

**Tseung Kwan O – Lam Tin Tunnel
and Associated Works**

Project Profile

Civil Engineering and Development Department

July 2008

Tseung Kwan O – Lam Tin Tunnel and Associated Works**Project Profile****Table of Contents**

| | Page |
|---|-------------|
| 1. BASIC INFORMATION | 1 |
| 2. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME | 4 |
| 3. POSSIBLE IMPACT ON THE ENVIRONMENT | 5 |
| 4. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT | 9 |
| 5. ENVIRONMENTAL PROTECTION MEASURES AND ANY FURTHER ENVIRONMENTAL IMPLICATIONS | 12 |
| 6. USE OF PREVIOUSLY APPROVED EIA REPORT | 16 |

DRAWINGS

| | |
|---------|---|
| TKZ0567 | - TSEUNG KWAN O – LAM TIN TUNNEL AND ASSOCIATED WORKS – LAYOUT PLAN |
| TKZ0568 | - MAJOR EXISTING AND PLANNED SENSITIVE RECEIVERS – LOCATION PLAN |

1. BASIC INFORMATION

1.1 Project Title

1.1.1 Tseung Kwan O – Lam Tin Tunnel and Associated Works

1.2 Purpose and Nature of Project

1.2.1 This project profile covers two Designated Projects (DPs), namely, Tseung Kwan O – Lam Tin Tunnel (TKO-LT Tunnel) and Lei Yue Mun Road Underpass (LYMR Underpass).

1.2.2 The proposed TKO-LT Tunnel is a dual two-lane highway of approximately 4.8 km long connecting Tseung Kwan O (TKO) at Po Yap Road in the east with Trunk Road T2 in Kai Tak Development in the west. About 3km of the highway is in the form of tunnel. TKO-LT Tunnel will meet the TKO external traffic demand as a result of continual development of TKO. TKO-LT Tunnel, together with Trunk Road T2 and Central Kowloon Route, will form Trunk Road Route 6 which will provide an east-west express link between Kowloon and TKO areas.

1.2.3 The proposed LYMR Underpass is a single lane underpass along LYMR across its junctions with Kai Tin Road and Yau Tong Road. It aims to improve the traffic condition of Lei Yue Mun Road/Kai Tin Road junction.

1.3 Name of Project Proponent

1.3.1 New Territories East Development Office, Civil Engineering and Development Department, HKSAR Government.

1.4 Background, Location and Scale of Project

1.4.1 In July 2002, the Civil Engineering and Development Department (CEDD) commissioned the Feasibility Study for Further Development of Tseung Kwan O (the TKO Study) to formulate a comprehensive plan for further development of TKO and improvement of its overall design with a view to building TKO into a new town that can boast of its convenience, vibrancy, distinctive urban design and quality living environment. As an integral part of the TKO Study, the long-term transport need of TKO had been examined.

1.4.2 The TKO Study was substantially completed in 2005. The TKO Study identified that the TKO Tunnel (the existing main connection between TKO and other areas in the territory) would have insufficient capacity to cater for the projected traffic flow as a result of further population intake and development. It recommended that a new external road network comprising the CBL and TKO-LT Tunnel should be provided around 2016 to meet the anticipated traffic flow.

1.4.3 The original alignment scheme of the TKO-LT Tunnel was endorsed under the TKO Study. In the endorsed road scheme, the Kowloon Section of TKO-LT Tunnel would pass through a planned housing development at the Kaolin Mine Site, with the road formation for the Kowloon Section and local road connections

completed as part of the housing development. After passing through Kaolin Mine Site, the Kowloon Section would connect to the Trunk Road T2 in Kai Tak Development which was originally planned to be on viaduct.

- 1.4.4 Subsequently under the Kai Tak Planning Review, T2 was replanned as a submerged tunnel. To match this change in planning of T2, it is necessary to update the scheme of the TKO-LT Tunnel. Preliminary assessments have indicated that the main tunnel of TKO-LT Tunnel may be connected to T2 by viaduct or by tunnel. The final scheme has to be determined by further studies.
- 1.4.5 The LYMR Underpass was proposed in 1996 after a transport study by Transport Department indicated that the local road network would be saturated due to the future population intake in Lei Yue Mun and Yau Tong areas. As such, the LYMR Underpass was planned with the Environmental Impact Assessment (EIA) Report approved in February 2002. As the road configurations for the area will be affected by the TKO-LT Tunnel, an updating of the road scheme and EIA for LYMR Underpass is required.
- 1.4.6 The schematic layout of LYMR Underpass and TKO-LT Tunnel is shown on the attached Drawing No. TKZ0567.
- 1.4.7 The scope of the TKO-LT Tunnel project is to provide a highway and the associated interchange connecting TKO at Po Yap Road in the east and Trunk Road T2 in Kai Tak Development in the west. It comprises the following:
- (a) a dual two-lane highway approximately 4.8 km long. About 3km of the highway is in the form of tunnel;
 - (b) slip roads, depressed roads, viaducts, toll plaza, ventilation, administration buildings, tunnel portal facilities and reclamation on TKO side;
 - (c) slip roads, branch tunnels, viaducts, depressed roads, tunnel portal facilities, ventilation, and administration buildings on Kowloon side; and
 - (d) the associated building, civil, structural, marine, electrical and mechanical, landscape, and environmental protection and mitigation works.
- 1.4.8 The scope of the LYMR Underpass project is to provide a single lane eastbound underpass along LYMR. It comprises the following:
- (a) construction of about 270m of underpass along LYMR across its junctions with Kai Tin Road, slip road to Eastern Harbour Crossing (EHC) and Yau Tong Road;
 - (b) modification of the LYMR/Kai Tin Road roundabout and the junctions of LYMR with Yau Tong Road and slip road to EHC; and
 - (c) the associated civil, structural, landscape and noise mitigation works.

1.4.9 As pointed out in paragraphs 1.4.4 and 1.4.5 above, the schemes for TKO-LT Tunnel and LYMR Underpass will need to be updated. The layout shown on Drawing No. TKZ0567 and the scope described in paragraphs 1.4.7 and 1.4.8 above may be changed as a result of updating by further studies.

1.5 Number and Types of Designated Project to be Covered by the Project Profile

1.5.1 This project profile covers the following DPs under Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO):

- (a) TKO-LT Tunnel, being a trunk road, is considered as a DP under Schedule 2, Part I, A.1, A.7, A.8, A.9, C.1, C.2(c) and C.12 of the EIAO; and
- (b) LYMR Underpass, being a primary distributor, is considered as a DP under Schedule 2, Part I, A.1 of the EIAO

1.6 Name and Telephone Number of Contact Persons

1.6.1 All enquiries regarding the project can be addressed to:

| | |
|---------------|--|
| Mr HO Lap Yan | Senior Engineer/H(2) New Territories East Development Office Civil Engineering and Development Department Tel. No.: 2301 1395 Fax No.: 2721 8630 |
|---------------|--|

2. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

2.1 Project Planning and Implementation

2.1.1 The Project Proponent will engage consultants to undertake environmental impact assessment (EIA) study, investigation, design and supervision of construction of the project.

2.2 Project Timetable

2.2.1 The tentative implementation programme is as follows:

| | | | |
|--------------------------------------|------------|---|-----------|
| Investigation and Preliminary Design | Early 2009 | - | Late 2011 |
| Detailed Design and Tendering | Late 2011 | - | Late 2013 |
| Construction | Late 2012 | - | End 2016 |

2.3 Interaction with Other Projects

2.3.1 The project may have interaction with the other projects including, but not limited to the following:

- (a) Cross Bay Link; and
- (b) Trunk Road T2.

3. POSSIBLE IMPACT ON THE ENVIRONMENT

The potential environmental impacts of the proposed works that may arise during both construction and operational phases are described below:

3.1 Air Quality

Construction Phase

3.1.1 Possible air quality impacts during construction phase include:

- fugitive dust arising from reclamation, demolition and construction of structures, movement of construction traffic over the site area, and wind erosion of open sites and stockpiling areas
- cumulative impact of fugitive dust resulting from any adjacent construction works

3.1.2 Air sensitive receivers (ASRs) such as residential premises, offices, shopping centers, and active open spaces in the vicinity of the work sites may be impacted.

Operation Phase

3.1.3 Operation phase air quality impact arising would be vehicle emissions of nitrogen dioxide and respirable suspended particulates from traffic on the proposed roads including the toll plaza area. Cumulative air quality impact from tunnel portal ventilation buildings emissions, Cross Bay Link, Trunk Road T2, the existing roads and the existing EHC could have impact on the nearby ASRs.

3.2 Noise

Construction Phase

3.2.1 During the construction phase, powered mechanical equipment which are expected to generate noise include: breakers (both portable and excavator-mounted), power units for various types of plant, including air compressors, excavators, ready mixed concrete lorries and poker vibrators, drilling machines and cranes. Moreover, major noisy activities include breaking road surface, excavation, blasting, cutting of rock slopes, piling, concreting, and road surfacing and handling of earth materials.

3.2.2 Noise sensitive receivers (NSRs) such as residential premises and schools in the vicinity of the work sites may be impacted.

Operation Phase

3.2.3 During the operational phase, traffic noise from the new road may have impact to the NSRs. Fixed plant noise such as ventilation fans from the ventilation buildings would likely be a concern.

3.3 Water Quality

Construction Phase

- 3.3.1 Dredging, disposal of dredged materials and reclamation works using methods to strengthen the sea mud, where possible, would be the main construction activities resulting in water quality impact. Possible methods to strengthen the sea mud may include deep cement mixing (DCM), sand compaction pile and stone column. DCM is a ground treatment method which involves injecting controlled volumes of cement into the sea mud. The sand compaction pile and stone column are to inject respectively sand and stone to replace the sea mud to form columns of strengthened material.
- 3.3.2 During dredging, strengthening of sea mud and other reclamation activities, there could be temporary elevation in concentrations of suspended solids and generation of sediment plumes, leakage of cement, possible release of organic and inorganic contaminants and nutrients as well as creation of potential embayment, which may affect the water quality of Junk Bay.
- 3.3.3 For the land-based construction works, site runoff would be the major source of water quality impact.

Operation Phase

- 3.3.4 While the reclamation along the north-western shoreline of Junk Bay will not cause any embayment, the influence of the change in coastline configuration on the hydrodynamic and water quality conditions of the Junk Bay will need to be assessed.

3.4 Ecological and Fisheries

Construction Phase

- 3.4.1 Dredging, disposal of dredged materials, strengthening of sea mud and reclamation activities may impact the isolated small colonies of corals located along the western and eastern coastline of Junk Bay, as identified in earlier ecological studies, and fisheries in the area.
- 3.4.2 The construction of the toll plaza of TKO-LT tunnel has the potential to affect populations of Philippine Neon Goby recorded in a stream at western coastline of Junk Bay as there would be disturbance to coastal area close to where the stream discharge into Junk Bay.

Operation Phase

- 3.4.3 During the operation phase, road surface run-off from TKO-LT Tunnel may affect local fisheries and the isolated small colonies of corals in Junk Bay. The Philippine Neon Goby population may be impacted by the reclamation works if the passage of larvae/juveniles to and from marine habitats is impeded.

3.5 Waste Management

Construction Phase

- 3.5.1 Wastes generated by the construction works may include excavated spoil and sediment, surplus construction materials, used products and municipal type waste. The possible presence of contaminated sediments that may require dredging and disposal will need to be assessed.

Operation Phase

- 3.5.2 Wastes generated during the operation phase would be limited, comprising some domestic and commercial wastes.

3.6 Landscape and Visual

Construction Phase

- 3.6.1 Landscape and visual impacts are expected from construction works such as reclamation, road construction, construction plant, etc. The impacts would be temporary.

Operation Phase

- 3.6.2 During operational phase, there will be visual impacts arisen from the new coastline and from new development proposals, including the roads and bridges. Residual impacts would occur primarily from loss of bay waters due to reclamation.

3.7 Cultural Heritage

Built Heritage

- 3.7.1 Both construction and operation phases of the project will not affect any declared monuments and graded historic buildings. This will be reviewed in the assessment.

Terrestrial Archaeology

- 3.7.2 Both construction and operation phases of the project will not affect any sites of terrestrial archaeological interests. This will be reviewed in the assessment.

Marine Archaeology

- 3.7.3 In the EIA of the Feasibility Study for Further Development of Tseung Kwan O, four surface anomalies and two buried anomalies were identified. During construction and operation phases, impact upon areas of marine archaeological potential, if any, would be avoided as far as practicable. This would be subject to the findings of a visual diver survey which includes a series of transect dives along the western shore and circular searches on the seabed surface anomaly.

3.8 Landfill Gas and Leachate Hazards

- 3.8.1 Part of the Kowloon section of TKO-LT Tunnel falls within the Consultation Zone of Sai Tso Wan Landfill. Landfill gas and leachate hazards during construction and operation phases will need to be assessed.

4. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

4.1 The major existing and planned sensitive receivers that may be affected by the project are summarized as follows. The locations of these receivers are shown in the attached drawing no. TKZ0568.

| Ref | Sensitive Receiver | Type | Status |
|-----|---|-------------|----------|
| 1 | Laguna City | Residential | Existing |
| 2 | Existing residential development along Cha Kwo Ling | Residential | Existing |
| 3 | Yau Tong Estate | Residential | Existing |
| 4 | Yau Lai Estate | Residential | Existing |
| 5 | Hong Pak Court | Residential | Existing |
| 6 | Kwong Tin Estate | Residential | Existing |
| 7 | Ping Tin Estate | Residential | Existing |
| 8 | Sceneway Garden | Residential | Existing |
| 9 | Yau Mei Court | Residential | Existing |
| 10 | Hong Nga Court | Residential | Existing |
| 11 | Tak Tin Estate | Residential | Existing |
| 12 | Ko Cheung Court | Residential | Existing |
| 13 | Ko Yee Estate | Residential | Existing |
| 14 | Ko Chun Court | Residential | Existing |
| 15 | Hong Shui Court | Residential | Existing |
| 16 | Lei On Court | Residential | Existing |
| 17 | Ocean Shores | Residential | Existing |
| 18 | Bauhinia Garden | Residential | Existing |
| 19 | Metro Town | Residential | Existing |
| 20 | Park Central | Residential | Existing |
| 21 | Central Heights | Residential | Existing |
| 22 | Grandiose | Residential | Existing |
| 23 | Tseung Kwan O Plaza | Residential | Existing |
| 24 | Kin Ming Estate | Residential | Existing |
| 25 | Choi Ming Court | Residential | Existing |
| 26 | Tong Ming Court | Residential | Existing |
| 27 | Beverly Garden | Residential | Existing |
| 28 | Sheung Tak Estate | Residential | Existing |
| 29 | Cha Kwo Ling Village | Squatter | Existing |
| 30 | FDBWA Szeto Ho Secondary | Educational | Existing |

| | | | |
|----|--|--------------------------------|--------------------|
| | School | | |
| 31 | SKH Kei Hau Secondary School | Educational | Existing |
| 32 | Buddist Ho Nam Kam Prevocational School | Educational | Existing |
| 33 | St Antonius Girls College | Educational | Existing |
| 34 | St Antonius Primary School | Educational | Existing |
| 35 | SKH Yautong Kei Hin Primary School | Educational | Existing |
| 36 | CCC Kei Faat Primary School (Yau Tong) | Educational | Existing |
| 37 | Tseung Kwan O Catholic Primary School | Educational | Existing |
| 38 | PLK Wong Wing Shu Primary School | Educational | Existing |
| 39 | Pok Oi Hospital 80th Anniversary Tang Ying Hei College | Educational | Existing |
| 40 | Yan Chai Hospital Wong Wah San Secondary School | Educational | Existing |
| 41 | Christian & Missionary Alliance Sun Kei Secondary School | Educational | Existing |
| 42 | Yan Oi Tong Tin Ka Ping Primary School | Educational | Existing |
| 43 | Chi Lin Buddhist Primary School | Educational | Existing |
| 44 | Tseung Kwan O Methodist Primary School | Educational | Existing |
| 45 | Evangel College | Educational | Existing |
| 46 | Tseung Kwan O Area 74 | Educational | Under Construction |
| 47 | Sai Tso Wan Playground | Recreational | Existing |
| 48 | Lei Yue Mun Road Playground | Recreational | Existing |
| 49 | Junk Bay | Water Bodies | Existing |
| 50 | Eastern Harbour Crossing Housing Development | Residential | Planned |
| 51 | Yau Tong Bay Development | Comprehensive Development Area | Planned |
| 52 | Tseung Kwan O Area 68 | Residential | Planned |

Project Profile

Tseung Kwan O – Lam Tin Tunnel and Associated Works

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|----|-----------------------|--|---------|
| 53 | Tseung Kwan O Area 66 | Residential | Planned |
| 54 | Tseung Kwan O Area 65 | Residential | Planned |
| 55 | Tseung Kwan O Area 56 | Complex (Commercial, Residential, etc) | Planned |

5. ENVIRONMENTAL PROTECTION MEASURES AND ANY FURTHER ENVIRONMENTAL IMPLICATIONS

5.1 Measures to Minimize Environmental Impacts

Air Quality

5.1.1 The following dust control measures to minimize the dust nuisance during the construction phase would be considered:

- vehicle wheel and body washing facilities at site exits
- reduction of vehicular speed
- reduction of unpaved roads
- regular wetting of the site (using browsers, sprays or vapor mists) to reduce dust
- the earthmoving activities must be carefully and well planned. Such planning shall include the transportation routes as well as protective measures such as the employment of water-spraying and tarpaulin sheets to suppress the dust generated during and after excavation

5.1.2 Dust, which is predominantly associated with construction, is not expected to be an issue during the operational phase. Exhaust gaseous emission by vehicles should be considered in the air quality assessment under the EIA Study.

Noise

5.1.3 To mitigate the construction noise impacts, the following measures would be considered:

- use of silenced equipment
- use of mufflers, silencers and acoustic linings for noisy mechanical equipment
- employment of alternative concrete breaking techniques
- siting of equipment
- careful scheduling of work, especially near the educational institution where examination periods shall be taken into consideration
- use of temporary acoustic barriers
- proper maintenance of equipment
- use of construction noise specification and clauses
- adequate site supervision to ensure that every practical means is adopted to minimize the noise impacts

5.1.4 To reduce traffic noise during the operational phase, the following measures would be considered:

- low-noise road surfacing materials
- noise enclosure and/or barrier
- air-conditioning and appropriate glazed windows, if needed

Water

5.1.5 Temporary drainage systems, with interceptor manholes and appropriate sediment settlement measures, will be required to trap oil pollutants and debris initiating from within the site, and to separate pollutants prior to discharging into the drainage system. In addition, the following mitigation measures would be considered:

- sealing of sewer and drainage connections before commencement of demolition works, to prevent debris entering the public sewers/drain
- covering of stockpiles to avoid erosion and washing of solid waste into the drainage system
- installation of silt curtain during dredging or strengthening of sea mud
- control of the dredging rate to minimize the potential release of sediment during the dredging operation
- control the fine content to below 5% when backfilling using public filling material
- use of closed-grab dredger for dredging

5.1.6 During the operation phase, the following mitigation measures would be considered to reduce impact on water quality:

- provision of silt traps to reduce the concentration of silt/sediments in storm water runoff
- regular inspection and maintenance of the drainage system to ensure that pollutant removal facilities are in good working order

Ecological and Fisheries

5.1.7 The following mitigation measures would be considered to reduce the ecological and fisheries impacts:

- compensatory planting to mitigate woodland loss
- installation of silt curtain during dredging or strengthening of sea mud
- construction of seawalls with riprap facing to provide marine habitats

- erection of fencing/hoarding around works area near the stream to protect adult Philippine Neon Goby during construction, and provision of suitable passage from the stream to marine habitats during the operation phase

Waste Management

5.1.8 The following mitigation measures would be considered to reduce impacts:

- waste management in the way of avoiding, minimizing, reusing, and recycling
- removal of solid waste to a designated disposal site
- disposal of contaminated sediment to relevant designated dumping ground

Landscape and Visual

5.1.9 The following mitigation measures to minimize the landscape and visual impacts would be considered:

- compensatory planting
- aesthetic design of elevated structures, retaining walls and noise mitigation measures

Cultural Heritage

5.1.10 To minimize impacts to built heritage or sites of archaeological interests, if any, the following measures would be considered:

- preservation in whole or in part
- rescue excavation
- temporarily fenced off buffer zone
- monitoring of vibration impacts

Landfill Gas and Leachate Hazards

5.1.11 During construction phase, the precautionary measures may include but not limited to:

- special precaution regarding the possible presence of landfill gas as per the Code of Practice on Safety and Health at Work in Confined Spaces (Labour Department, Hong Kong)
- a no smoking policy
- control of welding, flame cutting or other hot works by a 'permit to work' procedure

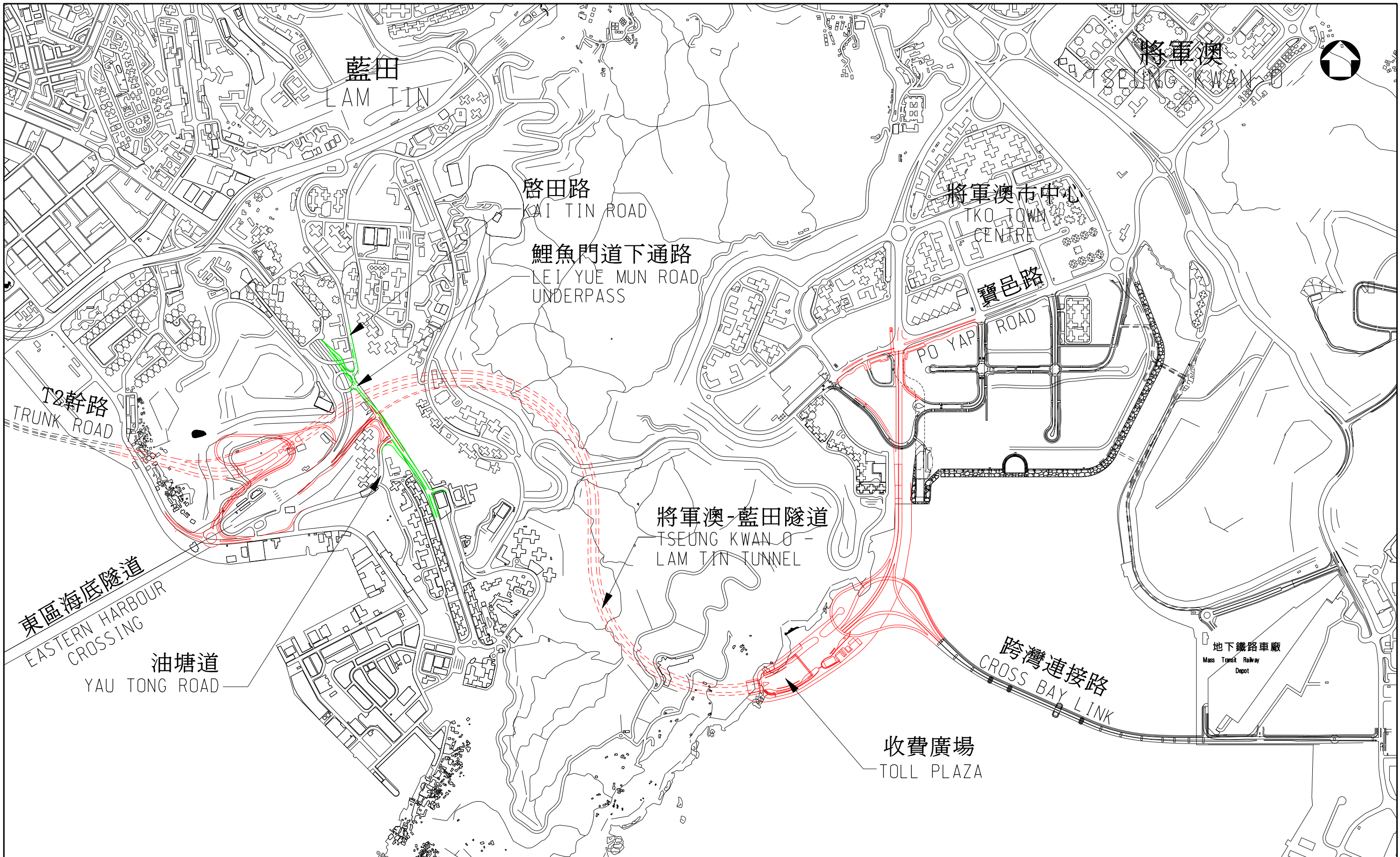
- adequate provision of fire extinguishing equipment, fire-resistant clothing and breathing apparatus sets on site
- monitoring of ground water and grouting to prevent leakage of leachate
- collection of leachate for proper treatment and disposal

5.1.12 During operation phase, the mitigation measures may include but not limited to:

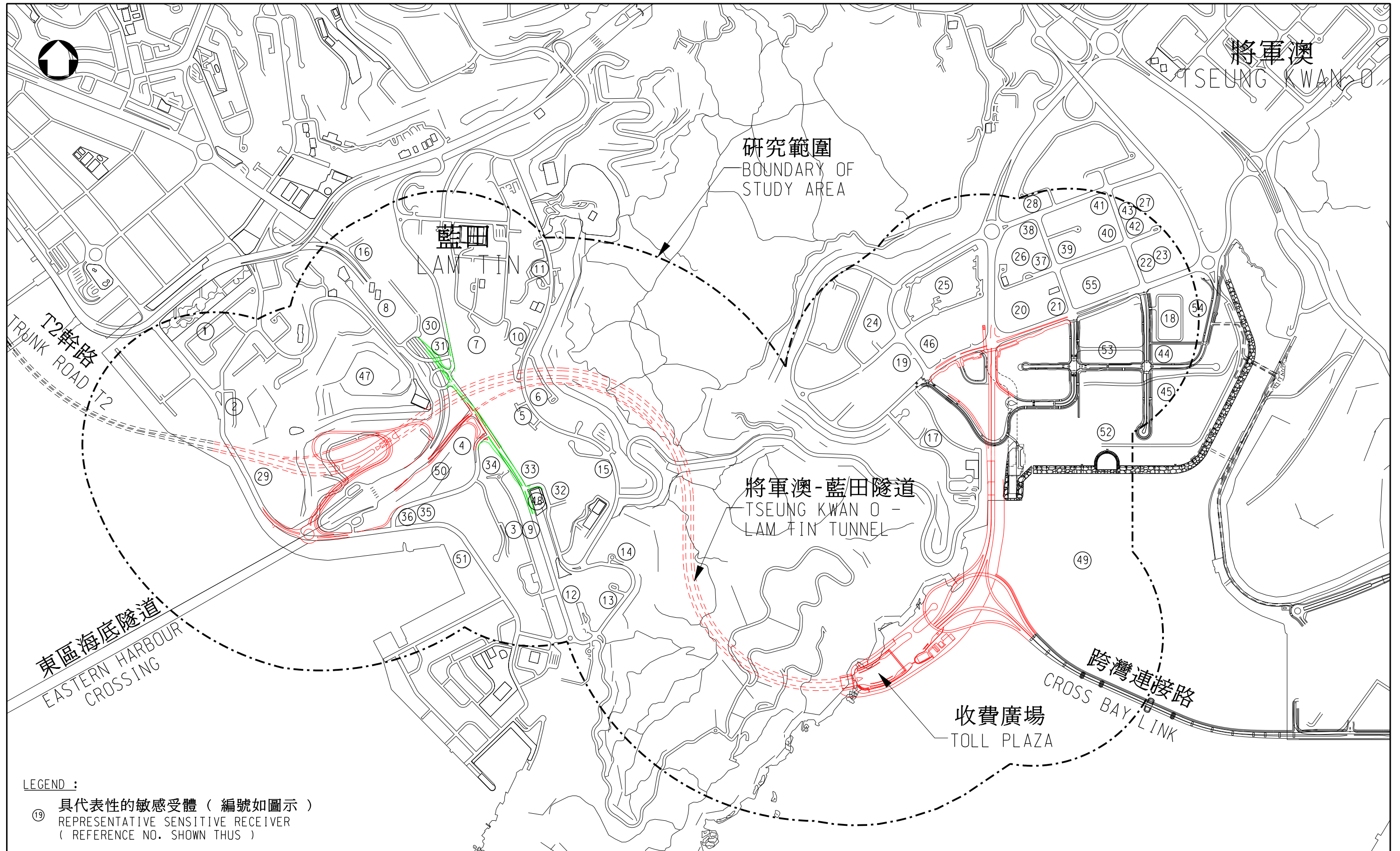
- training on landfill gas hazard for all maintenance workers inspecting any manhole or utilities services within the 250m Landfill Consultation Zone
- grouting to prevent leakage of leachate
- treatment of leachate and disposal, if necessary

6. USE OF PREVIOUSLY APPROVED EIA REPORT


- 6.1** The TKO-LT Tunnel (formerly known as Western Coast Road) is one of the DPs included in the approved EIA Report of the TKO Study which was approved on 8 Dec 2005 under Schedule 3 of the EIAO with Register No. AEIAR-092/2005. The approved Schedule 3 EIA for the TKO Study has assessed the cumulative impacts of the proposed projects in TKO, including TKO-LT Tunnel, Cross Bay Link and other developments in TKO. This approved EIA Report will be referred to in the present study.
- 6.2** The EIA Report on Lei Yue Mun Road Underpass, Modification at Junction with Yau Tong Road and Associated Improvement Works with Register No. AEIAR-056/2001 was approved on 21 Feb 2002. This approved EIA Report will also be referred to in the present study.



| | | | | | |
|--|------------|------------|------------|---------------|--|
| 圖則名稱 drawing title 將軍澳-藍田隧道及相關工程 - 位置圖 TSEUNG KWAN O - LAM TIN TUNNEL AND ASSOCIATED WORKS - LAYOUT PLAN | 繪圖 drawn | 簽署 initial | 日期 date | 項目編號 item no. | 辦事處 office 新界東拓展處 NEW TERRITORIES EAST DEVELOPMENT OFFICE |
| | Y W LO | SIGNED | 15.7.08 | 823TH | |
| | 核對 checked | 簽署 initial | 日期 date | 比例 scale | 圖則編號 drawing no. TKZ0567 |
| C H CHAN | SIGNED | 15.7.08 | 1 : 13 500 | | |
| 核准 approved | 簽署 initial | 日期 date | | | |
| C K CHU | SIGNED | 15.7.08 | | | |



LEGEND :
 ① 具代表性的敏感受體 (編號如圖示)
 REPRESENTATIVE SENSITIVE RECEIVER
 (REFERENCE NO. SHOWN THUS)

| | | | | | |
|--|------------|------------|------------------|---------------|--|
| 圖則名稱 drawing title 現有和規劃的主要敏感受體-位置圖 MAJOR EXISTING AND PLANNED SENSITIVE RECEIVERS - LOCATION PLAN | 繪圖 drawn | 簽署 initial | 日期 date | 項目編號 item no. | 辦事處 office 新界東拓展處 NEW TERRITORIES EAST DEVELOPMENT OFFICE |
| | Y W LO | SIGNED | 15.7.08 | 823TH | |
| | 核對 checked | 簽署 initial | 日期 date | 比例 scale |  土木工程拓展署 CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT |
| C H CHAN | SIGNED | 15.7.08 | 1 : 13 500 | | |
| 核准 approved | 簽署 initial | 日期 date | 圖則編號 drawing no. | | |
| C K CHU | SIGNED | 15.7.08 | TKZ0568 | | |