinforced concrete structure with acoustic louvers. Silencers will be provided for the exhaust fans with noise attenuation of 10 dB(A).
- (v) In accordance with NCO, 6 dB(A) for tonality correction was applied to exhaust fan of the deodorization unit, pump and transformer as a conservative approach.

**APPENDIX C
TREE SURVEY RESULTS**

TREE NO.	BOTANICAL NAME	CHINESE NAME	JURISDICTION (AFCD/LCSD/HyD/ASD)	SIZE (M)			FORM (Good/Fair/Poor)	HEALTH (Good/Fair/Poor)	AMENITY VALUE (High/Medium/Low)	SURVIVAL RATE AFTER TRANSPLANTING (High/Medium/Low)	RECOMMENDATION	JUSTIFICATION	REMARKS
				Height	Trunk Diameter (mm)	Spread							
S5-T183	<i>Cassia siamea</i>	鐵刀木	LCSD	6	200	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	
S5-T184	<i>Cassia siamea</i>	鐵刀木	LCSD	6	200	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	
S5-T185	<i>Cassia siamea</i>	鐵刀木	LCSD	6	200	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	
S5-T186	<i>Cassia siamea</i>	鐵刀木	LCSD	6	200	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	
S5-T187	<i>Cassia siamea</i>	鐵刀木	LCSD	6	200	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T188	<i>Cassia siamea</i>	鐵刀木	LCSD	6	100	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T189	<i>Cassia siamea</i>	鐵刀木	LCSD	6	100	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T190	<i>Cassia siamea</i>	鐵刀木	LCSD	6	100	3	Fair	Fair	Medium	Medium	Transplant	Affected by sewerage works	
S5-T191	<i>Cassia siamea</i>	鐵刀木	LCSD	6	200	3	Fair	Fair	Medium	Medium	Transplant	Affected by sewerage works	
S5-T192	<i>Cassia siamea</i>	鐵刀木	LCSD	6	200	3	Fair	Fair	Medium	Medium	Transplant	Affected by sewerage works	
S5-T193	<i>Cassia siamea</i>	鐵刀木	LCSD	6	100	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	
S5-T194	<i>Acacia mangium</i>	馬占相思	LCSD	6	100	3	Fair	Fair	Medium	Low	Transplant	Affected by sewerage works	
S5-T195	<i>Eucalyptus tereticornis</i>	細葉桉	LCSD	6	100	3	Fair	Fair	Medium	Low	Transplant	Affected by sewerage works	
S5-T196	<i>Acacia auriculiformis</i>	大葉相思	LCSD	6	100	3	Fair	Fair	Medium	Low	Transplant	Affected by sewerage works	
S5-T197	<i>Acacia auriculiformis</i>	大葉相思	LCSD	6	100	3	Fair	Fair	Medium	Low	Transplant	Affected by sewerage works	
S5-T198	<i>Eucalyptus tereticornis</i>	細葉桉	LCSD	6	100	3	Fair	Fair	Medium	Low	Transplant	Affected by sewerage works	
S5-T199	<i>Acacia auriculiformis</i>	大葉相思	LCSD	6	100	3	Fair	Fair	Medium	Low	Transplant	Affected by sewerage works	
S5-T200	<i>Acacia auriculiformis</i>	大葉相思	LCSD	6	140	3	Fair	Fair	Medium	Low	Transplant	Affected by sewerage works	
S5-T201	<i>Eucalyptus tereticornis</i>	細葉桉	LCSD	6	140	3	Fair	Fair	Medium	Low	Transplant	Affected by sewerage works	
S5-T202	<i>Eucalyptus tereticornis</i>	細葉桉	LCSD	6	100	3	Fair	Fair	Medium	Low	Transplant	Affected by sewerage works	
S5-T203	<i>Cassia siamea</i>	鐵刀木	LCSD	6	140	3	Fair	Fair	Medium	Medium	Transplant	Affected by sewerage works	
S5-T204	<i>Eucalyptus tereticornis</i>	細葉桉	LCSD	6	100	3	Fair	Fair	Medium	Low	Transplant	Affected by sewerage works	
S5-T205	<i>Hibiscus tiliaceus</i>	黃槿	LCSD	6	400	3	Poor	Poor	Low	Low	Transplant	Affected by sewerage works	multi-trunk
S5-T206	<i>Hibiscus tiliaceus</i>	黃槿	LCSD	6	200	3	Poor	Poor	Low	Low	Transplant	Affected by sewerage works	multi-trunk
S5-T207	<i>Acacia confusa</i>	台灣相思	LCSD	8	300	3	Poor	Poor	Low	Low	Transplant	Affected by sewerage works	leaning trunk
S5-T208	<i>Albizia lebbek</i>	大葉合歡	LCSD	5	200	2	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T209	<i>Albizia lebbek</i>	大葉合歡	LCSD	7	300	4	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T210	<i>Ficus microcarpa</i>	細葉榕	LCSD	7	300	4	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	twisted branches
S5-T211	<i>Hibiscus tiliaceus</i>	黃槿	LCSD	5	200	2	Poor	Poor	Low	Low	Transplant	Affected by sewerage works	leaning trunk
S5-T212	<i>Leucaena leucoccephala</i>	銀合歡	LCSD	7	300	3	Poor	Poor	Low	Low	Remove	Affected by sewerage works	leaning trunk
S5-T213	<i>Cassia siamea</i>	鐵刀木	LCSD	8	100	4	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T214	<i>Cassia siamea</i>	鐵刀木	LCSD	8	100	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T215	<i>Cassia siamea</i>	鐵刀木	LCSD	8	200	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T216	<i>Cassia siamea</i>	鐵刀木	LCSD	8	200	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T217	<i>Cassia siamea</i>	鐵刀木	LCSD	8	200	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	
S5-T218	<i>Cassia siamea</i>	鐵刀木	LCSD	8	100	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T219	<i>Cassia siamea</i>	鐵刀木	LCSD	8	200	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T220	<i>Cassia siamea</i>	鐵刀木	LCSD	8	100	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T221	<i>Cassia siamea</i>	鐵刀木	LCSD	8	200	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T222	<i>Cassia siamea</i>	鐵刀木	LCSD	8	200	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	
S5-T223	<i>Cassia siamea</i>	鐵刀木	LCSD	8	140	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	
S5-T236	<i>Cassia siamea</i>	鐵刀木	LCSD	8	140	3	Fair	Fair	Medium	Medium	Transplant	Affected by sewerage works	
S5-T237	<i>Cassia siamea</i>	鐵刀木	LCSD	8	100	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T238	<i>Cassia siamea</i>	鐵刀木	LCSD	8	100	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T239	<i>Cassia siamea</i>	鐵刀木	LCSD	8	100	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T240	<i>Cassia siamea</i>	鐵刀木	LCSD	8	100	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T241	<i>Cassia siamea</i>	鐵刀木	LCSD	8	140	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T242	<i>Cassia siamea</i>	鐵刀木	LCSD	8	100	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T243	<i>Cassia siamea</i>	鐵刀木	LCSD	8	100	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T244	<i>Cassia siamea</i>	鐵刀木	LCSD	8	100	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T245	<i>Cassia siamea</i>	鐵刀木	LCSD	8	100	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T246	<i>Cassia siamea</i>	鐵刀木	LCSD	8	100	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T247	<i>Cassia siamea</i>	鐵刀木	LCSD	8	100	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T248	<i>Cassia siamea</i>	鐵刀木	LCSD	8	100	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T249	<i>Cassia siamea</i>	鐵刀木	LCSD	8	140	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T250	<i>Cassia siamea</i>	鐵刀木	LCSD	8	100	3	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T251	<i>Acacia mangium</i>	馬占相思	LCSD	8	100	3	Poor	Poor	Low	Low	Transplant	Affected by sewerage works	dual trunk
S5-T252	<i>Cassia siamea</i>	鐵刀木	LCSD	5	100	2	Poor	Poor	Low	Medium	Transplant	Affected by sewerage works	leaning trunk
S5-T260	<i>Eucalyptus tereticornis</i>	細葉桉	LCSD	8	100	3	Poor	Poor	Low	Low	Transplant	Affected by sewerage works	
S5-T261	<i>Eucalyptus tereticornis</i>	細葉桉	LCSD	8	100	3	Poor	Poor	Low	Low	Transplant	Affected by sewerage works	leaning trunk
S5-T262	<i>Eucalyptus tereticornis</i>	細葉桉	LCSD	8	100	3	Poor	Poor	Low	Low	Transplant	Affected by sewerage works	leaning trunk
S5-T263	<i>Acacia mangium</i>	馬占相思	LCSD	8	100	3	Fair	Fair	Medium	Low	Transplant	Affected by sewerage works	
S5-T264	<i>Acacia mangium</i>	馬占相思	LCSD	8	100	3	Fair	Fair	Medium	Low	Transplant	Affected by sewerage works	
S5-T265	<i>Eucalyptus tereticornis</i>	細葉桉	LCSD	8	100	3	Fair	Fair	Medium	Low	Transplant	Affected by sewerage works	multi-trunk

**APPENDIX D
EXISTING AND EXPECTED VIEW
CONDITIONS OF THE PROJECT SITE**

APPENDIX D EXISTING AND EXPECTED VIEW CONDITIONS OF THE PROJECT SITE



Photo No. 1 – Existing View Condition of the Site for the Proposed Western Interceptor Sewer Sewage Pumping Station

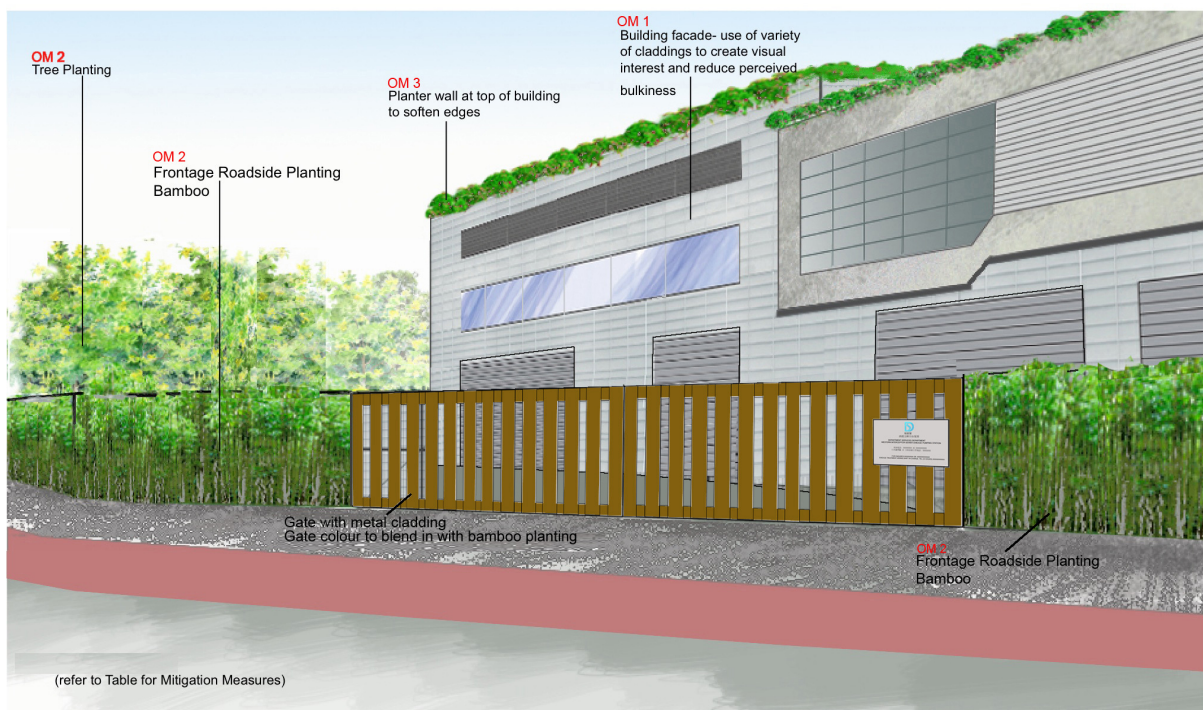


Photo No. 2 – Expected View Condition of the Project Site (Proposed Western Interceptor Sewer Sewage Pumping Station)

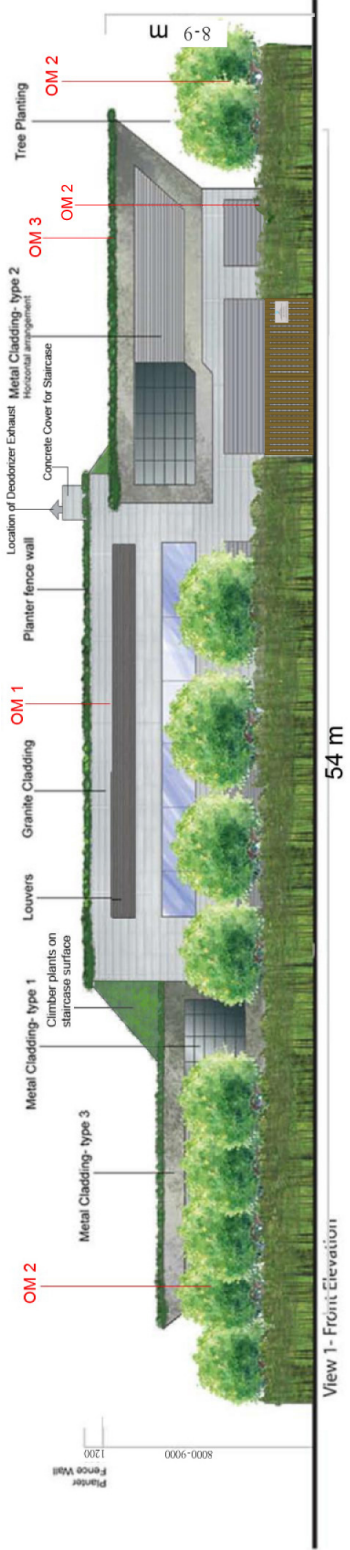
Mitigation Measures Table

Construction Phase	
CM1	Site hoarding to compatible with the surrounding environment
CM2	Control of night time lighting
CM3	Site supervision to minimize disturbance to pedestrian and cyclists during construction phase.
Operation Phase	
OM1	Aesthetic design of WISSPS structure such as use of materials, architectural form and colour
OM2	Screen planting to mitigate landscape and visual impact
OM3	Provision of greenery- green roof and wall planter
OM4	Reinstatement of excavated area

**APPENDIX E
LANDSCAPE PLAN FOR WESTERN
INTERCEPTOR SEWER SEWAGE PUMPING
STATION**

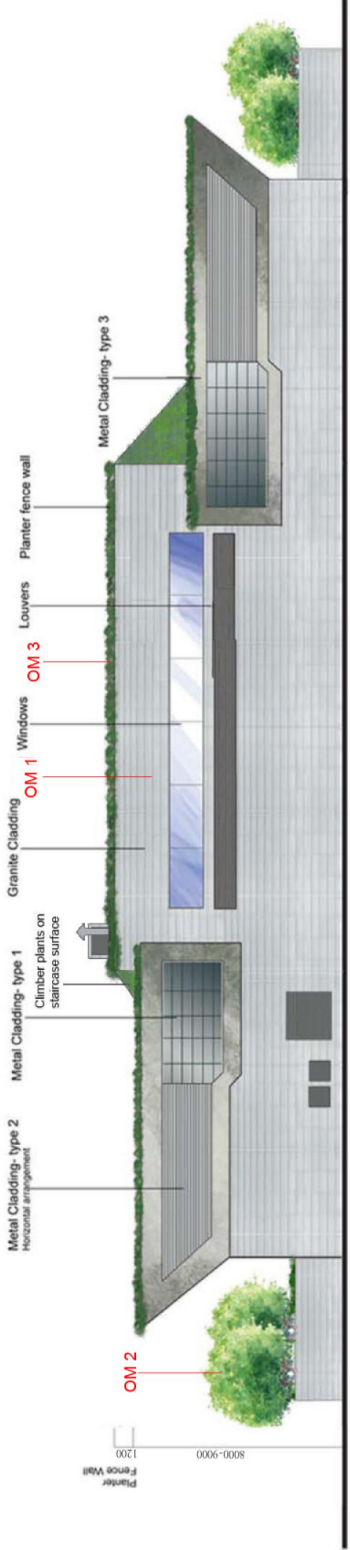
Appendix E - Landscape Plan for Western Interceptor Sewer Sewage Pumping





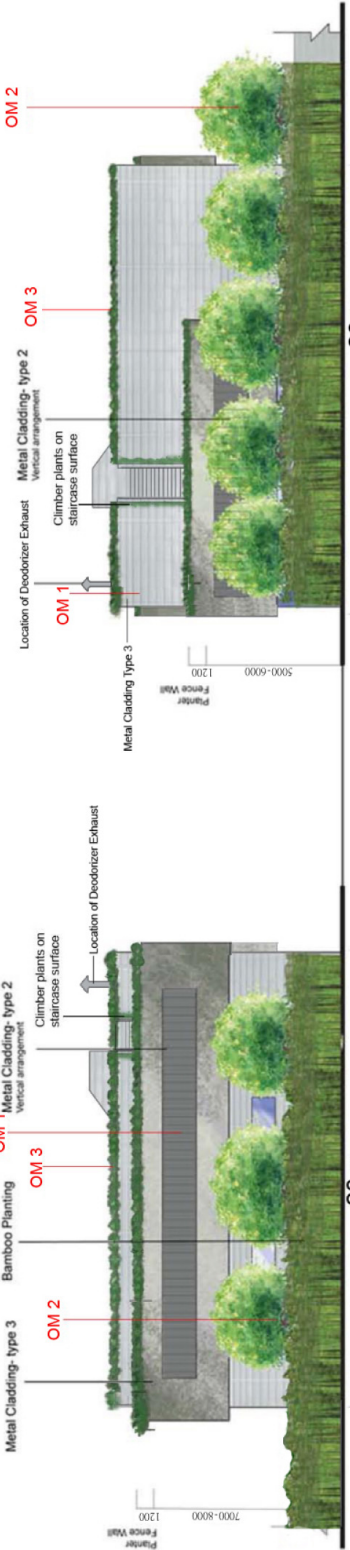
View 1- Front Elevation

54 m



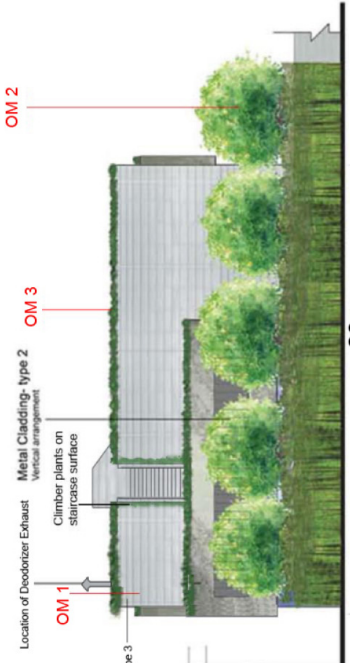
View 2- Back Elevation

48.50



View 3- North Elevation

20 m



View 4- South Elevation

20 m

(Sectional view)

(refer to Table for Mitigation Measures)

Mitigation Measures Table

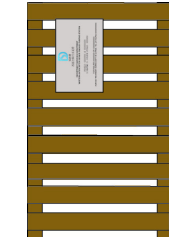
Construction Phase	
CM1	Site hoarding to compatible with the surrounding environment
CM2	Control of night time lighting
CM3	Site supervision to minimize disturbance to pedestrian and cyclists during construction phase.
Operation Phase	
OM1	Aesthetic design of WISSPS structure such as use of materials, architectural form and colour
OM2	Screen planting to mitigate landscape and visual impact
OM3	Provision of greenery- green roof and wall planter
OM4	Reinstatement of excavated area

**APPENDIX F
MATERIALS AND PLANTINGS SCHEDULE**

Appendix F - Materials and Plantings Schedule



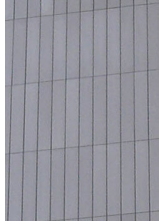
Granite Cladding for fence wall and building facade
Bluish- Grey



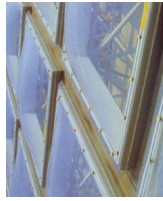
Entrance Gate
Colour to blend in with bamboo planting



Metal Cladding Type 2
For building facade
Vertical and Horizontal
Arrangement
Alucobond 5000® Silver
Metallic



Metal Cladding Type 1
For building facade
Alucobond® 603 Grey
Blue Metallic



Tinted Light Blue
Polycarbonate Sky
Window



Glass Facade/
Windows



Concrete Paving Block for EVA
Light Grey
Bonding Herringbone 90



Cassia surattensis 黃槐



Rhododendron
pulchrum 紫杜鵑



Bougainvillea
spectabilis 毛寶巾



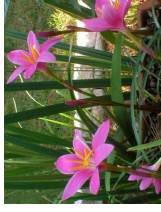
Ficus pumila 薛荔



Bambusa vulgaris cv
Wamin 大佛士竹



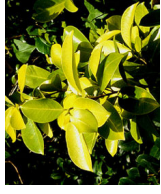
Catharanthus roseus
长春花



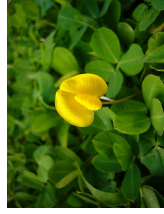
Zephyranthes
grandiflora 风雨花



Parthenocissus
himalayana 爬藤虎



Ficus microcarpa
'Golden Leaf' 黄榕



Arachis pintoi
'golden glory' 花生藤



Zoysia japonica 朝鮮草



Bauhinia corymbosa
首冠藤



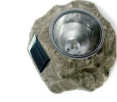
Solar Power Street
Lighting



Solar Power
CCTV



Solar Power Security
Lighting



Solar Landscape
Lighting

**APPENDIX G
STUDY RESULTS OF THE SURROUNDING
COMMUNITIES OF LVIA STUDY AREA**

Appendix G – Study Results of the Surrounding Communities of the LVIA Study Area

Construction Phase

Group 1 - Community Institutions

This group refers to users of the community institution on the west of the WISSPS. Community institutions in this group include Yan Chai Hospital No 2 Secondary School, Ju Ching Chu Secondary School, ICAC Training Camp and Hon Chi Morning Hill School. Approximate distance between the group and the source is 80-200m. This group has partial visibility to the proposed WISSPS as the view is blocked by existing trees. No significant impact of visual impact is anticipated.

Group 2- NAM Fung Industrial City

This group refers to the users of Nam Fung Industrial City on the north-eastern side of the proposed WISSPS. Visibility to proposed WISSPS depends on the viewing level. Approximate distance between the group and source is 95m. This group has full visibility to the proposed WISSPS. Since limited outdoor human activity is anticipated in this area, no significant impact of visual impact is foreseen..

Group 3- Hoh Fuk Tong Primary School

This group refers to the users of Hoh Fuk Tong Primary School on the south side of the proposed WISSPS. Approximate distance between the group and source is 120m. This group has partial visibility to the proposed WISSPS as the view is blocked by existing trees. No significant impact of visual impact is anticipated.

Group 4- Lung Mun Oasis

This group refers to residents of the Lung Mun Oasis. The residents have partial to full visibility to the proposed WISSPS, depending on height and orientation of viewers. Approximate distance between the group and the source is 170m. No significant impact of visual impact is anticipated.

Group 5- Road Travelers along Lung Fu Road (Elevated Highway)

This group refers to road users along Lung Fu Road. The road is elevated and users have glimpse visibility from above when traveling along the road. Approximate distance between the group and the source is 30m. No significant impact of visual impact is anticipated.

Group 6- Road Travelers along Wong Chu Road

This group refers to road users along Wong Chu Road. This one way traffic road connects with Tsing Wun Road and users have glimpse visibility from ground level to the proposed WISSPS. Approximate distance between the group and the source is 10m. No significant impact of visual impact is anticipated.