

**DD-901 West Rail
Environmental Support Services**

Essential Public Infrastructure Works
Yuen Long, Tin Shui Wai, Tuen Mun Centre and Eastern Access Road

Final EIA Report - Executive Summary

28 September 1999

For and on behalf of ERM-Hong Kong, Ltd

Date: 28 September 1999

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1. INTRODUCTION

1.1 Preamble

The Kowloon-Canton Railway Corporation proposes to undertake highway realignments to accommodate the new West Rail development. These Essential Public Infrastructure Works (EPIWs) are required in connection with the new stations at Yuen Long, Tin Shui Wai, Tuen Mun Centre and Kam Tin. These EPIW works are classed as ‘Designated Projects’ under Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO), and therefore require an Environmental Impact Assessment (EIA) to be undertaken to determine the nature and extent of any environmental impacts arising from the construction and operation of the EPIW’s, and to provide recommendations on appropriate measures to mitigate any associated impacts.

This Executive Summary highlights the issues of concern to the community and defines the recommended mitigation measures. The residual environmental impacts that remain after the implementation of the recommended mitigation measures are also defined.

1.2 Approach to Study

This EIA Report was undertaken to the requirements of the Study Brief issued by the Environmental Protection Department (EPD), and in accordance with the EPD’s Technical Memorandum on Environmental Impact Assessment Process.

Detailed assessments have been undertaken to predict the noise and operational air quality impacts using modelling and assessment methodologies approved by the EPD. As the proposed EPIWs are all located within the Study area of the previous EIA Report that was produced to assess the impacts from the construction and operation of the West Rail Project, the potential water quality, waste management and cultural impacts have been considered qualitatively by drawing upon this earlier report. Assessments have also been undertaken to determine the potential ecological impacts and land contamination issues which may arise during the construction and operation of the Eastern Access Road (EAR). Similarly, use has also been made of the EIA Report for the Tin Shui Wai Development Areas, produced by Binnie Consultants Limited.

1.3 Study Area

The scope of the project involves the improvement of existing highways in the town centres of Yuen Long, Tin Shui Wai, Tuen Mun and the construction of a new access road to Kam Tin Station. These works are required to enhance the effectiveness of the existing highway network and facilitate planned and localised growth associated with the future public use of the West Rail stations.

The EPIWs comprise the following works:

Yuen Long EPIW

The existing Long Yat Road will be re-aligned to provide access to the Yuen Long Station and Public Transport Interchange, with Roads L1, L2, L3 and associated junctions being constructed prior to the re-alignment of Long Yat Road. The extent of the proposed works at Yuen Long are shown in *Figure 1.3a*.

The preliminary works programme envisages a construction period from February 2000 to January 2001, although, this is subject to change.

Tin Shui Wai EPIW

The junction of Tin Fuk Road and Ping Ha Road will be moved slightly to the north, with additional road re-alignment and widening anticipated to provide better access to the new West Rail Station. Tin Yiu Road will also be modified as part of the realignment works. The extent of the proposed works at Tin Shui Wai are shown in *Figure 1.3b*.

The preliminary works programme envisages a construction period from October 1999 to October 2000, although, this is subject to change.

Tuen Mun Centre EPIW

The existing roads and junctions at Tuen Mun Heung Sze Wui Road, Yan Ching Street, Pui To Road and Ho Pong Street will be widened, to either two, three or four lanes in both directions. The extent of the proposed works at Tuen Mun Centre are shown in *Figure 1.3c*.

The preliminary works programme envisages a construction period from June 2001 to June 2003, although, this is subject to change.

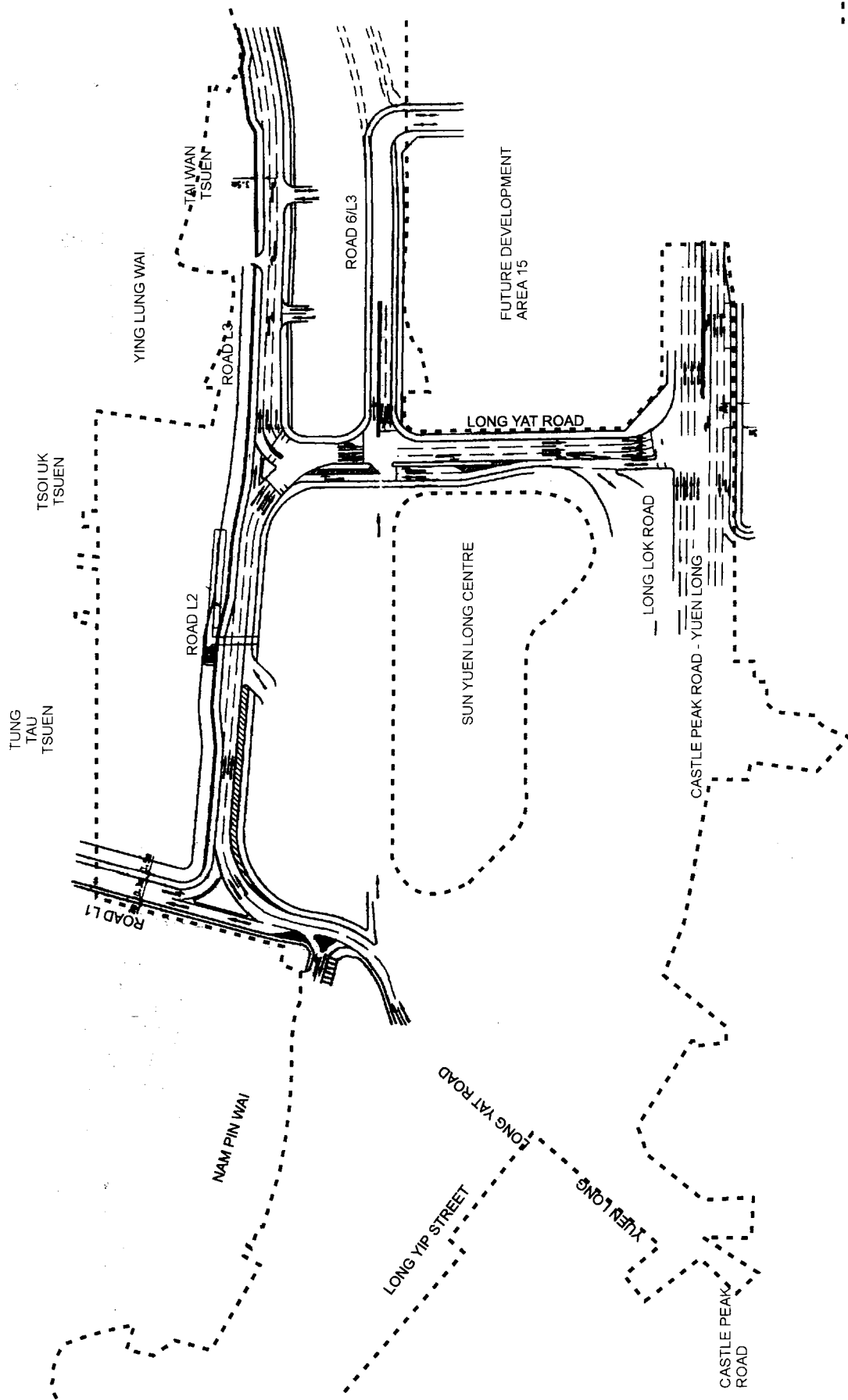
Kam Tin (Eastern Access Road) EPIW

The scope of the project involves the construction of a new dual carriageway connecting the West Rail Kam Tin Station, and associated Public Transport Interchange and park and ride facilities, to Kam Sheung Road and the Kam Tim Bypass. The Eastern Access Road will be constructed primarily at-grade but will have two bridges over the two branches of the proposed drainage channels. A roundabout will be provided adjacent to the station as part of the Kam Tin Station works. The extent of the proposed works at Kam Tin are shown in *Figure 1.3d*.

The preliminary works programme envisages a construction period from June 2001 to January 2003, although, this will be subject to change.

1.4 Structure of the Executive Summary

After this introductory section, the remainder of the report is arranged as follows:



KEY
--- WEST RAIL
GAZETTED
BOUNDARY

NOT TO SCALE



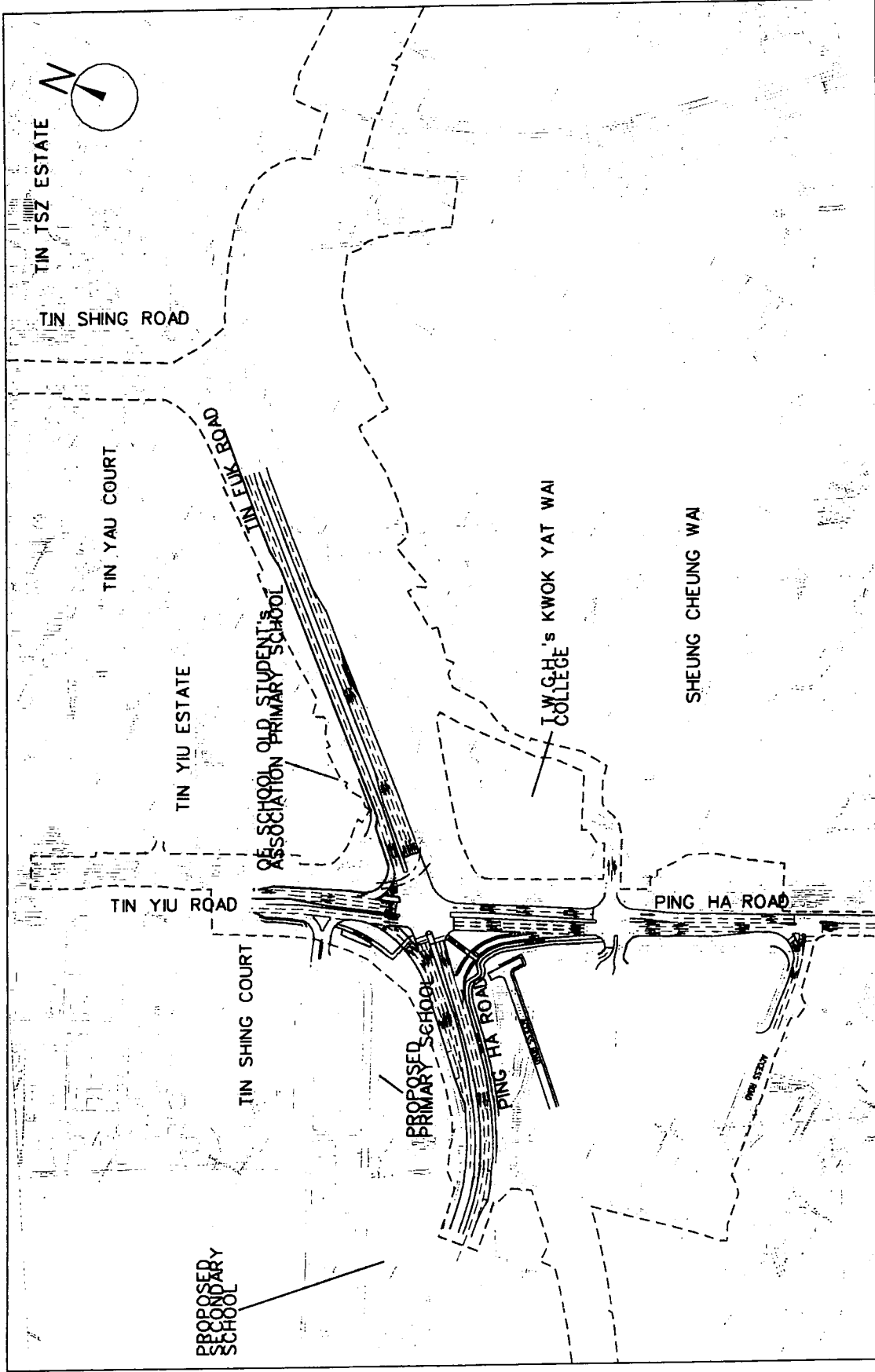
FIGURE 1.3a

EXTENT OF ROAD WORKS PROPOSED FOR YUEN LONG

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WEST RAIL GAZETTED BOUNDARY

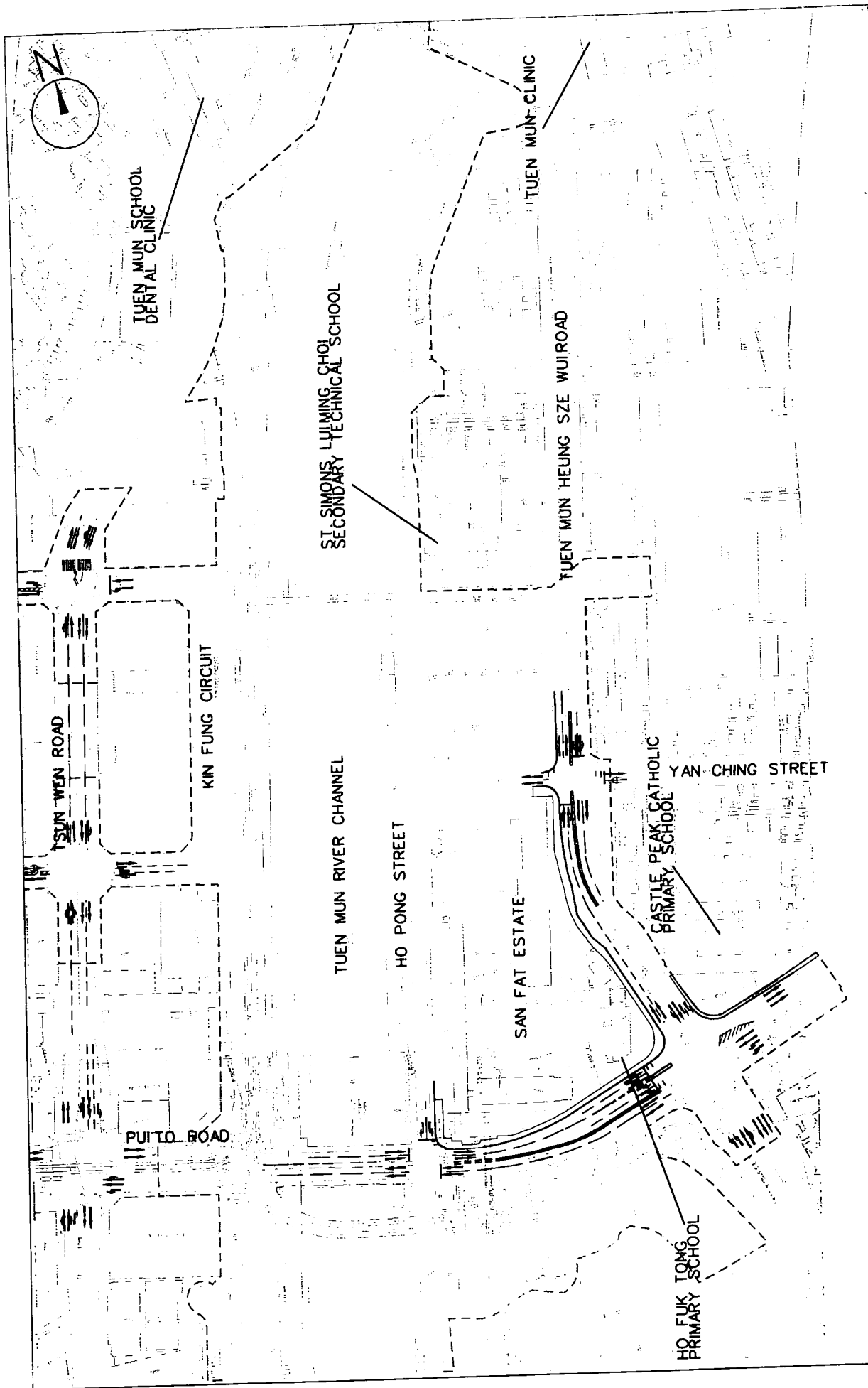
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EXTENT OF ROAD WORKS PROPOSED FOR TIN SHUI WAI FIGURE 1.3b

SCALE: 1/5,000

WEST RAIL GAZETTED BOUNDARY



WEST RAIL
GAZETTEAL
BOUNDARY

EXTENT OF ROAD WORKS PROPOSED FOR TUEN MUN CENTRE
FIGURE 1.3c

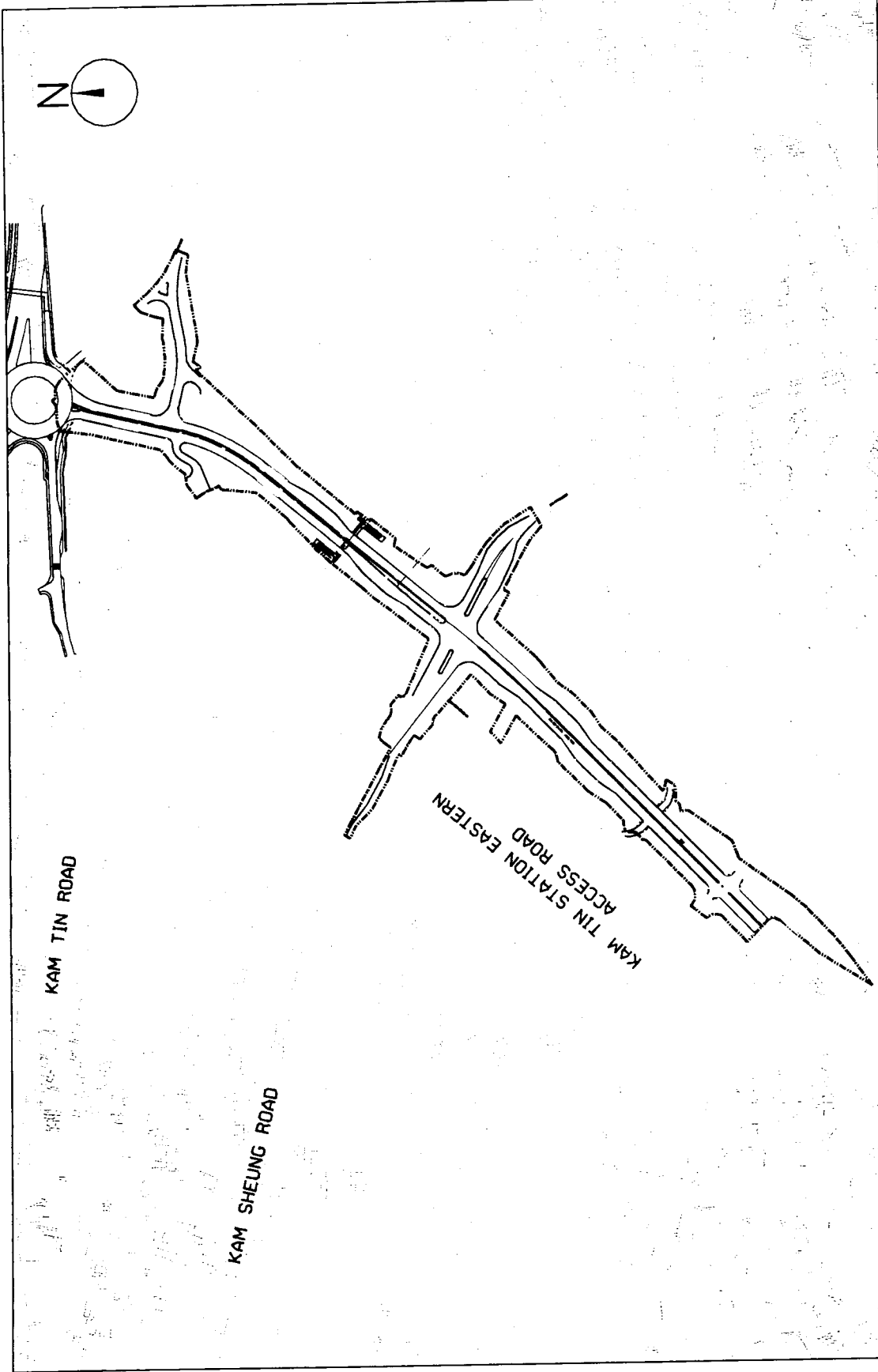
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FIGURE 1.3d

EXTENT OF ROAD WORKS PROPOSED FOR KAM TIN

--- WEST RAIL
GAZETTED
BOUNDARY

SCALE: 1/5,000

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- *Section 2* described the identified impacts arising from the construction works for the Project;
- *Section 3* described the identified impacts arising from the operation of the Project; and
- *Section 4* discussed the implementation requirements during the construction and operational phases of the Project.

2. CONSTRUCTION PHASE

2.1 Noise

2.1.1 *Baseline Conditions*

The existing ambient noise profile for each of the EPIW Study areas is dominated by local road traffic. Based on the general trend in Hong Kong for traffic flows to grow in the future, the existing noise baseline (i.e. without the EPIWs) would be likely to increase.

At Yuen Long, Tin Shui Wai and Tuen Mun there are no major fixed industrial noise sources, although, the existing LRT lines do make a contribution to the existing noise baseline conditions. However, at Kam Tin there are three industrial facilities located along the proposed route which do make a minor contribution to the existing noise baseline conditions.

2.2 Construction Noise Impacts

Unmitigated construction noise is predicted to give rise to exceedances of the daytime noise criteria at most of the NSRs in Yuen Long, Tin Shui Wai, Tuen Mun Centre and Kam Tin, due to excavation works and road paving during various stages of road construction.

Noise emissions can be minimised through the implementation of good site practices, the use of quiet plant and temporary noise barriers, by reducing the amount of time that noisy equipment is in operation and by prohibiting the occurrence of simultaneously noisy construction activities on site. These methods will be effective in providing an overall reduction in construction noise levels at most of the NSRs.

The EIA has, within the realms of the currently assumed construction scenario, considered all practicable means of mitigating the construction noise. However, residual noise impacts still exist. As a potential means of eliminating these residual impacts, it is recommended that the Contractor responsible for the construction works undertakes a thorough review of his working practices and construction methodology, and that he develops and implements an effective Environmental Management Plan during the construction phase in order to ensure that no unacceptable noise impacts arise from the Project.

2.3 Air Quality

2.3.1 *Baseline Conditions*

The existing landuses within the study areas of Yuen Long, Tin Shui Wai, and Tuen Mun Centre include residential developments, schools and industrial premises. Recreational uses are also found in Tuen Mun. In Kam Tin, the surrounding landuses include

agricultural land, residential, industrial and open storage areas. The monitored air quality data at each location are classified within the Rural/New Development categories.

2.4 Air Quality Impacts

The major dust generating activities in association with the works have been identified to be material handling, top soil removal and wind erosion. It was envisaged that as the volume of material to be handled on site and the excavation rate for road construction would be low, adverse dust impacts on the nearby Air Sensitive Receivers are not expected.

Implementation of generic air pollution control measures and compliance with the Air Pollution Control (Construction Dust) Regulation at the works sites will minimise potential dust nuisances arising from the works.

There is the potential for cumulative construction dust impacts to occur especially as a result of the West Rail (Phase I) construction works taking place concurrently with the EPIW related works. However, this potential source of impact has been assessed and it is predicted that the cumulative impact will be within the required dust criteria at all the air sensitive receivers located in the vicinity of each of the EPIW worksites. As a consequence, no adverse cumulative air quality impacts are predicted to affect the local community.

2.5 Water Quality

2.5.1 Baseline Conditions

In general, the streams in the vicinity of the EPIWs are generally grossly polluted. The water quality of Yuen Long Creek and Kam Tin River has been classed as 'bad' to 'very bad' while that of Tin Shui Wai nullah, has improved recently and, in 1997, was classified as 'good'.

There are no ground water abstraction within the study area.

2.5.2 Water Quality Impacts

No insurmountable water quality impacts are likely during the construction and operation of the EPIWs provided that the recommended mitigation measures are implemented.

2.6 Landscape and Visual Impact

Landscape and visual impacts during the construction phase will primarily comprise the physical impact and visual intrusion of the construction works themselves, and potentially dust may affect adjacent landscape elements. The conservation and re-use of topsoil and the transplantation of existing site trees to permanent amenity sites should be undertaken to mitigate landscape impacts. In order to mitigate the visual impacts, it is recommended that site hoardings should be erected to screen the works areas, and that consideration

should be given to the design and surface treatment of the hoardings particularly adjacent to pedestrian environments, similarly, site lighting should be controlled to minimise disturbance to local residents.

2.7 Waste Management

The key to minimising the impact of construction waste is through the implementation of a waste management plan, which provides effective management of chemical/industrial and other potentially hazardous wastes, and a strong preference for reuse rather than landfill disposal. Potential impacts can be avoided and controlled to acceptable levels provided that the recommended waste management methods and practices are implemented.

2.8 Land Contamination

An assessment of the potential for soil and groundwater contamination was undertaken for the EAR. The results of which identified a number of sites where current or historic land uses had the potential to give rise to contamination within the proposed worksite. However, since there has been very little substantial industrial usage of land within the works area, the overall contamination concerns are not considered to be significant.

As landuses have been identified which have the potential to give rise to land contamination concerns, a Contaminated Assessment Plan (CAP) has been submitted to the EPD for approval, in order to ensure that a proper site investigation is undertaken and evaluated. The findings of the site investigations will be reported in the Contaminated Assessment Report (CAR)

2.9 Ecological Resources

The proposed EAR will encroach into a mosaic of disturbed or artificial habitats which are generally of low ecological value. Given that the area of ecological habitat is quite small, no adverse impacts are anticipated during either the construction phase of the project.

2.10 Cultural Heritage

Other than the Tsui Shing Lau Pagoda in Tin Shui Wai and part of the Ping Shan Heritage Trail, no other archaeological or cultural resources are known to be within the study area of the Yuen Long, Tin Shui Wai and Tuen Mun Centre EPIWs. Provided that the recommended mitigation measures are adopted during the construction phase, no impacts are likely to the Pagoda or the Ping Shan Heritage Trail.

Following the gazettal of the alignment of the Eastern Access Road, and in advance of the construction works, it is recommended that archaeological field evaluation is undertaken to determine the presence and preservation of buried archaeological deposits. The field evaluation will be undertaken to a Field Evaluation Project Design to be submitted to the

Construction Impacts

Antiquities & Monuments Office for approval. The findings of the field evaluation will determine the need for further mitigation of impacts to archaeological resources.

3. OPERATIONAL PHASE

3.1 Noise

Operational noise levels have been assessed according to the procedures defined by the EIAOTM. A worst case prediction of future noise levels for the prerequisite 15 year future has been undertaken as well as an assessment of noise levels in the present year which is prior to the commencement of construction works on site.

Current noise levels at most of the Noise Sensitive Properties, including residential accommodation and schools, already exceeded the acceptable criteria defined by the EIAOTM. In the future, traffic flows at each of the proposed EPIWs will increase and adversely affecting the local community. The application of the EIAOTM procedures during the planning and design phases of the EPIWs will ensure that all adverse noise impacts are adequately mitigated to within the acceptable criteria. To achieve full compliance with the requirements, a series of mitigation measures will be required. These include direct technical remedies such as noise barriers where spatial, engineering and traffic safety constraints permit, the use of low noise road surfacing and the localised application of indirect technical remedies such as noise insulation, where the use of direct remedies have been proven to be exhausted. The findings of the recommended measures are summarised below.

Yuen Long

Roadside barriers are proposed for Nam Pin Wai village. Noise insulation is recommended for the proposed property developments in Areas 12 and 15 and the existing Sun Yuen Long Centre. Since other measures to control noise from Long Yat Road and Castle Peak Road will either be ineffective or impractical on grounds of fire safety, these noise sensitive premises have been proved to be eligible for noise insulation.

Tin Shui Wai

Noise barriers are recommended along Ping Ha Road and Tin Fuk Road to address road traffic noise. To further reduce traffic noise nuisance, low noise road surfacing is proposed for Tin Fuk Road, Tin Yiu Road and Ping Ha Road West. Noise insulation is required to address the residual noise impact predicted at QE School Old Student's Association Primary School in association with the Project as the use of direct measures was proved to be exhausted.

Tuen Mun

No mitigation measures have been proposed as noise impacts associated with the Project are limited.

Kam Tin (EAR)

Roadside barriers will be used along the EAR and Kam Sheung Road to protect the noise sensitive premises. After exhausting all possible forms of direct control measure, noise insulation is proposed for Lutheran Kam Sheung Church, Kam Kwong Kindergarden, and the village house of Ng Ka Tsuen as road traffic noise from the Project will adversely affect these premises.

In summary, it is anticipated that with the implementation of the noise control measures proposed in the EIA, there will be no adverse noise impacts, and that the scheme will be compliant with the noise requirements of the EIAOTM.

3.2 Air Quality Impacts

As traffic levels will increase following the opening of the West Rail Yuen Long, Tin Shui Wai, Tuen Mun Centre and Kam Tin Stations, an assessment of vehicular exhausts was undertaken to assess the potential air quality impacts. The assessment used an approved EPD model to predict levels of major pollutants at adjacent sensitive premises. Cumulative effects of new roads in the area were also assessed.

The assessment indicated that for each of the EPIWs, the air quality levels at the identified sensitive premises would be within the required criteria. Consequently, there should be no adverse impacts to the local community. No mitigation measures are necessary.

3.3 Water Quality Impacts

No water quality impacts are expected during the operational phase of EPIWs.

3.4 Landscape & Visual Impacts

Assessments of the landscape and Visual Impacts were undertaken for each of the EPIWs. The findings are summarised below.

Yuen Long

Landscape impacts will include the loss of open land, a children's playground and some mature trees. As the works comprise mostly alterations to an existing road, the impacts are generally not considered significant. The proposed landscape mitigation measures will include transplanting existing trees to compensatory planting sites, undertaking compensatory tree and shrub planting, and the reprovisioning of the children's playground.

Mitigation measures to control visual impacts will include the sensitive design of the noise barrier, and the implementation of amenity roadside tree and shrub planting to provide screening of the road alignment and associated structures.

It is considered that the landscape and visual impacts are acceptable with the recommended mitigation strategies.

Tin Shui Wai

Sources of landscape impacts at Tin Shui Wai during the operational phase include the loss of vegetation including mature trees and shrubs, whilst the visual impacts include the increased road area and traffic, the introduction of the noise barriers and highway structures (eg safety barriers, signage) and vehicular and street lighting.

The landscape impacts will be relatively minor due to the scale of the existing road layout and junction. However, the introduction of the noise barriers will substantially alter the character of the local environments for pedestrians. The proposed landscape mitigation measures include the retention, where possible, of existing mature vegetation, the transplanting of existing trees to compensatory planting sites, and compensatory new tree and shrub planting.

Mitigation measures to control visual impacts will include the sensitive design of the noise barriers, and the implementation of amenity roadside tree and shrub planting to provide screening of the road alignment and associated structures.

During the operational phase the most significant residual impacts will be that experienced by pedestrians and cyclists adjacent to the noise barriers.

Tuen Mun

Landscape impacts at Tuen Mun during the operational phase will comprise the loss of mature vegetation, whilst visual impacts will result from the slightly increased road area and increased traffic, the introduction of new highway structures (eg safety barriers, signage) and vehicular and street lighting.

Landscape and visual impacts will be relatively minor. The proposed landscape and visual mitigation measures will include the retention, where possible, of existing mature vegetation, the transplanting of existing trees impacted by the works, and compensatory new tree and shrub planting. The residual impacts will be the loss of mature vegetation and seating areas.

Kam Tin

Landscape impacts within the study area will be primarily concerned with the loss of active agricultural land and mature trees in the vicinity of the Kam Tin River. Whilst there is the potential for mitigation measures to be undertaken in these areas, it would appear that there is insufficient land allocated for tree and shrub planting, and so negative impacts are expected.

The primary source of visual impacts will result from the construction of the noise barriers. It is considered that the scale and distribution of barriers will cause substantial

negative impacts on the key VSRs, as well as further reducing the landscape quality of the area.

Mitigation of these landscape and visual impacts is considered to be acceptable with mitigation measures, as stated in Annex 10 of the Technical Memorandum on the EIAO.

3.5 Waste Management Impacts

No impacts are expected during the operational phase.

3.6 Land Contamination

No impacts are expected during the operational phase.

3.7 Ecological Resources

No impacts are expected during the operational phase.

3.8 Cultural Heritage Impacts

No impacts are expected during the operational phase.

4. FUTURE REQUIREMENTS

4.1 Environmental Monitoring and Audit

To ensure that the mitigation measures recommended within the EIA Report are carried forward and implemented at the appropriate stage of the project, an Implementation Schedule has been produced. For each of the mitigation measures the Implementation Schedule defines the stage and location at which the measure should be implemented together with the responsible agent. An Environmental Management System has also been proposed as a means of ensuring the full implementation of the mitigation measures.

It is recommended that monitoring is undertaken to assess the effectiveness of the mitigation measures. During the construction phase, environmental monitoring will be required at locations adjacent to each of the EPIWs to monitor noise and dust generated from construction activities. Vibration monitoring will also be undertaken at Tin Shui Wai to ensure that there is no damage to the adjacent Pagoda.

During the operational phase, traffic noise will be monitored within the first year to ensure the effectiveness of the recommended mitigation measures. A maintenance schedule will also be defined for the noise barriers and low noise road surfacing to ensure that they remain effective.