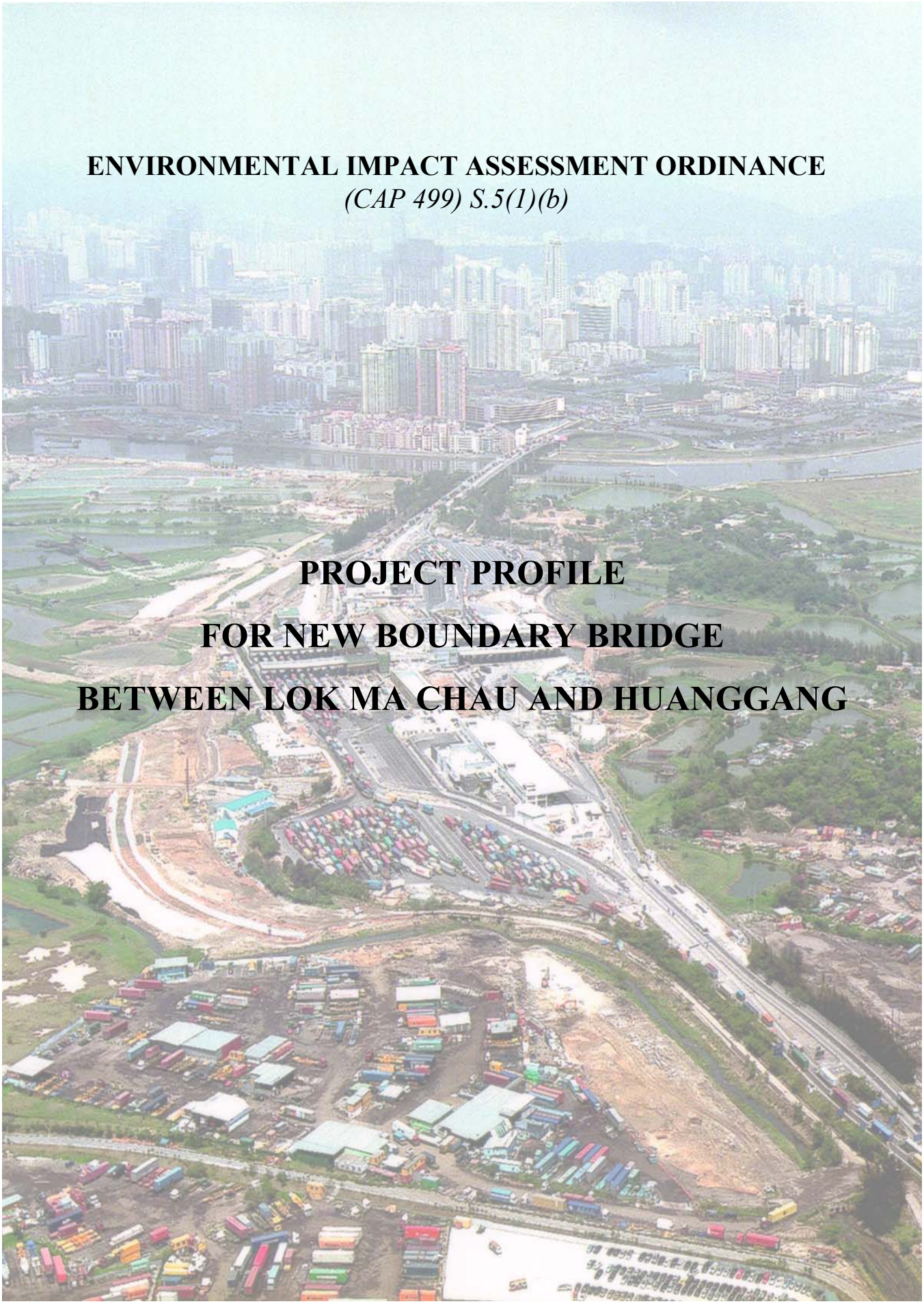
ENVIRONMENTAL IMPACT ASSESSMENT ORDINANCE

(CAP 499) S.5(1)(b)



PROJECT PROFILE

FOR NEW BOUNDARY BRIDGE

BETWEEN LOK MA CHAU AND HUANGGANG

ENVIRONMENTAL IMPACT ASSESSMENT ORDINANCE
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ENVIRONMENTAL IMPACT ASSESSMENT ORDINANCE (CAP 499) S.5(1)(b) PROJECT PROFILE FOR NEW BOUNDARY BRIDGE BETWEEN LOK MA CHAU AND HUANGGANG

A. BASIC INFORMATION

a. Project Title:

New Boundary Bridge between Lok Ma Chau and Huanggang

b. Purpose and nature of the project:

The Lok Ma Chau Boundary Crossing was opened in 1989 and has since served as a major road link between Hong Kong SAR and Shenzhen. The existing boundary bridge between Lok Ma Chau and Huanggang, as shown in Figure 1.1, 1.2 and 1.2a, provides two traffic lanes in each direction. For traffic management and clearance operation reasons, one traffic lane is designated for goods vehicles and the other is used for passenger vehicles. Due to the substantial growth in cross boundary traffic demand in recent years, the traffic lane for goods vehicles has reached its capacity during peak hours. Shared use of the passenger vehicle lane by goods vehicles has been introduced on an ad-hoc basis. However, this causes unnecessary delay to passenger vehicles and is not recommended as a regular measure.

The purpose of this project is to provide a new vehicular bridge across Shenzhen River (immediately east of the existing bridge crossing) from the existing Lok Ma Chau Control Point to the Huanggang Interchange and its Control Point to meet the future growth in demand for both goods vehicles and passenger vehicles. The provision of the new bridge will also enhance traffic management and facilitate the temporary closure of traffic lane for maintenance of the bridges.

As the new boundary bridge will straddle over the land boundary between the Mainland and the Hong Kong Special Administrative Region (HKSAR), the government of the HKSAR will be responsible for implementing the section of the boundary bridge within its boundary. But cooperation between the two governments will be exercised to smoothen up the design and construction matters.

c. Name of Project Proponent

Major Works Project Management Office, Highways Department

d. Location and Scale of Project and History of Site

Figure 1.3 shows the bird's-eyes view of the site with the Project works limit marked.

Location

The project works are located within the existing Lok Ma Chau and Huanggang Control Points with the new bridge across the Shenzhen River east of the existing bridge. Starting from the south, two new single two-lane roads will be constructed at grade off the Lok Ma Chau Control Point and go northwards to the east of the existing boundary bridge. They will pass through the existing Lok Ma Chau Control Point Bridge Office, which will be demolished under this project and join with the new bridge crossing over Shenzhen River via a section of dual two-lane approach ramps. The structural form and layout of the columns and foundations of the ramps will be more or less similar to those of the existing structures.

The bridge over Shenzhen River will be a new dual two-lane three-span concrete bridge located immediately to the east of the existing bridge. Again the structural form and location of supports will be identical to those of the existing bridge to maintain the aesthetic appearance and to minimize the impact to the environment. After the bridge reaches the other bank, slip roads will be provided to join with the existing Huanggang interchange and its Control Point.

Scale of the Project

Figure 2.1 shows the general layout of the proposed works. The project will comprise the following major engineering works:

- Construction of a new bridge, about 95m long within the HKSAR boundary, connecting to the new bridge on the Mainland side to carry a dual two-lane carriageway road across the Shenzhen River (Figure 2.2). Each carriageway shall consist of two 3.65m wide traffic lanes with a 0.5m marginal strip on both sides and a 2.0m verge (footpath) at the far side together with 0.9m high concrete profile barriers at both edges.
- Construction of associated road connections at Lok Ma Chau including two single two-lane approach ramps about 400m long, and an overbridge about 120m long, for grade-separating the vehicular traffic from the existing bridge to the Lok Ma Chau Control Point from the ground level traffic to suit the new traffic arrangement (Figure 2.3). Same concrete profile barriers of 0.9m height shall be provided for the approach

viaducts and the overbridge.

- The demolition of the existing Lok Ma Chau Control Point Bridge Office.
- The diversion of Ha Wan Nullah to the San Tin Eastern Main Drainage Channel to facilitate the construction of the approach viaduct (Figure 2.4).

The project is anticipated to be implemented under a fast track programme, with the tentative date for commencement and completion of the project in the fourth quarter of 2003 and end of 2004 respectively.

History of the Site

Historically the Lok Ma Chau Boundary Crossing and the nearby land have been used as commercial fishponds since their conversion by the local population from the marsh that once occupied the historical shoreline. Some of the former fishpond areas have been used for building roads leading to the Lok Ma Chau boundary crossing and for container storage activities.

e. Name and Types of Designated Projects

The proposed project is a designated project comprising road and bridge construction as defined under Schedule 2, Part I, Category A.8 and Q.1 of the Environmental Impact Assessment Ordinance.

f. Name and Telephone of Contact Person

This project will be managed by the Major Works Project Management Office, Highways Department. All queries on the project within the HKSAR side can be addressed to:

Mr. Peter S. L. LAW	Senior Engineer
	Major Project Management Office
	Highways Department
Contact Telephone	2762 3629

B. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

a. Planning and Implementation

The project will be managed by the Major Works Project Management Office, Highways Department. Highways Department will provide engineering conceptual designs. All detailed design and construction works are to be

provided by the Contractor under the Design and Build contract.

b. Project Programme

Construction work is planned to commence in the fourth quarter of 2003 for completion by end 2004.

c. Project Interfaces

The project shall take cognizance of the following interfaces:

- Expansion of Kiosks and Other Facilities at Lok Ma Chau Boundary Crossing

  The expansion works are programmed for completion in September 2003 prior to the commencement of the new boundary bridge project.

- Sheung Shui to Lok Ma Chau Spur Line

  The proposed KCRC Spur Line project commenced in December 2002 and will be completed by late 2006. Arrangements have to be made with KCRC to ensure that the viaduct above the Lok Ma Chau Control Point would be completed around April 2004 and a portion of KCRC Spur Line site could be made available for the construction of the approach ramps and associated works by Highways Department.

- San Tin Eastern Main Drainage Channel

  The drainage project commenced in October 2002 and scheduled for completion by June 2006. Arrangements will be made with DSD to allow access to their site for of the diversion of the Ha Wan Nullah

- KCRC Lok Ma Chau Terminus

  This project, being part of the Sheung Shui to Lok Ma Chau Spur Line project, has commenced in September 2002 and is anticipated to complete by 2006. Arrangement will be made with KCRC to ensure that part of the work site within the terminus contract will be made available for Highways Department to carry out the construction of the new boundary bridge.

C. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

a. Existing and planned sensitive receivers and sensitive parts of the natural environment

Residential developments and other air and noise sensitive receivers

There are no planned developments near to this section of the road within the HKSAR boundary except the new Sheung Shui to Lok Ma Chau Spur line and the proposed KCRC Lok Ma Chau Terminal. Three existing isolated villages, which are potential sensitive receivers, are close to the alignment but with a minimum distance of about 50m.

As the proposed works site of this Project will be located wholly within KCRC Spur Line scheme boundary, no extra land will be required for construction of the New Boundary Bridge. Also, the site is located adjacent to the San Tin Eastern Main Drainage Channel project. The proposed works site has already been disturbed by on-going construction activities.

Given the relatively high existing noise level at the Lok Ma Chau Control Point, it would be necessary to carefully evaluate the potential impact on the sensitive receivers caused by the additional bridge crossing. If necessary, direct or indirect mitigation measures should be recommended to minimise such impacts.

Shenzhen River

Shenzhen River is the major drainage channel for both Shenzhen and North West New Territories. DSD and the Shenzhen River Regulation Office (SZRRO) of Mainland jointly manage this River. Potential water sensitive receivers are located in the Shenzhen River. Water quality in the River and the nearby fishponds could potentially be impacted with increase in the level of suspended solids. The ultimate downstream receiving body is Inner Deep Bay.

Bridge piers to be built within the Shenzhen River will be of the same size as the existing piers and be located immediately adjacent to these piers. Permanent impact to the hydrology of the River due to these new piers is therefore expected to be minimal. Although the permanent impact of the new piers is considered small, the impact during construction of the piers may vary according to the construction method to be adopted.

Drainage Impact Assessment for the River is necessary for investigation of the temporary and permanent drainage impacts involving thorough modelling and

assessment, and necessary mitigation measures. This Assessment would have to be endorsed by both DSD and SZRRO. In order to minimize the impact during construction, it is recommended that the cofferdams for the piles and pile caps be constructed and removed within the dry season, i.e. 1st November to 15th March.

Watercourses and Nullahs

Ha Wan Nullah is the existing main drainage channel serving the Ha Wan Basin. It runs along the proposed alignment of the approach ramp leading to the Shenzhen River and will be directly affected by the proposed works. Diversion of the Ha Wan Nullah to the proposed Eastern Main Drainage Channel is recommended, as this requires minimum landtake and causes least disturbance to the adjoining area. As the Eastern Channel project is currently programmed for completion by 2006, therefore a temporary diversion scheme may be proposed, if necessary, for realigning the Ha Wan Nullah together with the outfall structure to the west of the existing boundary bridge. Wetland compensation areas will be provided by DSD on the eastern bank of the proposed channel and the connection of Ha Wan Nullah should be carefully located to avoid interfering the function of the wetland.

Ecologically Sensitive Areas

The ecologically important Mai Po Nature Reserve, Mai Po Inner Deep Bay Ramsar Site, Mai Po Village SSSI, Mai Po Marshes SSSI and Inner Deep Bay SSSI – are all located more than 1.3 km away from the proposed works site. The proposed works area is partly within the Wetland Buffer Area and the Wetland Conservation Area. It is also zoned as Conservation Area in the San Tin Outline Zoning Plan. Commercial fishponds are found in the Lok Ma Chau area to the east and west of the proposed works site but not in its immediate vicinity. It is anticipated that there would not be any significant ecological impacts arising from the proposed Project in these areas.

b. Major elements of the surrounding environment and existing and/or past land uses on site, which might affect the area in which the project is located

Close to Lok Ma Chau are several storage areas, some of which may have been contaminated. These past land-uses may present land contamination problems. However, the storage areas are outside the proposed works of the Project and hence do not fall within the scope of this study.

D. POSSIBLE IMPACT ON THE ENVIRONMENT

a. Outline of process Involved

Introduction

The section identifies the likely environmental impact of the proposed works in both the construction and operational phase.

b. Potential Environmental Impacts: Construction Phase

Air Quality

Potential air quality impacts mainly arises from the operation of construction plant and vehicles. During construction, dust levels may be high at some of the ASRs due to site clearance, excavation, cutting, material handling, stockpiling and construction vehicle movements associated with the construction of the bridge and its associated roadworks.

Noise

An assessment of the impacts arising from the construction of the project has been undertaken using conservative construction equipment schedules. The predictions indicated that during the daytime some activities would cause an exceedance of the noise criteria {$L_{Aeq,\,(30\ min)}$ 75 dB(A)} at some of the NSRs without mitigation measures. These include, amongst others, the use of heavy cranes, or contiguous bored piling. Major noise sources would be from the use of Powered Mechanical Equipment (PME).

Hydrology

The existing Ha Wan Nullah, which runs along the same alignment as the proposed approach viaduct to the new boundary bridge, if necessary, will be temporarily diverted to the west of the existing bridge prior to commencement of the bridge works and permanently connected to the San Tin Eastern Main Drainage Channel. Hence it is not expected that there will be any change in surface hydrology.

Water Quality

During the construction phase the key issue relating to water quality is the piling activities in Shenzhen River. Careful planning and appropriate construction method should reduce these impacts and it is expected that these can be minimized to acceptable level.

Waste

Generation of wastes during the construction phase includes surplus excavated and inert material; general construction waste; demolition waste; chemical waste and general refuse.

Hazards

There are no potentially hazardous installations, registered dangerous goods storage areas or landfills along the alignment and therefore no hazards are foreseen.

Ecology

Ecological Baseline -

A comprehensive literature review was carried out to collect the ecological baseline information of the Study Area which is defined as the area within 500m of the works site boundary. Several EIA studies carried out in recent years in the area have been reviewed, including:

i) Expansion of Kiosks and Other Facilities at Lok Ma Chau Boundary Crossing – Final Environmental Study Report (1999);
ii) KCRC Sheung Shui to Lok Ma Chau Spur Line EIA (Tunnel/Viaduct Option) – Final EIA Report (2002);
iii) Main Drainage Channels and Poldered Village Protection Scheme for San Tin, NWNT Environmental Impact Assessment Study – Final Assessment Report (2002); and
iv) Environmental Impact Assessment Study for Shenzhen River Regulation Project Stage 1 and 2 – Final EIA Study Report (1995)

In addition to the literature review, updated information about the study area is also made available from the Agriculture, Fisheries and Conservation Department.

Habitats within the Study Area include fishpond, woodland, plantation, grassland, agricultural field and developed area. A habitat map of the Study Area is shown in *Figure 1.4*. The fishpond is of ecological importance as the feeding habitat for waterbirds while other habitats are of low ecological importance because of their relatively young and modified nature. No protected plant species were recorded in the area. Birds are rich and diverse in the area but other fauna such as dragonflies, butterflies, fishes, amphibians,

reptiles and mammals are all common and widespread.

The potential impacts associated with the proposed works are discussed as follows:

Habitat Loss -
In order to avoid potential adverse ecological impacts to the Lok Ma Chau area, the approach of avoidance was adopted in the alignment selection and design of the bridge. To avoid impacting on the ecologically sensitive fishpond area at Lok Ma Chau, the proposed works site will be located wholly within the works area of the KRCR Spur Line project and the already developed and heavily disturbed area of the existing Lok Ma Chau Boundary Crossing. To the west of the works area is the works site for Eastern Main Drainage Channel, which is under construction. As a result, there is no wetland loss associated with the proposed works. There would only be loss of approximately 0.4 ha young plantation of low ecological values during construction. The plantation consists of two thin stripes of densely planted *Casuarina equisetifolia* and *Hibiscus tiliaceus*. Both species are common and widespread in Hong Kong and are frequently used in roadside plantation.

Fragmentation and Disturbance –
The proposed new bridge is located in a fragmented area and the degree of fragmentation would remain largely unchanged during the construction phase. Disturbance to wildlife in the works site would also be minimal as the works site is already highly disturbed due to the construction works nearby, the traffic flow of the San Sham Road and the operation of the existing Lok Ma Chau Boundary Crossing. Also, wildlife present in the works site and nearby area is scarce and disturbance tolerant.

Water Quality –
With the adoption of measures recommended to minimize impact on water quality in the Shenzhen River during the construction phase of the proposed new bridge, ecological impacts on downstream area in Mai Po and Inner Deep Bay mudflat are not expected.

Air Pollution –
Construction activities in the works area are expected to be minimal since the bridge components would be pre-fabricated as far as practical. The potential

ecological impacts of air pollution to vegetation and wildlife as a result of construction activities are minor and temporary in nature.

Cumulative Impact –
The construction period of the proposed new bridge would overlap with other concurrent projects (i.e. KCRC Spur line, San Tin EMDC) in the area. However, given the nature of the works and the small scale of the project and that the area is already highly disturbed, cumulative impact to the ecology of the area is expected to be insignificant. Conversely, the concurrence of construction of these projects would shorten the period of disturbance and hence minimize the overall impacts to the area.

Landscape and Visual Impacts
The landscape and visual impact during the construction of the project is expected to be minimal in view of the ongoing construction activities in the area.

Historical and Cultural Impacts
There are no major items of cultural heritage value that will be directly or indirectly affected by the works

Land Contamination
Disposal of potentially contaminated material is not expected.

c. Potential Environmental Impacts: Operational Phase

Air Quality
Vehicle emissions from the open road sections will be the main source of gaseous emissions. The assessment based on the worst scenario of 2006 traffic flow data predicted that the AQOs would be satisfied at all existing ASRs during operation, see Appendix A1 for details of assessment.

Noise
Road traffic noise from the open sections of the alignment would be the main source of noisy operations during the operational phase. Detailed assessment of the traffic noise based on CRTN procedure has predicted that the unmitigated road traffic noise levels at all the identified NSRs would not exceed the relevant planning standards of 70 dB(A) and is comparatively less than the prevailing traffic noise level of 71 dB(A), i.e. the total traffic noise

level before the works to be constructed are commenced. This is due to the introduction of confined vehicular concrete parapet at the edge of the new bridges and the approach ramps. For details of the assessment of noise impacts, please refer to Appendix A2 attached.

Hydrology

There should not be any changes to surface hydrology associated with the operational of the road.

Water Quality

As the proposed bridge columns are similar in size to the existing column supports and located immediately next to the existing columns, there should not be any change in the cross-sectional area of the Shenzhen River and hence no residual water quality impacts are expected. Details of the assessment of water and ecology are attached in Appendix A3.

The additional sewerage arisen from the increase in (passenger) traffic at Lok Ma Chau has been assessed under the *Lok Ma Chau Kiosks* project by ASD. It is anticipated that the current Project will not bring with it any significant increase in sewerage discharge as this project involves essentially road works only and no other facilities that require sewerage provision.

Waste

Operational impacts from the proposed road will be minimal.

Hazards

There is no hazard associated with the operation of the road.

Ecology

Ecological Barrier –

The proposed new bridge will slightly increase the effect of ecological barrier at San Sham Road. However, the present alignment, which is within the Lok Ma Chau Control Point and San Sham Road and next to the existing boundary bridge over the Shenzhen River, has minimized the barrier effect of the operation of the new bridge. Taking into account the low ecological value and fragmented state of the works site, this impact is considered insignificant.

Disturbance –

Being adjacent to the existing bridge and equipped with road parapet, the

additional traffic and noise brought about by the operation of the new bridge would not significantly increase the degree of disturbance present in the area. Also, the wildlife present in the area is disturbance tolerant.

Hydrological Disruption –
The presence of the piers of the new bridge may potentially affect the water flow of the Shenzhen River and lead to increased sedimentation downstream at the Mai Po and Inner Deep Bay mudflat. This is minimized with location and alignment of the proposed bridge piers being parallel to those of the existing bridge and adoption of smaller piers as fas as possible. No impact on the ecology of the mudflat is expected due to the new bridge.

Landscape and Visual Impacts
About 260 trees of *Casuarina equisetifolia* and *Hibiscus tiliaceus* of small to medium size will be affected by the construction of the proposed new bridge and the potential temporary drainage diversion, covering an area of approximately 0.4 ha. Both species are common and widespread in Hong Kong and are frequently used in roadside plantation. The plantation density is quite high and condition and health of the trees are fair. Their amenity value is limited to act as a screen planting at the subject site. Undergrowth is sparse, consisting mostly of common species of weeds and grasses.

To provide a harmonious appearance, the aesthetic appearance of the new boundary bridge will be similar to that of the existing bridge. The visual impacts from this Project could be attributed to the felling of existing trees. However, the amenity value as a screening plantation in this small area is considered limited. To enhance visual appearance, it is proposed that compensatory plantation be provided. For those trees that are to be removed for the temporary diversion of the Ha Wan Nullah, new trees will be re-planted at the same locations when the land for the temporary drainage channel is reinstated to its original form. Native tree species will be used as far as practicable to enhance the ecological value of the area.

A tree felling application will be prepared and submitted to the relevant authority for approval. Compensatory planting will be carried out to mitigate the landscape impacts. Figure 3.1 shows a general view of areas where trees felling would be required. Figure 3.2a to 3.2c show a tree survey plan marking the trees likely to be affected by the proposed works.

Historical and Cultural Impacts

The operation of the road will not affect any major items of cultural heritage value.

Land Contamination

The new section of road will not give rise to any land contamination issue during its operation.

E. ENVIRONMENTAL PROTECTION MEASURES

a. Measures to minimize environmental impacts

The major environmental issues and potential mitigation measures are summarized in the following paragraphs:

Design Stage

Avoiding and minimizing potential environmental impacts have been one of the key objectives throughout the conceptual design stage of this Project. To this end, the alignment of the proposed Crossing has been chosen with the following considerations:

- Where possible, avoid land-resumption thereby not causing further loss in important habitats in the vicinity;
- The new Boundary Bridge should be located as close to the existing Bridge as possible to confine any environmental impacts likely to arise from the Project to a minimum. Besides, future construction works will be carried out within an area already disturbed by other on-going construction activities;
- Any alignment east or west of the currently proposed one would, to a greater or lesser extent, infringe the above principle and may cause unnecessary disturbance to the local environment;
- The form and shape of the new structure should, as far as practical, resemble that of the existing structure to harmonise with the existing environment.

Construction Phase

Air Quality

The likely air quality impact arising from the construction of the proposed road alignment is related to dust nuisance, and gaseous emissions from the construction plant and vehicles.

Dust suppression measures set out in the *Air Pollution Control (Construction Dust) Regulations* should be followed by the contractor to control any

potential construction dust impact arising from the work. These typical control measures include:

- Impose on-site vehicle speed restrictions and wheel washing facilities at all site access points;
- All dusty materials should be sprayed with water immediately prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet;
- Where breaking of rock/concrete is required, watering should be implemented to suppress dust generation, water spray should be used during the handling of excavated material at the site;
- careful handling and the containment or damping of dusty material, and
- the load on vehicles should be covered entirely by clean impervious sheeting to ensure that the dusty material do not leak from the vehicle; and
- frequent watering or covering of exposed area of ground and prompt site restoration.

Noise

Construction noise could be controlled within the noise criteria by the use of quiet construction methods, quieter construction equipment and use of movable temporary noise barriers to contain noise from certain activities likely to general excessive noise level. A noise assessment has been carried out taking into account the tentative construction program, plant schedule, the location of the identified NSRs and other construction programmes in the vicinity. Analysis results show that the unmitigated noise level at the most affected NSR would be reduced from 85 dB(A) to 72 dB(A) (November 2003 to January 2004 at NSR-1) with implementation of mitigation measures.

Construction activities should be limited to daytime hours (0700-1900) Monday to Saturday only, otherwise a Construction Noise Permit must be obtained from EPD.

Good site practice and noise management can be effective in reducing the impact of construction site activities on nearby NSRs. Where applicable, the following control measures should be implemented to minimise construction noise levels:

- Only well-maintained plants should be operated on-site and plants should be serviced regularly during the construction period;
- Machines and plant (such as trucks) that may be intermittent use should be shut down between work periods or should be throttled down to a

minimum;

- Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction period;
- Mobile plant should be sited as far away from the NSRs as possible;
- Plants known to emit noise strongly in one direction should, where possible, be oriented so that noise is directed away from the nearby NSRs; and
- The use of quiet PME and reducing the number of PME operating at any one time.

Hydrology

The construction of the bridge piers in Shenzhen River is scheduled to be carried out only during the dry season (November to March) to avoid any potential disturbance to the hydrology of the River.

Water Quality

Water impact mitigation measures will include installation of appropriate drainage facilities to control site runoff (silt and oil traps), proper management on-site to prevent debris and harmful materials from reaching drainage facilities of water bodies, provision of adequate toilet facilities and proper disposal of sewage by a recognized waste disposal company.

Waste

Mitigation measures to control waste will include adoption of general good housekeeping practices, sorting and segregation of wastes for reuse and disposal, agreement with Civil Engineering Department on the allocation of space at a public filling area for the excavated materials, and the designation of specified access routes for disposal vehicles. It is considered that with measures such as good construction practices and proper waste management procedures, no adverse impact will be anticipated. As such, detailed waste management plan is not recommended.

Hazards

No mitigation is required as no impact is identified.

Ecology

At the conceptual and design stages of this Project, various considerations have been given to minimize ecological impacts through avoidance and

minimization. As a result, the proposed new bridge would cause insignificant ecological impacts for the following reasons:

1. Site Selection - the proposed new bridge is located in the existing KCRC works area and hence avoids posing additional impacts on other ecological sensitive/important areas such as fishponds in the area;
2. Land Requirement – the design of the bridge has minimized the area required (and hence potential habitat loss) to construct the proposed new bridge.
3. Alignment – the bridge is adjacent and parallel to the existing bridge, thus avoids causing potential impacts to the hydrology of Shenzhen River and disturbance to other ecological sensitive areas.
4. Implementation Programme – construction works will be carried out within the period of existing construction activities in the area so as to minimize overall disturbance to the area.

Mitigation measures for the road construction such as erecting fences along the boundary of construction sites before the commencement of works, and prohibiting and preventing open fires within the site boundary are recommended to avoid and minimize the potential impact to the environment. Residual impacts are expected to be minimal after implementation of the above measures.

Landscape and Visual Impacts

As the proposed works area is within the works site of the KCRC Spur Line and next to the San Tin Eastern DMC, the surrounding environment has already been disturbed visually. As such, it is expected that construction activities of this Project will result in minimal visual impacts. Compensatory planting will reduce the landscape impact as a result of the loss of 0.4ha plantation.

Historical and Cultural Impacts

No mitigation is required as no impact is identified.

Land Contamination

No mitigation is required as no impact is identified.

Operational Phase

Air Quality

No mitigation measures have been proposed.

Noise

Assessment results indicate that the noise impact arising from the operation of the Project will be within the planning standards, and hence no mitigation measures are proposed.

Hydrology

No mitigation is required as no impact is identified.

Water Quality

No mitigation is required as no impact is identified.

Waste

No mitigation is required as no impact is identified.

Hazards

No mitigation is required as no impact is identified.

Ecology

No mitigation is required as no significant impact is identified.

Landscape and Visual Impacts

Landscaping and planting will be implemented to minimise visual impacts. Compensatory planting, using mainly native species as far as practicable, would be proposed to mitigate the landscape impacts resulting from the loss of 0.4ha plantation. The current planning is either to incorporate these plantings alongside the emergency access road to be constructed under the KCRC Spur line project or to plant the same amount of trees at the area west of the existing bridge as shown in Figure 2.6. The total number of trees felled for the construction of the temporary drainage diversion would be provided in the same location when the land for the temporary drainage channel is reinstated to its original form.

Historical and Cultural Impacts

No mitigation is required as no impact is identified.

Land Contamination

No mitigation is required as no impact is identified.

As discussed in the above sections, this Project has placed great emphasis in minimising and, where possible, avoiding impacts on the environment. The high priority placed on environment protection is apparent in, amongst others, the proposed alignment, in that it is expected the chosen alignment will cause minimum environmental impact. Furthermore, good site practices and other mitigation measures have been proposed to further reduce the impacts associated with the construction and operation of the proposed alignment. A summary of these measures and the corresponding beneficial effects are presented in Table 1.

Table 1 – Summary of the Assessment Results

Environmental Issues		Location	Mitigation Measures / Beneficial Effects
Air Quality	Construction Dust	Within the site limits	Dust Suppression measure as set out in the *Air Pollution Control (Construction Dust) Regulations*
	During Operation	Within the criteria and hence no mitigation measures is required	
Noise	Construction Noise	Within works area	Noise control measures adopted by the use of quiet construction equipment and reducing the number of PME operating concurrently & the use of temporary movable noise barriers
	Road Traffic Noise	Within the design criteria hence no mitigation measures required in general	
		Along bridges	Concrete parapet on sides of bridges and approach ramps
Water Quality	During Construction	Within the site limits	Control on discharge from works site, with proper site management procedures
Hydrology	During Construction	Shenzhen River	Construction of bridge foundation in Shenzhen River will be carried out during the dry season thus minimise hydrological impacts on the River
Waste	Construction Waste	Within the site limits	Proper waste management procedures
Landscape and Visual	Visual Impacts	Within the site limits	Landscaping works and tree planting. Trees felled will be either compensated or replanted upon completion of works.
Ecology	Habitat loss and disturbance to Habitats		Chosen alignment avoids disturbance and minimise impact on ecology of the surrounding area

b. Potential Severity, Distribution and Duration of Key Environmental Impacts

With the implementation of the recommended mitigation measures, no adverse environmental impacts, both during construction and operation, are expected from the proposed project.

F. ENVIRONMENTAL MONITORING AND AUDITS

It is envisaged that an EM&A programme and manual will be developed at a later stage, which shall be incorporated into the contract specification. It is anticipated that the contractor for design and construction of the Project will be required to implement the EM&A manual based on the established requirements, and employs an independent environment team for auditing and regular reporting to the project proponent and EPD.

G. USE OF PREVIOUSLY APPROVED EIA REPORTS

There had been EIA undertaken for other projects in the same area. The following is a list of the more relevant projects:

1. Expansion of Kiosks and Other Facilities at Lok Ma Chau Boundary Crossing – ASD, February 1999;
2. Sheung Shui to Lok Ma Chau Spurline – KCRC, March 2002;
3. San Tin Eastern Main Drainage Channel – TDD/DSD, September 2002; and
4. EIA Study on Shenzhen River Regulation Project – Shenzhen River Regulation Office of the Shenzhen Municipal Government & DSD of HKSAR, 1995.