中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGRG. (HONG KONG) LTD.

KCRC Kowloon Southern Link

KDB300 Tunnels – Jordan Road to Yau Ma Tei Ventilation Building
KDB400 Tunnels – Yau Ma Tei Ventilation Building to Nam Cheong Overrun

ENVIRONMENTAL MANAGEMENT PLAN

Submission Reference	Date
KDB300/CSF/ENV/150002/D	26th April 2007
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1. INTRODUCTION

1.1. Background

To improve the accessibility between Tsim Sha Tsui (TST) East and West Kowloon districts, the Kowloon-Canton Railway Corporation (KCRC) has proposed to construct and operate a 3.8km (approx.) new underground railway line (thereinafter called "Kowloon Southern Link" or KSL) that will connect the new KCRC East TST Station to the current West Rail (WR) Nam Cheong (NAC) Station, with its alignment running under Salisbury Road, Canton Road and the West Kowloon Reclamation area. For the construction of KSL, KCRC has contracted out three civil construction contracts of design-build nature, namely KDB200, KDB300 and KDB400 and China State Construction Engineering (Hong Kong) Limited (CSCE) was awarded with the KDB300 & KDB400 (the Contracts) which commenced on 1st August 2005.

The Kowloon Southern Link (KSL) project is a Category 'A' Designated Project under Schedule 2 and Part 1 of the Environmental Impact Assessment Ordinance (EIAO). Pursuant to the EIAO, the Environmental Permit No. EP-215/2005 in regard of the construction and operation of the KSL project has been granted in May 2005 to the KCRC who was the primary permit holder. The KCRC later applied for and the Director of Environmental Protection issued a variation of the Environmental Permit No. EP-215/2005/A (the 'EP') on 9th August 2005. Upon awarded of the construction contracts, CSCE applied for the further EPs thus assuming the responsibility of the permit holder. Further EPs No. FEP-02/215/2005/A and FEP-03/215/2005/A were issued on 29th September 2005 for the Contract KDB300 and KDB400 respectively.

This Environmental Management Plan (EMP) that has been prepared in pursuing the Condition 2.4 of both the FEP-02/215/2005/A and FEP-03/215/2005/A aims to demonstrate and ensure effective implementation of the mitigation measures monitoring and remedial requirements presented in the EIA report & EM&A Manual as associated with the EP.

1.2. Scope of Works

KDB300 & KDB400 contracts scope of the construction work for the railway tunnel sections and associated civil works shall include, but not limited to, the following major items:

KDB300

- 850m of twin track cut-and-cover tunnel from the north end of proposed West Kowloon Station to the proposed Yau Ma Tei Ventilation Building with a pocket siding between the two running tracks at chainage U5+660 to U5+710;
- a short section of mined tunnel beneath the existing access subway at the MTRC Tai Kok Tsui Ventilation Building;
- building service works of earthing, drainage system, cable containment at trackside for cables of all systems and cable containment for all power supply and earthing cables within the tunnel;

- Other civil engineering works, e.g. temporary/ permanent utilities diversion, temporary traffic diversion, etc.

KDB400

- 1,050m of twin track cut-and-cover tunnel from the proposed Yau Ma Tei Ventilation Building to the existing Nam Cheong Overrun Tunnel;
- a section of mined tunnel beneath Cherry Street Culverts and Underpass;
- Yau Ma Tei Ventilation Building on piles;
- a toilet block together with Nam Cheong Park reprovisioning works;
- building services for the tunnels and all ancillary structures, ABWF, temporary and permanent diversion of utilities, drains and sewers; and,
- temporary traffic diversions.

The site layout plans for KDB300 and KDB400 are shown on Drawing No. KDB300/HA/Y0001A and KDB400/HA/Y0001A respectively.

1.3. Works Programme

The two contracts, both commenced on 1st August 2005 and to be completed in 2008/2009, have a total Contracts period of approximately 40 months. The construction programmes for the KDB300 and KDB400 are attached in Appendix A. The dewatering of groundwater would be carried out upon satisfactory pumping tests along the tunnel alignment that would commence tentatively in May 2006, subject to the final tunnel construction design and the updated ambient groundwater quality data. Pursuant to the condition 1.11 of FEP-02/215/2005/A and FEP-03/215/2005/A, the notified commencement date of construction was on 28th November 2005.

1.4. Objectives of the Environmental Management Plan

This EMP was designed to provide a detailed methodology for the proper management of the environmental impact generated from the Contracts, to manage and control the potential environmental impacts to levels in compliance with Section G8.1 of the General Specifications and relevant recommendations / conditions in the KSL EIA report & the EP.

The main objectives of the EMP are to:

- Ensure compliance with applicable statutory and contractual requirements and obligations;
- Designate respective responsibilities of various parties involved in the undertaking of site environmental works;
- Address all potential impacts outlined in the EIA Reports;
- Set out CSCE's environmental management approach;
- Initiate and implement mitigation measures;

- Set out general housekeeping practices; and
- Set out necessary emergency procedures.

1.5. Environmental Targets

CSCE has established environmental objectives and targets for the Contracts. Such objectives and targets have been established taking into account of the specifications and expectations of the Employer, legal requirements and all the environmental aspects of the Contracts. The main objectives and targets are:

- full compliance with relevant environmental laws and contractual requirements as a minimum;
- no complaints from occupants adjacent to the construction site;
- no prosecutions from the Environmental Protection Department;
- provision of adequate and appropriate training to all management staff, supervisory staff, sub-contractors and workers on the site;
- address all potential impacts outlined in the EIA report that relevant to the Contracts;
- provision of appropriate and effective mitigation measures to control potential environmental impacts;
- implementation of environmentally friendly operational practices that are to be followed by all management staff, supervisory staff, sub-contractors and workers on site; and,
- energy saving, water conservation and general housekeeping for environmental measures.

2. GENERAL ENVIRONMENTAL MANAGEMENT APPROACH

2.1. Environmental Policy Statement

CSCE operates an environmental policy, which is signed by the President declaring our commitment to prevent environmental pollution, reduce construction wastes and minimize the consumption of natural resources and continuously improve the environmental management system and performance. A copy of the environmental policy statement is given in Appendix B.

2.2. Promotion of Environmental Awareness

CSCE commits in promoting environmental awareness amongst its own site staff, its sub-contractors and the surrounding community. Every positive promotional step will be taken to ensure compliance with all environmental requirements (both legal and contractual) and minimizing environmental impacts by completing the following tasks:

- Proper training of all site staffs including subcontractor in regard of the implementation of environmental mitigation measures/ precautions;
- Effective two-way communication of environmental information amongst all stakeholder;
- Implementing a fair incentive and penalty system corresponding to the subcontractor's environmental performance; and
- Maintaining a good public relationship.

Training Courses

The HR Department and Corporate safety and Environmental Department of CSCE Head Office will identify the training need of all site key staffs whose works may associate with environmental issues. In terms of site operation, the site environmental management will offer the site staff and the subcontractors of site specific environmental training. The training topics will cover the followings:

- The roles and responsibilities in conforming with the company's environmental policy;
- The requirement and implementation of the company's environmental management system;
- The relevant EP requirements and the general statutory requirements;
- The contract specific environmental performance requirements; and
- The mitigation measures to be implemented for the Contracts.

Training sessions will be primarily inductions and toolbox talks/ seminars. Every site staff will receive before his/ her working on-site for the contract an induction course that briefs the general legislative requirement and site environmental mitigation measures. Toolbox talks/ seminars that will focus on the specific issues (e.g. EP requirement in regard of particular construction method, chemical waste spillage handling procedure, etc.) would be organised on a monthly basis or where necessary on an *ad-hoc* basis.

Communication of Information

CSCE site environmental management will top up the promotional need for environmental awareness over the contract site. Specifically, the site environmental management will ensure that all site staff and subcontractors' workers would be aware of the detailed requirements of relevant statutory legislation, conditions of various environmental permits (e.g. the EIAO permit, construction noise permits, effluent discharge licenses, etc.) and the Contract environmental requirements. The dissemination of environmental information on-site will be worked via:

- Notice boards at site offices, subcontractor's workshops and site common areas,
- Routine environmental progress meetings with subcontractors and site environmental management team,
- Workers' induction courses,
- Tool box talks, and
- Site memorandums.

Key site staff and the staff of subcontractors at the level of appropriate supervision level will be provided and briefed where appropriate with copies of relevant environmental documents, which shall include but not be limited to the following:

- Environmental Policy;

- Method Statements with environmental mitigation measures;
- Prevailing Environmental Permit & its variations and Further Environmental Permits
- Environmental Management Plan;
- Waste Management Plan;
- Environmental Monitoring and Audit Manual;
- Detailed landscape drawing(s)/ design drawing(s); and
- Groundwater management working plan

Incentive and Penalty Scheme

To encourage the good environmental behaviours of site operatives, CSCE will organise various competitions/ campaigns to recognise those best performers in regard of environmental protection. Categories of awards shall include; "Best Subcontractor of Environmental Performance", "Best Worker of Environmental Performance", etc.

On the contrary, CSCE will set up a penalty system for those subcontractors/ workers who do not perform or perform unsatisfactorily on the implementation of environmental mitigation measures.

Community Liaison Office

CSCE is fully aware that the public community (particularly the Man King Building, Yau Ma Tei Catholic Primary School, HKMA David Li Kwok Po College, Charming Garden, Park Avenue and Olympian City Two/ Three) in close proximity to the Contracts site would be the most sensitive receivers who may suffer from the possible nuisance and impacts arising from the site activities during the construction phase. For this reason, KCRC will set up pursuant to the Condition 2.8 of the EP and CSCE will affiliate to a community liaison office on that will serve as a pivot to bridge a communication chain between the site and the surrounding community. The dissemination of environmental information and sharing of views would be achieved via the followings and other means considered as appropriate.

- Setting up designated hotline and mailbox to incept complaints, comments, suggestions and requests from the community;
- Actively visiting the sensitive receivers (i.e. building residents, building owners' corporations and school principals) to learn their concern thus predicting the potential nuisance; and
- Constantly consulting with the school representatives of the school examination schedule in order to avoid from clashing with the noisy construction activities.

2.3. Specific Procedures for Achieving the Environmental Performance Requirements

To ensure achieving the environmental performance requirements under this contract and relevant legislation, CSCE is committed to provide sufficient resources to implement the following environmental protection measures:

- All necessary mitigation measures in compliance with relevant applicable legislation;
- All measures as stipulated in the EP relevant to the Project;

- All pertinent measures as detailed in the EIA Report, EM&A Manual & other related documents under the EP; and
- All measures as stipulated in the General Specification (GS) and Particular Specification (PS).

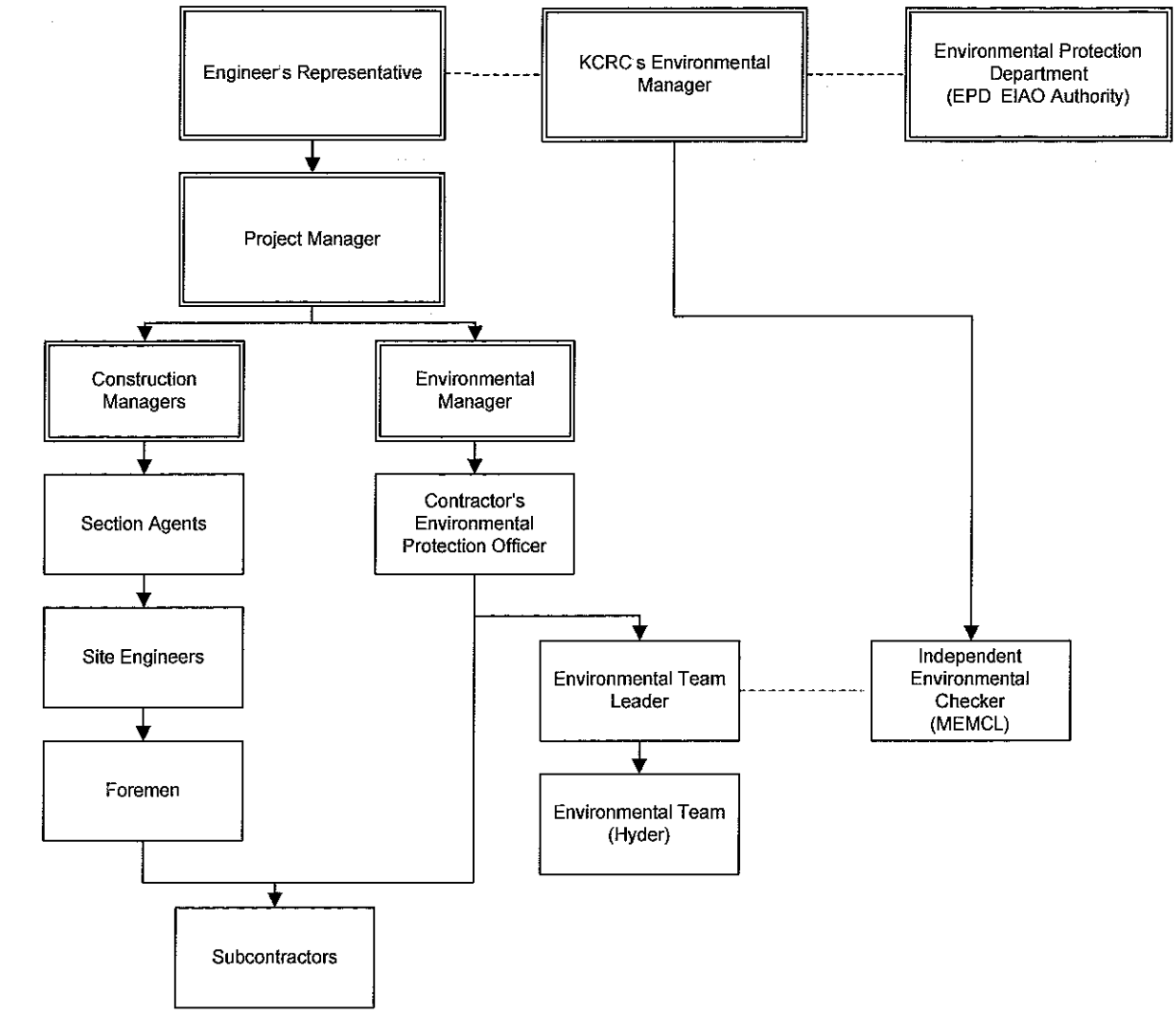
The mitigation measures as recommended in the above will cover the anticipated environmental aspects, viz. air pollution, water pollution, noise, waste management, landscape & visual impacts and will be detailed in the subsequent sections. CSCE will take specific procedures to ensure the said measures be implemented effectively on site. They are:

- Every worker including those from the subcontractor will attend an site induction session in which the site specific safety and environmental requirements will be briefed;
- To ensure that the environmental impacts and corresponding mitigation measures have been thoroughly taken into account in the planning stage, each method statement for the construction procedure will include a chapter of environmental review and such details would be briefed to the site engineer / foreman in-charge upon approval of the Engineer's Representative and before commencement;
- The site environmental performance on-site will be internally reviewed on a regular basis during the weekly internal coordination meetings which will be attended by the site management and frontline operatives.

3. ORGANISATION, ROLE AND RESPONSIBILITIES

3.1. Project Organisation

CSCE will establish and delegate an effective organisational structure to manage the environmental matters for the Contract. The manpower resource that includes relevant managers, teams, checker, sub-contractors, workers and persons at different levels and line of communication of the organisation are presented in the following chart.



3.2. Roles and Responsibilities of Key Personnel

CSCE shall have the overall responsibility for the undertaking of construction works and the implementation of this EMP. Site environmental management team of CSCE will carry out the required environmental management program for the Project. Identities of key parties/ persons undertaking the site environmental management are given in Appendix C. Descriptions of responsibilities of relevant parties are presented below:

Engineer's Representative (ER)

As the representative of KCRC, the ER will monitor CSCE's environmental compliance with the contract specifications. They will inspect and approve the environmental management measures and will instruct CSCE to follow the agreed protocols in the event of environmental related incidents and complaints

KCRC's Environmental Manager

KCRC's Environmental Manager will be responsible for liaising among the project stakeholders, including the Environmental Protection Department as the Authority, the IEC and the KDB200, 300 & 400 Contractors via the ER. With aid of the residential engineers from ER, he will oversee the implementation of mitigation measures per the EP and EIA recommendation, and ensure the KSL project to be proceeded in full compliance with the EIAO and relevant statutory requirements.

Project Manager (PM)

The Project Manager will be responsible for the overall site environmental management of the Project. He will oversee the implementation of the environmental management program on site. He will also ensure that the adequate resources will be provided and that the construction team will execute the works in compliance with all the requirements of the Contract Specifications, Environmental Permits and other statutory provisions.

Construction Managers (CM)

The Construction Manager is responsible for the day-to-day overview of the site construction practices in relation to environmental control and implementation of mitigation measures. They will assign designated personnel to assist in the day-to-day supervision and the implementation of the required mitigation measures. He will co-ordinate with the EnvM on all aspects concerning environmental issues and will report to the PM as necessary. He will be responsible for briefing the Section Agents, General Foremen and other site staff on environmental matters.

Environmental Manager (EnvM)

The Environmental Manager will have the key responsibility for the management of environmental issues associated with the Project. He will oversee the daily implementation of the environmental management program and co-ordinate with the site environmental management team on environmental compliance. He will report directly to Project Manager on the progress of environmental works including implementation of mitigation measures and corrective actions.

The EnvM will also be responsible for maintaining environmental records required for the Project. He will manage environmental emergency and co-ordinate the implementation of preventive and corrective measures in case of environmental non-compliance and receipt of environmental complaints throughout the construction period.

Contractor's Environmental Protection Officer (Contractor's EPO)

The Contractor's EPO will be assigned as a coordinator for the environmental management to support the work of the EnvM. The Contractor's EPO will be responsible for monitoring the EMP implementation, carrying out site surveillance, keeping environmental related documents as well as providing environmental training to staff at different levels. The Contractor's EPO will work closely with the Site

Engineers (SEngr) to ensure the project is carried out in compliance with all environmental related contractual and legal requirements.

Section Agents (SA)

The SA will work closely with the CM to assist in the management of the environmental issues arising from the construction activities. He will ensure that the measures set out in this EMP are implemented on site efficiently and effectively.

Site Engineers (SEngr)

The SEngr will assist the SA and CM in carrying out the day-to-day management of the construction works and EMP implementation. The SEngr will work closely with the Contractor's EPO to provide information from the site including the performance of the sub-contractors and the occurrence of non-compliance, etc.

Foremen

The foremen will assist the SEngr to implement the EMP and monitor the daily construction activities including those of subcontractors to meet the requirements of environmental and mitigation measures. In addition, the foremen will be responsible to maintain the on site environmental protection facilities and carry our remedial actions or measures to rectify the non compliance.

Project Sub-Contractors

The sub-contractors are required to observe and implement the measures set out by this EMP and follow all environmental related instructions given by the management staff of CSCE. They will also be responsible for reporting any non-compliance and conduct the rectifying actions as required in a timely and efficient manner by the SEngr.

Independent Environmental Checker (IEC)

The IEC who shall be appointed by KCRC will audit and verify the overall environmental performance of KSL project. His major responsibilities include the following:

- review and comment on the Contractor's environmental submissions as per the Environmental Permit;
- arrange and conduct monthly site inspections at the different works area along KSL alignment;
- review the programme of work to anticipate any potential environmental impacts that may arise;
- check the mitigation measures that have been recommended in the EIA and this Manual, and ensure they are properly implemented in a timely manner, when necessary; and
- report the findings of site inspections and other environmental performance reviews to KCRC's Environmental Manager and EPD.
- verify the contemporaneous logbook presented by the ET Leader.

Environmental Team Leader (ETL)

The ETL will maintain overall control of the management and monitoring works carried out by the ET. His major responsibilities include the following:

- Conduct site inspection and audit to identify any non-conformance and/or potential environmental impacts and recommend proper corrective and preventive actions;
- Carry out the required environmental monitoring and audit (EM&A) programs in accordance with the contract requirements;
- Conduct equipment calibration and maintenance according to the requirements stipulated in the EM&A Manual;
- Analyse and submit the required EM&A results to the Engineer's Representative;
- Keep a contemporaneous logbook of each and every instance or change of circumstances, which may affect the compliance with the recommendations of the EIA report and the EP;
- Propose preventive and corrective actions in case of exceedance, non-compliance and environmental complaint;
- Compile monthly EM&A reports in accordance with the contractual requirements and submit to the ER; and
- Certify documents/ proposals to be submitted as required under the EP and in pursuant to EIAO.

Environmental Team (ET)

An ET will be employed by the Contractor and will be responsible for carrying out the EM&A works per the EP and associated documents, such as the EM&A Manual. To cater the particularly significant noise and contaminated sediments / soils issues during the course of construction work, a noise specialist and on-site geotechnical engineer respectively will be joined to the Environmental Team which is headed by the ETL. The responsibilities of the ET for environmental management are:

- To ensure the environmental problem arising from works are addressed and controlled in an environmentally acceptable manner in compliance with the relevant requirements and regulations;
- To monitor the environmental parameters as specified in this EMP and the EM&A Manual.

3.3. Communication Procedures

Effective two-way communication will be developed to encourage the dissemination of environmental information among different parties. The communication is mainly through the following between CSCE, ETL, site workers and sub-contractors:

- Submission of monthly EM&A Reports;
- Regular environmental meetings (including regular meetings with members of site environmental management team and representatives of sub-contractors);
- Regular site inspections;
- Regular site environmental audits; and
- *Ad-hoc* site meetings/inspections as necessary.

The major means of communications are summarized in Table 3-1.

Table 3-1 Means of Communications

Means	Frequency	Purpose/Action	Responsible Party
CSCE Site Inspection	Continually	Promote awareness of environmental procedures among workers and sub-contractors via continual communications	CSCE (EnvM, Section Agents, General Foreman, Foreman, Site Engineers)
ET Regular Site Inspection	Weekly	Face-to-face communications between ER, IEC, CSCE site staff and ETL during the weekly site inspection	CSCE and ETL
Site meeting	Monthly	Face-to-face communications between CSCE (site environmental management team) and representatives of sub-contractors, ETL will attend when required	CSCE, sub-contractors and ETL
Ad-hoc site meeting	When necessary	Face-to-face communications between ETL and CSCE when any emergency events occur.	CSCE, ETL
EM&A Report	Monthly	Written communication among ETL, CSCE, the ER, IEC and the EPD.	ETL, CSCE, IEC and ER
Site Audit	Monthly	Face-to-face communications between CSCE, ER, IEC and ETL during the site audit	ETL, CSCE, IEC and ER
Electronic Copies of EM&A Reports on EIAO Internet	Monthly	Enable the public inspection of the monthly EM&A Reports via the EIAO Internet Website and at the EIAO Register Office	ETL

4. ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This Section of the EMP presents the project-specific environmental mitigation measures and monitoring requirements that will be implemented on site as per the EP and the EIA recommendations. Additional measures are also considered for the Contractor proposed methods.

4.1. Air Quality

Statutory and Contractual Requirements

The main legislation to control air pollution is the *Air Pollution Control Ordinance* (APCO) and its subsidiary regulations, including:

- Air Pollution Control (Furnaces, Ovens and Chimneys) (Installation and Alteration) Regulation;
- Air Pollution Control (Dust and Grit Emission) Regulation;
- Air Pollution Control (Smoke) Regulation;
- Air Pollution Control (Fuel Restriction) Regulation;
- Air Pollution Control (Open Burning) Regulation;

- Air Pollution Control (Construction Dust) Regulation; and
- Air Pollution Control (Vehicle Design Standards) (Emission) Regulation

Under the APCO, a set of Air Quality Objectives (AQO) has been established. The parameter in the AQO pertinent to the Contract is shown in Table 4-1

Table 4-1: Hong Kong Air Quality Objectives

Pollutant	Concentration in μg/m³ [(a)] Averaging Time				
	1 hour [(b)]	8 hours [(c)]	24 hours [(c)]	3 months [(d)]	1 year [(d)]
SO_2	800		350		80
TSP	500 [(g)]		260		80
RSP [(e)]			180		55
NO_2	300		150		80
CO	30,000	10,000			
O_3 [(f)]	240				
Pb				1.5	

Note:
(a) Measured at 298K (25°C) and 101.325 kPa (one atmosphere).
(b) Not to be exceeded more than three times per year.
(c) Not to be exceeded more than once per year.
(d) Arithmetic means.
(e) Respirable suspended particulates means suspended particulates in air with a nominal aerodynamic diameter of 10 micrometers or smaller.
(f) Photochemical oxidants are determined by measurement of ozone only.
(g) Non-statutory limit.

In addition to the APCO, a non-statutory hourly average Total Suspended Particulate (TSP) concentration of 500 μg m^{-3} measured at 298K and 101.325 kPa is recommended by the EPD and is generally accepted in Hong Kong for the control of construction dust impact.

The EM&A Manual specifies environmental limits, termed Action and Limit (A/L) levels that provide a framework for the interpretation of monitoring results.

The Contracts KDB300 & KDB400 involve notifiable works under the Air Pollution Control (Construction Dust) Regulation. CSCE will notify EPD on the handover of site from the Employer prior to the work commencement. As anticipated during the construction work, there will be dust-generating activities such as stockpiling, loading and unloading, transfer of dusty materials, haulage of trucks and debris handling, CSCE will ensure complying with the environmental requirements of this Regulation whilst undertaking these works.

Awareness and Identification of Impacts

Key air quality impacts associated with the major works of the Contracts KDB300 & KDB400 are identified as:

- Dust generation from excavation and backfilling activities
- Dust entrained from the haul road traffic

- Exhausts from the site plants
- Dust generation from materials handling
- Wind blown dust from the exposed earth/ spoils and temporary areas for stockpiling of excavated materials awaiting backfilling
- Fugitive dust generation from demolition of existing toilet block at Nam Cheong Park

Mitigation Measures and Preventive Actions

Process specific mitigation measures as recommended in the EIA report will be implemented:

General Measures

CSCE will comply with all pertinent environmental requirements as stipulated in the Contract Specifications and all applicable legislation. The dust control measures prescribed in the *Air Pollution Control (Construction Dust) Regulation* will also be implemented. General mitigation and preventive measures are summarized as follows:

- Stockpiles of dusty material will not extend beyond site boundaries; where these boundaries are adjacent to areas accessible to the public, hoarding of at least 2.4m height shall be provided.
- Stockpiles of sand and aggregate greater than $20m^3$ will be enclosed on three sides with the wall extending above the pile and 2m beyond the front of the pile. In addition, water sprays will be used to dampen stored materials and when receiving raw material.
- Wheel washing facilities will be installed and utilised at all exit points used by vehicular traffic, to ensure that no mud, earth, debris or dust is deposited on public roads. The stretch of road between the wheel wash and the public road will be hard surfaced.
- Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place shall be sprayed with water or a dust suppression chemical.
- Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides.

Dust generation from excavation and backfilling activities

- Spot spraying of water would be exercised to suppress the dust generation during the excavation and backfilling operation.
- Some excavations would be done in an open-cut manner thereby the excavation side slope would be shotcreted, hydroseeded or covered with tarpaulin sheets to prevent the wind blown dust.
- Any clearance materials will be removed as soon as possible to avoid excessive stockpiling. Where unavoidable, dusty stockpiles shall be adequately wetted and covered with tarpaulin sheet to prevent dust release from wind entrainment.

Dust entrained from the haul road traffic

- All haul roads within the site would be paved with concrete, bituminous, hardcores or be compacted and sprayed with water regularly as to maintain the entire road surface wet.
- Motorised vehicles will be restricted to a maximum speed of 30km/hr and shall be confined to designated haul roads which will be surfaced with hardcore.
- All exposed surfaces will be adequately sprayed with water, sprayed with dust suppression agents, hydroseeded or covered with tarpaulin sheets.
- Any vehicle with an open load compartment used for transferring dusty materials off-site will have properly fitted side and tail boards. Dusty materials will not be loaded to a level higher than the side and tail boards, and will be covered by a suitable tarpaulin in good condition before leaving site. The tarpaulin will be properly secured and extended at least 300mm over the edges of the site and tail boards and be properly secured and maintained throughout the journey to the off-loading destination.

Exhausts from the site plants

- Source control measures, such as proper maintenance of efficient exhaust smoke washers (scrubbers) for all internal combustion engines will be implemented in the tunnel.
- Exhaust nozzles of the site plant shall be as far as possible directed away from the sensitive receiver in vicinity.
- All finished portions of the tunnel shall be power ventilated, whenever necessary to carry away any accumulation of carbon monoxide and other exhausts from internal combustion engines of the plants working inside.

Dust generation from materials handling

- All dusty materials will be sprayed with water or a dust suppression agent immediately prior to handling of dusty materials

Wind blown dust from the exposed earth/ spoils and temporary areas for stockpiling of excavated materials awaiting backfilling

- Forward planning of work sequences and programme will be necessary to avoid too many exposed areas.
- The exposed spoil shall be properly watered at least twice a day throughout the construction phase
- Any excavated or stockpile of dusty material shall be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading.
- Exposed earth shall be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabiliser within 6 months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.

Fugitive dust generation from the demolition work

- Water spraying shall be provided on the spot of concrete breaking to suppress the dust generation.
- The demolition waste/ debris on sorting shall be watered to check the potential dust generation,

4.2. Water Quality

Statutory and Contractual Requirements

The main legislation to control water pollution is the *Water Pollution Control Ordinance* (WPCO). The Technical Memorandum (TM) under the WPCO on "Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters" defines the discharge limits of effluents under various circumstances.

Awareness and Identification of Impacts

During the construction phase, major source of site effluent will include:

- Groundwater from dewatering during the open cut excavation below water table;
- Surface runoff during and after heavy rainfall; and
- Effluent from wheel washing facilities; and
- Toilet and canteen wastewater from site facilities.

Mitigation Measures and Preventive Actions

CSCE will apply for a wastewater discharge license under the Water Pollution Control Ordinance (WPCO) before any discharge of effluent to the storm water drains and will comply with the terms of this licence and discharge standards as stipulated in the *Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters*.

CSCE will generally adopt the practices described in the EPD Practice Note for Professional Persons ProPECC PN 1/94 "Construction Site Drainage".

Underground Water from Dewatering

- Before excavation, groundwater samples of which the sampling locations would be proposed in a separate sampling plan shall be collected for analysis along the railway alignment to update the extent of potential groundwater contamination and to work out the baseline groundwater quality for the selection of recharge well locations.
- Subject to the finding of the baseline groundwater quality monitoring, extent of water contamination shall be defined where the groundwater from dewatering the contaminated area shall be recharged back to the ground via the purpose-built recharge wells.

- During the re-charging of underground water, the water level at the monitoring and control wells should be monitored on a daily basis to ensure that there is no likelihood of locally risen groundwater level and transfer of pollutants beyond the site boundary and the water quality be monitored on a weekly basis to ensure that the pollution levels will not increase significantly.
- The schedule of dewatering/ recharge operation and the selection of recharge wells shall be proposed in form of a working plan for ER's review, ET leader's and the IEC's certification prior to submitting to EPD for approval. Only if the EPD approves the working plan, the recharge operation concerning with the contaminated groundwater would proceed.
- Free products encountered during excavation shall be skimmed off for chemical waste disposal or removed by an oil interceptor prior to recharge.
- A discharge license under WPCO shall be where necessary obtained from Regional Office of EPD prior to the groundwater recharge operation.
- Spent grouts shall be collected in a separate slurry collection system, reconditioned and reused wherever practicable. The disposal of spent grouts will only be permitted if it is treated to the standards specified in the WPCO discharge licence before discharge to storm drains, or is disposed of to landfill or marine disposal grounds.

Surface Run-off

Site-specific preventive actions and mitigation measures will be implemented by CSCE to manage surface runoff from construction sites. CSCE commits to implement the following general mitigation measures and preventive actions.

- Catchpits and perimeter channels will be constructed at practical locations in advance of site formation works and earthworks. Surface run-off from the construction sites will be directed into storm drains via adequately designed wastewater treatment facilities such as sand traps, silt traps and sediment basins. To further encourage sediment settlement by reducing flow velocity, check dams will be constructed of rock, gravel or sandbags and placed across the storm drains.
- Silt removal facilities, channels and manholes will be maintained and the deposited silt and grit will be removed regularly, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.
- Open stockpiles of materials on site will be avoided or where unavoidable covered with tarpaulin or similar fabric during rainstorms. Measures will be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.
- Manholes (including any newly constructed ones) will always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system.
- Where possible, works entailing soil excavation will be minimised during the rainy season (April to September).
- Final earthworks surfaces will be well compacted to prevent erosion, and hydroseeded whenever possible following completion.

- Trench drains will be installed on the excavation side slope to direct the runoff to the designated sump where the runoff water would be pumped for sedimentation where necessary before final discharging at the WPCO licensed discharge point.

Wheel Washing Water

All vehicles and plant will be cleaned before they leave the construction site to ensure that no earth, mud or debris is deposited by them on roads. A wheel washing bay will be provided at every site exit, if practicable, and wash-water will have sand and silt settled out or removed before being discharged into the storm drains. In any case, discharge of wheel wash water will be minimised and recycled where possible. The section of construction road between the wheel washing bay and the public road will be paved with backfill to reduce vehicle tracking of soil and to prevent surface run-off from entering public road drains.

Wastewater from Site Facilities

During construction works, chemical toilets will be provided for the use of site staff. These will be provided by a licensed contractor, who will be responsible for appropriate disposal of sewage and maintenance of the chemical toilet. There will be no direct discharge of foul effluent to sewer. Wastewater from canteens or kitchens will be either stored in underground tanks followed by collection by a licensed contractor or will be directed to the foul sewer in vicinity.

Storage and Handling of Oil, Other Petroleum Products and Chemicals

All fuel tanks and chemical storage areas shall be provided with locks and be sited on sealed areas. The storage areas shall be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled oil, fuel and chemicals from reaching the receiving waters. CSCE shall prepare guidelines and procedures for immediate clean-up actions following any spillages of oil, fuel or chemicals.

Drainage from oil filling points and any areas where fuels and lubricants are used will be connected to storm drains via a petrol interceptor.

4.3. Noise Control

Statutory and Contractual Requirements

The principal legislation to control noise is the Noise Control Ordinance (NCO). Pursuant to this Ordinance, The Ordinance and associated regulations regulate the use of Powered Mechanical Equipment (PME) during the restricted hours, i.e. 1900 to 0700 hours on normal weekdays and any time on general holidays including Sundays and the noisy work activities in designated areas. The applicable subsidiary regulations include:

- Noise Control (General) Regulation;

- Noise Control (Hand-held Percussive Breaker) Regulation; and
- Noise Control (Air Compressor) Regulation.

Generally, the site will be closed on general holidays including Sundays. At an exceptional circumstance that construction works should be required during these restricted hours, CSCE will apply for a Construction Noise Permit (CNP) prior to execution of construction works in restricted hours.

Under the regulations of the NCO, all hand-held percussive breakers and air compressors adopted for the Contract will hold relevant noise emission labels from the EPD.

The requirements for noise pollution control are as follows:

- The noise level measured at 1m from the most affected external façade of the nearby noise sensitive receiver from the construction works alone during any 30 minute period shall not exceed an equivalent sound level (Leq) of 75 dB(A).
- The noise level measured at 1m from the most affected external façade of any nearby schools from the construction works alone during any 30 minute period shall not exceed an equivalent sound level (Leq) of 70 dB(A), or 65 dB(A) during examination periods.

Awareness and Identification of Impacts

Appreciated that the area around the site is of most noise sensitive and categorised as the designated area in Noise Control (Construction Work Designated Areas) Notice made under section 8A(1) of the Noise Control Ordinance, any excessive noise from the construction work would result a significant nuisance to the surrounding noise sensitive receivers. As identified in the EIA report, the noise sensitive receivers of concern under the two contracts respectively are:

<u>KDB300</u>

- Charming Garden
- Man Cheong Estate, particular of Man King Building being at about 15m to the nearest site boundary
- Yau Ma Tei Catholic Primary School
- HKMA David Li Kwok Po College
- Future schools at junction of Hoi Wang Road and Hoi Ting Road

<u>KDB400</u>

- Charming Garden
- Olympic City Phase 2
- Olympic City Phase 3 (under construction)

The major sources of construction noise are from operational site plants and machineries. As for the cut off wall to retard the water seepage during dewatering for the excavation, CSCE proposes to use sheet piles, pipe piles and bored piles. The use of piling machine would be the major source of noise and CSCE will implement appropriate mitigation measure to reduce the impact to the surround noise sensitive impact.

Mitigation Measures and Preventive Actions

General Measures

CSCE will implement the following mitigation measures and preventive actions where applicable to minimise potential noise impact:

- The foremen and site supervisors will ensure that plants operating on site are well maintained and serviced regularly by sub-contractors during construction.
- Foremen and site supervisors will remind the site workers to shut down or throttle back machinery and plant to a minimum when they are in intermittent use between working periods.
- Plant known to emit noise strongly in one direction (e.g., ventilation fan) will, where possible, be oriented so that the noise is directed away from nearby Noise Sensitive Receivers (NSRs).
- Subject to such working constraints as power supply, safety and obstruction of proposed works, the foremen and site supervisors will site the mobile plant as far away from the nearby NSRs as practicable.
- Noisy activities will be planned and scheduled to be undertaken during appropriate time periods to minimise potential noise impacts at nearby NSRs. Noisy construction activities will be scheduled to take place at noise-tolerant time periods (e.g. lunch time) or at times when sensitive dwellings are more likely to remain unoccupied.
- Materials stockpiles and other massive structures (such as temporary site offices) will be effectively utilised, where possible, to screen noise from construction activities.
- Noisy plant or processes will be replaced by quieter alternatives where possible. For instance, silenced diesel and gasoline generators and power units, as well as silenced and super-silenced air compressors will be selected for use, also, dump trucks may be replaced by quieter lorries.
- Where available, CSCE will request subcontractors to use models of plant that are quieter than those specified in the EPD's Technical Memorandum on Noise from Construction Work other than Percussive Piling.
- Unless otherwise approved by the ER, only quiet drilling rigs with a sound power level not exceeding 110 dB(A) will be used for rock drilling. Conventional pneumatically-driven drilling rigs will not be used.

Noise from Piling Machines

- Pursuant to the Noise Control Ordinance, CSCE will apply from EPD for a construction noise permit (CNP) for the sheet and pipe piling work at the site.
- CSCE will strictly follow the condition of the CNP so granted to perform piling at the designated permitted hours of operation and in the piling zone.
- Push-in type piling machine of lower sound level will be used whenever possible at area in close proximity of Man Cheong Estate and the schools near Yau Ma Tei Ventilation Building

Specific Measures for the Noise Sensitive Receivers

- Purpose built temporary noise barriers of 2.4m high with no openings or gaps and having a superficial surface density of at least 14kg/m^2 shall be erected on the site boundaries between noisy construction activities and noise sensitive receivers (NSRs)
- Movable temporary noise barriers on a skid footing with cantilevered upper portion, of superficial density of no less than 14kg/m^2 and with 25mm thick internal sound absorptive lining shall be located and used at the work area in front of Man King Building and Olympian City III upon occupation to shelter concrete lorry mixer, concrete pump truck, lorry/dump truck, concrete pump truck and hydraulic breaker operations. Movable barriers or flexible acoustic mat (shroud) shall be used for Powered Mechanical Equipment (PME) including pipe pile, rigs and auger. Full enclosure shall be used to shelter static plant including air compressor, generator, grout pump.
- The construction work at the tunnel section (about 100m) to the north of West Kowloon Station and in adjacent to the Man King Building should be scheduled to proceed sequentially section by section of not longer than 50m.
- Upon site handover, the representatives of the affected schools will be approached and closely liaised. CSCE will proactively obtain the school examination schedules and plan the work sequence so as to avoid noisy construction activities during school examination period.

4.4. Waste Management

Statutory and Contractual Requirements

The main legislation to control waste-related issues is the Waste Disposal Ordinance (WDO) and associated Waste Disposal (Chemical Waste) (General) Regulation. Management of chemical waste is implemented through the control of waste storage, labelling of waste, transportation and disposal of chemical waste at the Chemical Waste Treatment Centre. CSCE will obtain registration as a Chemical Waste Producer with EPD.

Chemical wastes will be collected, stored and disposed of in accordance with the Regulation. Disposal of other construction waste will be undertaken by licensed contractors in accordance with applicable statutory requirements in the WDO.

In addition to WDO, CSCE will commit to other applicable legislation such as Public Health and Municipal Services Ordinance and carry out the appropriate waste management work accordingly.

The Land (Miscellaneous Provisions) Ordinance would also be applicable to the Contracts whereby the Ordinance provides for the control of illegal dumping of public fills.

As revealed in the EIA report and the approved sediment quality report, parts of the KDB300 & KDB400 alignments lie within the area where contaminated marine deposits were found. CSCE will strictly follow the procedure in ETWB TC No.24/2002 "Management of Dredged/ Excavated Sediment". There is a consensus between KCRC and KDB200 and KDB300 & 400 Contractors that one marine dumping permit under Dumping at Sea Ordinance (Cap 466) for the KSL project would be applied by the KDB200 Contractor.

CSCE will prepare a contract specific Waste Management Plan (WMP) in accordance with the relevant KCRC Contract Specification and Condition 2.7 of EP-215/2005/A. The WMP shall include those details with reference to the Works Bureau Technical Circular No. 15/2003, "Waste Management on Construction Sites". The key points of the WMP are summarised in this EMP.

Awareness and Identification of Impacts

The wastes arising from the Contract will include site clearance wastes, excavated soils and rock, broken concrete, marine deposits (uncontaminated and contaminated), spent bentonite slurries, construction and demolition (C&D) wastes, chemical waste and workforce refuse.

Mitigation Measures and Preventive Actions

CSCE will adopt a waste management hierarchy for this project. The waste management options will be categorized in terms of preference from an environmental viewpoint. The options considered to be preferable have the least impacts and are more sustainable in long term. The hierarchy is as follows:

- Avoidance and minimization, i.e. not generating waste through changing or improving practices and design;
- Reuse of materials, thus avoiding disposal generally with limited reprocessing;
- Recovery and recycling, in which substantial reprocessing may be required; and
- Treatment and disposal, according to relevant laws, regulations, guidelines and good practice as the last option

The hierarchy is used to evaluate and select waste management options. The aim is to reduce and minimize the amount of waste to be generated and hence reduce the waste handling and disposal costs. For example, by reducing or eliminating over-ordering of construction materials, waste is avoided, and costs are reduced both in terms of purchasing and in disposal of wastes.

Details of waste management and procedures, and criteria of environmental performance for waste management will be presented in the contract specific WMP.

As a summary, CSCE will adopt whenever possible the following good site practice and waste reduction measures during the course of construction work.

- Use waste haulier authorised or licensed to collect specific category of waste;
- Obtain the necessary registration and licences under the Waste Disposal Ordinance and the Waste Disposal (Chemical Waste) (General) Regulation from the Environmental Protection Department;
- Nomination of an approved person, such as a site manager, to be responsible for good site practice, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site;
- training of site personnel in proper waste management and chemical waste handling procedures;
- provision of sufficient waste disposal points and regular collection for disposal;
- appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers;
- separation of chemical wastes for special handling and appropriate treatment at a licensed facility;
- regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors;
- a recording system for the amount of wastes generated, recycled and disposed of (including the disposal sites);
- In order to monitor the disposal of C&D material and solid wastes at public filling facilities and landfills, and control fly-tipping, a trip-ticket system shall be implemented in accordance with the Contract Specifications and the requirements of WBTC 31/2004 “Trip Ticket System for Disposal of Construction and Demolition Material”.
- segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal;
- to encourage collection of aluminium cans, paper waste and plastic bottles by individual collectors, separate labelled bins shall be provided to segregate this wastes from other general refuse generated by the work force;
- any unused chemicals or those with remaining functional capacity shall be recycled;
- use of reusable non-timber formwork to reduce the amount of C&D material;
- proper storage and site practices to minimise the potential for damage or contamination of construction materials; and

- plan and stock construction materials carefully to minimise the amount of waste generated and avoid unnecessary generation of waste.

Table 4-2 summarises the waste generation source and the respective management procedures.

Table 4-2 Waste Generation Sources

Waste Group	Source of Waste	Waste Management Procedures
Excavated Soils/ rocks	● Excavation and backfilling at the tunnel alignment ● Mined tunneling	● Excavated soils to be temporarily stockpiled at designated area awaiting backfilling (Drawing KDB300-HD-Y0001C) ● Surplus to be disposed of at the outlet designated by Fill Management Committee of CEDD
Broken Concrete/ Asphalt	● Culvert diversion/ demolition ● Traffic diversion ● Ste demobilisation ● Demolition of the toilet block at Nam Cheong Park	● Reuse as subbase and paving material whenever possible ● Surplus to be disposed of at public fills
C&D wastes	● Site clearance ● Formwork demobilisation ● Housekeeping activities	● Sort for recyclable materials, such as plastic, metals and cardboards ● Reuse materials, likes timber for formwork erection ● Non-recyclable to be disposed of a designated landfill.
Marine Deposits (MD)	● Excavation at strata of marine deposit as identified in the approved sediment quality report	● Subject to the MFC's allocation and EPD's dumping permit conditions, dispose of uncontaminated MD at open sea disposal site and contaminated MD at designated contaminated mud pit respectively.
Bentonite slurries	● Site investigation works ● Installation of dewatering/ recharge/ monitoring wells ● Grouting for cutoff walls ● jet grouting for local ground treatment	● Recover for reuse
Chemical Wastes	● Spent lube oil from site plants ● spent lead-acid batteries ● possibly recovered free product from groundwater dewatering and oil interceptors.	● Register with EPD as chemical waste producer ● Request collection by a licensed chemical waste collector for proper disposal
General Refuse	● Site operations ● site offices of the resident staffs ● Housekeeping activities	● Liquid effluents from toilets/ kitchens to be tanked away by a licensed collector ● Solid garbage to be disposed of at a landfill

4.5. Potential Hazard Installations/ Facilities

In line with the EIA assumption as in S.13 of the EIA Report, there will be no overnight storage of explosive in the construction site.

4.6. Landscape & Visual Impact

Statutory and Contractual Requirements

The EP issued under the EIA Ordinance associates with the EIA report that identified the possible landscape & visual impact and proposed corresponding mitigation measures. CSCE will implement the respective mitigation measures upon assumption of the responsibility of the EP holder after the approval of the further EP application.

Awareness and Identification of Impacts

The EIA reports have identified the landscape and visual impact during the construction phase. The major impacts are:

- Roadside landscape areas in West Kowloon
- Visually obtrusive sheeting for the temporary stockpiles
- Glare from night lighting of site

Mitigation Measures and Preventive Actions

- Felling of trees shall be restricted and be agreed with the authority whenever necessary.
- Use subdued 'camouflage' colour tone for the cover sheeting of stockpiles
- Control night lighting and prevent glare to surrounding residential area by directing all security lighting downward into work site areas.
- Maintain clean and tidy hoardings at all times.
- Prepare and implement upon EPD's approval the detailed landscape drawing(s)/ design drawing(s) in conformance with the recommendations in the EIA Report, including:
  - A total of no more than 1,200 trees shall be affected (i.e. felled or transplanted), of which no more than 105 trees shall be of high amenity value;
  - A minimum of 80% of the affected trees of high amenity value shall be transplanted ;
  - The total number of compensatory trees shall not be less than 130% of the number of affected trees;
  - Landscape proposals with compensatory planting on the reinstatement and re-provision of the amenity areas and public open spaces affected by the Project;
  - Compensatory trees shall be at least heavy standard size, unless planting is on a slope, in which case, tree size will be the largest practical size. Semi-mature size trees shall be used where appropriate at sensitive and prominent locations such as the Salisbury Garden;
  - Details of architectural design, chromatic treatment and visual and landscape mitigation measures for all above ground structures, including Station Entrances, Vent Shafts, Plant Room, Emergency and Firemen's Accesses to show that they shall be sensitively designed in a manner that responds to the existing and planned urban context, which may

include soft landscape measures to minimise the potential adverse landscape and visual impacts;

- Temporary planting to be implemented along east side of West Kowloon Station (WKN) structure to provide partial screening and to create a pleasant pedestrian environment prior to any future property development on the sites;
- Tall shrubs and climbing plants to be planted against the face of the Canton Road Plant Building so as to soften building façade. Trees shall also be planted in locations around the Canton Road Plant Building where traffic sightlines permit;
- Covering the 150m concrete tunnel box at Nam Cheong Park with topsoil and provision of landscape elements; and
- Transplanting proposal and measures to protect the trees to be retained within the construction site of the Project.

5. ENVIRONMENTAL MONITORING AND AUDIT PROCEDURES

5.1. Air Quality

Air Quality Monitoring

Air Quality monitoring will be carried out by the ET in accordance with the EM&A Manual, at the locations specified.

Corrective Actions

Action and Limit (A/L) levels that provide an appropriate framework for the interpretation of monitoring results has been specified in the EM&A Manual and are listed in Table 5-1. The air quality monitoring data would be checked against the A/L levels and corresponding event and action plan (EAP) would be implemented where exceedance of A/L levels is noted.

A sequence of corrective actions will consist of notification of relevant parties, investigation of the exceedance, proposal of remedial measures, implementation of the remedial measure, confirmation of remedial measures effectiveness and record keeping. Detailed steps of actions have been given in the EAP (Table 5-2).

Table 5-1: Construction Dust Action and Limit Levels

Parameters	Action	Limit
24 hour TSP level in ug/m^3	• For baseline level ≤ 200 ug/m^3, Action Level = (baseline level plus 30% + Limit Level)/2 • For baseline level > 200 ug/m^3,	260 ug/m^3

	Action Level = Limit Level	
1 hour TSP level in ug/m^3	• For baseline level ≤ 384 ug/m^3, Action Level = (baseline level plus 30% + Limit Level)/2 • For baseline level > 384 ug/m^3, Action Level = Limit Level	500 ug/m^3

Table 5-2 Event / Action Plan for Construction Dust

EVENT	ACTION			
	Environmental Team	IEC	The ER	Contractor
ACTION LEVEL				
Exceedance for one sample	• Identify source • Inform IEC and the ER • Repeat measurement to confirm finding • Increase monitoring frequency to daily	• Check monitoring data submitted by ET • Check contractor's working methods	• Notify contractor	• Rectify any unacceptable practices • Amend working methods if appropriate
Exceedance for two or more consecutive samples	• Identify source • Inform IEC and the ER • Repeat measurements to confirm findings • Increase monitoring frequency to daily • Discuss with IEC and contractor the possible remedial actions • If exceedance continues, arrange meeting with IEC and the ER • If exceedence stops, cease additional monitoring	• Check monitoring data submitted by ET • Check contractor's working methods • Discuss with ET and contractor the possible remedial actions • Advise the ER on the effectiveness of proposed remedial measures • Supervise implementation of remedial measures	• Confirm receipt of notification in writing • Notify contractor • Ensure remedial actions are properly implemented	• Submit proposals for remedial actions to IEC within 3 working days of notification • Implement the agreed proposals • Amend proposal if appropriate
LIMIT LEVEL				
Exceedance for one sample	• Identify source • Inform the ER • Repeat measurement to confirm finding • Increase monitoring frequency to daily • Assess effectiveness of contractor's remedial actions and keep IEC, EPD and the ER informed of the results	• Check monitoring data submitted by ET • Check contractor's working methods • Discuss with ET and contractor the possible remedial actions • Advise the ER on the effectiveness of proposed remedial measures • Supervise implementation of remedial measures	• Confirm receipt of notification in writing • Notify contractor • Ensure remedial actions are properly implemented	• Take immediate action to avoid further exceedence • Submit proposals for remedial actions to IEC within 3 working days of notification • Implement the agreed proposals • Amend proposal if appropriate
Exceedance for two or more consecutive samples	• Notify IEC, the ER, and contractor and EPD of the causes of the exceedence and actions taken • Identify source • Repeat measurements to confirm findings • Increase monitoring frequency to daily • Carry out analysis of contractor's working procedures to determine possible mitigation measures • Arrange meeting with EPD and the ER to discuss the remedial actions to be taken • Assess effectiveness of contractor's remedial actions and keep EPD and the ER informed of the results • If exceedance stops, cease additional monitoring	• Discuss with ET, the ER and contractor the remedial measures required • Revise contractor's remedial measures whenever necessary to ensure their effectiveness and advise the ER accordingly • Supervise implementation of remedial measures	• Confirm receipt of notification in writing • Notify contractor • In consultation with IEC, agree with contractor on remedial measures to be implemented • Ensure remedial measures are properly implemented • If exceedence continues, consider what portion of the work is responsible and instruct the contractor to stop that portion of the works until the exceedance is abated • Ensure remedial actions are properly implemented	• Take immediated action to avoid further exceedance • Submit proposals for remedial actions to IEC within 3 working days of notification • Implement the agreed proposals • Resubmit proposals if problem is not controlled • If exceedance continues, cease relevant portion of the works until exceendance is abated

5.2. Noise

Noise Monitoring

Noise monitoring will be carried out by the ET in accordance with the EM&A Manual, at the locations specified.

Corrective Actions

Action and Limit (A/L) levels that provide an appropriate framework for the interpretation of monitoring results has been specified in the EM&A Manual and are listed in Table 5-3. The noise monitoring data would be checked against the A/L levels and corresponding event and action plan (EAP) would be implemented where exceedance of A/L levels is noted.

A sequence of corrective actions will consist of notification of relevant parties, investigation of the exceedance, proposal of remedial measures, implementation of the remedial measure, confirmation of remedial measures effectiveness and record keeping. Detailed steps of actions have been given in the EAP (Table 5-4).

Table 5-3: Construction Noise Action and Limit Levels

Time Period	Action	Limit
0700-1900 hrs on normal weekdays	When one documented complaint is received	75* dB(A)
0700-2300 hrs on holidays; and 1900-2300 hrs on all other days	When one documented complaint is received	70 dB(A)
2300-0700 hrs	When one documented complaint is received	55 dB(A)

(*) reduce to 70 dB(A) for schools and 65 dB(A) during school examination periods.

Table 5-4: Event / Action Plan for Construction Noise

Event	Action			
	ET Leader	IEC	The ER	Contractor
Action Level	• Notify IEC and the Contractor. • Carry out investigation. • Report the results of investigation to IEC and the Contractor. • Discuss with the Contractor and formulate remedial measures. • Increase monitoring frequency to check mitigation measures.	• Review with analysed results submitted by ET. • Review the proposed remedial measures by the Contractor and advise the ER accordingly. • Supervise the implement of remedial measures.	• Confirm receipt of notification of exceedance in writing. • Notify the Contractor. • Require the Contractor to propose remedial measures for the analysed noise problem. • Ensure remedial measures are properly implemented.	• Submit noise mitigation proposals to IEC. • Implement noise mitigation proposals.
Limit Level	• Identify the source. • Notify IEC, the ER, EPD and the Contractor. • Repeat measurement to confirm findings. • Increase monitoring frequency. • Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented. • Inform IEC, the ER, and EPD the causes & actions taken for the exceedances. • Assess effectiveness of the	• Discuss amongst the ER, the ET Leader and the Contractor on the potential remedial actions. • Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER, accordingly. • Supervise the implementation of remedial measures.	• Confirm receipt of notification of exceedance in writing. • Notify the Contractor. • Require the Contractor to propose remedial measures for the analysed noise problem. • Ensure remedial measures are properly implemented. • If exceedance continues, consider what activity of the work is responsible and instruct the Contractor to stop that activity of work until the exceedance is abated.	• Take immediate action to avoid further exceedance. • Submit proposals for remedial actions to IEC within 3 working days of notification. • Implement the agreed proposals. • Resubmit proposals if problem still not under control. • Stop the relevant activity of works as determined by the ER, until the exceedance is abated.

Event	Action			
	ET Leader	IEC	The ER	Contractor
	Contractor's remedial actions and keep IEC, EPD and the ER, informed of the results. • If exceedance stops, cease additional monitoring			

5.3. Water Quality

Water Quality Monitoring

The water quality of effluent generated on-site would be monitored in accordance with the requirements of licence issued under Water Pollution Control Ordinance. The locations of monitoring points, monitoring frequency and the parameters to be monitored will be determined in accordance with the licence conditions and are likely to include suspended solids and total petroleum hydrocarbons.

Should the baseline groundwater quality monitoring reveal the groundwater contamination, the groundwater dewatered from the contamination spot of interest shall be recharged back into the ground that the quality of recharged water and the local rise of water level of the recharge well shall be monitored to ensure the pollutant level of recharging groundwater of no higher than the baseline at the recharge well.

Corrective Actions

Discharge limits of water quality parameter have been specified in the *Water Pollution Control Ordinance* licence and will conform to the *Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters* (*TM-ES*). Should any of the effluent discharge standards be exceeded, the event and action plan as specified in the EM&A Manual would be implemented, of which the critical steps are summarised as below.

- Notify to relevant parties/ authorities
- Stop the effluent discharge
- Propose remedial action
- Implement the accepted remedial action
- Monitor the remedial action effectiveness

During the dewatering operation, groundwater quality & level would be monitored according the EM&A Manual. Should there be exceedance/ non-compliance observed, the action in the following Event and Action Plan would be taken.

Table 5-5: Event / Action Plan for Groundwater Recharging

Event	Action			
	ET Leader	IEC	ER	Contractor
Ground water level at recharge point exceeds 1m from baseline	1. Notify IEC and the Contractor. 2. Carry out investigation. 3. Report the results of investigation to IEC and the Contractor. 4. Discuss with the Contractor and formulate remedial measures. 5. Increase monitoring frequency to check mitigation measures.	1. Review with analysed results submitted by ET. 2. Review the proposed remedial measures by the Contractor and advise ER accordingly. 3. Supervise the implement of remedial measures.	1. Confirm receipt of notification of exceedance in writing. 2. Notify the Contractor. 3. Require the Contractor to propose remedial measures for the analysed groundwater problem. 4. Ensure remedial measures are properly implemented.	1. Reduce the recharge rate AND / OR 2. Suspend the recharge until the groundwater level at recharge points falls back to less than 1m difference with the baseline
Pollution level of recharging groundwater exceed the baseline level / the pollution levels at the monitoring well	1. Notify IEC and the Contractor. 2. Carry out investigation. 3. Report the results of investigation to IEC and the Contractor. 4. Discuss with the Contractor and formulate remedial measures. 5. Increase monitoring frequency to check mitigation measures.	1. Review with analysed results submitted by ET. 2. Review the proposed remedial measures by the Contractor and advise ER accordingly. 3. Supervise the implement of remedial measures.	1. Confirm receipt of notification of exceedance in writing. 2. Notify the Contractor. 3. Require the Contractor to propose remedial measures for the analysed groundwater problem. 4. Ensure remedial measures are properly implemented.	1. Suspended the recharge OR 2. Treatment of the recharging groundwater

5.4. General Site Housekeeping

In addition to examining environmental mitigation and management measures, Foremen and Site Supervisors will regularly inspect and check against the site cleanliness as well as general good housekeeping measures as follows:

- Common areas to which site staff have access such as lockers, toilets and mess rooms will be maintained in clean and sanitary conditions at all times;
- All sites are kept free from litter and rubbish. CSCE will provide waste skips and garbage bins with suitable covers at designated locations. Such locations will be included, but not limited to, office areas, workshop areas and works areas. All waste disposal points will be maintained and cleaned regularly;
- All passageways, staircases, corridors and means of escape routes will always be kept clear;
- Oily and greasy rags will be stored in metal bins and handled and disposed of as chemical waste;
- Pest control services will be implemented for site offices and workshops areas as well as mosquito control for stagnant water in the work site. CSCE will appoint specialist subcontractor to undertake the pest control measures on a quarterly basis. Frequency of the services will be increased when an occasion that a particular problems are identified;
- Tools will not be left unattended on the floor or any location that could potentially cause an accident;
- All lighting and ventilation facilities will be kept clean and unobstructed at all times;
- The floor of work places will be kept in a non-slippery condition;
- Any protruding nails retaining in wooden boards will either be removed or bent over; and
- Facilities and collecting points will be provided for the disposal of rubbish/waste. The general refuse handling procedures are documented in the stand-alone WMP.

CSCE will be vigilant in controlling the pest on site, particularly the mosquito breeding that may potentially transfer disease of Dengue Fever. Upon site handover, CSCE will devise a comprehensive and site specific mosquito / pest control programme. The basic steps of the site pest control management shall include:

- Deployment of competent staff in-charge
- Routine inspections for potential pest problem
- Implementation of control measures, e.g. regular application of pesticide, hire of specialist pest control service for hotspots
- Formulation of event action plans
- Good record keeping

5.5. Site Inspection

Site inspection will be undertaken on a weekly basis to ensure that appropriate environmental protection and pollution control measures are being properly implemented.

The ET leader and the supervisory staff will be responsible for carrying out the weekly site inspection. Ad-hoc site inspections will also be carried out by EnvM or Contractor's EPO if environmental problems are identified. The checklist as shown in Appendix D will be used during the site inspection.

Should there be any defects or deficiencies identified during the inspection, the ET leader will record and ask for the relevant supervisory staff to agree to take rectifying action and the time and date by when this will be completed. A summary of findings and agreed follow-up actions will be recorded in the inspection checklist, which will be signed off by the ET leader, EnvM/ Contractor's EPO and the ER. The EnvM or Contractor's EPO will initiate the rectification actions and report the status to the ER before the forthcoming weekly inspection. The progress of the rectifying action will then be verified in the forthcoming weekly inspection and recorded in the environmental inspection checklist . The respective event and action plan giving the role of all parties is proposed in Table 5-6.

Table 5-6: Event / Action Plan for Deficiencies Revealed in the Site Inspection

Event	Action			
	ET Leader	IEC	ER	Contractor
Defects or deficiencies revealed in the site inspection	1. Identify the cause of event 2. Discuss with the Contractor to formulate rectifying action within 24 hrs of the inspection 3. Report the event in the inspection checklist 4. Follow up the rectifying action in the forthcoming inspection	1. Review the proposed rectifying action by the Contractor and advise ER accordingly 2. Sign off the inspection checklist 3. Verify that the rectifying action has been satisfactorily taken	1. Review and agree the proposed rectifying action by the Contractor. 2. Agree with the Contractor the time frame for the rectifying action to be taken. 3. Sign off the inspection checklist 4. Verify that the rectifying action has been satisfactorily take.	1. Propose the rectifying action 2. Take the rectifying action within the agreed time frame 3. Report the rectification status to the ER

6. EVENT CONTINGENCY PLAN

In the case of any non-compliance identified and/or complaints received on environmental related issues including air, noise, wastewater, waste etc, the responsible personnel/parties will action in accordance with the Corrective Action plans detailed above.

6.1. Environmental Emergency Procedures for Chemical Spillage

For any environmental emergency involving the spillage or leakage of chemicals, CSCE will implement the following response procedures:

- Instruct untrained personnel to keep at a safe distance well away from the spillage area;
- If the spillage is in an enclosed area (e.g. inside the chemical storage area), open the doors and windows to enhance ventilation;
- If the spillage involves highly toxic, volatile or hazardous materials, initiate emergency evacuation (refer to the Construction Safety Plan) and call the emergency service;
- Only persons equipped with suitable protective clothing and equipment will be allowed to enter and clean up the chemical spillage area;
- Spillage of liquid at storage area - where the spillage is contained in the enclosed storage area, the liquid will be transferred into suitable chemical waste containers by suitable hand held equipment, such as hand operated pumps, scoops and shovel. If the spillage quantity is small, it will be covered and mixed with suitable absorbing materials such as tissue paper, dry soft sand or vermiculite. The resultant slurry will be treated as chemical waste and transferred to suitable containers for disposal;
- Spillage at other areas - For spillage in other areas, immediate action is required to contain the spillage. Suitable liquid absorbing materials such as tissue paper, dry soft sand or vermiculite will be used to cover the spill. The resultant slurry will be treated as chemical waste and transferred into containers for proper disposal; and

In incidents where the spillage may result in significant contamination of an area or risk of pollution, EPD will be informed immediately.

7. COMPLAINTS PROCEDURES

The complaints handle procedure will be following the complaint handling flow diagram and reporting channel, which are presented in Appendix E.

During the complaint investigation work, CSCE and ER will cooperate and provide all the necessary information and assistance for completion of the investigation. If mitigation measures are identified in the investigation, the CSCE will promptly carry out the mitigation works. The ER will ensure that the measures have been carried out by CSCE.

Specific to the KCRC's complaint system, the following actions would be taken in case of receiving a complaint.

- Complaints should be logged onto the complaint database;

- KCRC will be responsible for reporting to EPD the follow-up actions if complaints received by KCRC through EPD;
- Cases of the complaints would be only closed should the IEC satisfied with the explanations/ investigation findings.
- CSCE will fulfil necessary procedures in compliance with KCRC's complaint system.

8. TRAINING

Training will be given to all staff to promote the proactive management of environmental issues during the construction phase of the Contract. The EnvM will identify the training needs, establish a training programme and initiate appropriate training to relevant persons in order to ensure they are fully aware and understand the necessary environmental protection measures to be employed and the manner in which they are implemented. Such training is of two types, viz. induction sessions and toolbox talks that will be carried out before the site staff being on-duty on site and at a monthly basis respectively. The content of the training will include the following.

- The steps and requirements of the EMP stipulated in the Contract;
- Procedures and measures for environmental protection;
- Environmental Management Policy;
- Requirements of environmental legislation, permits and the contract; and,
- Specific Environmental Management System and guidelines for construction works;
- Environmental mitigation measures required;
- Pollution prevention;
- Use and maintenance of site environmental facilities; and,
- Handling procedures of environmental incidents and emergencies.

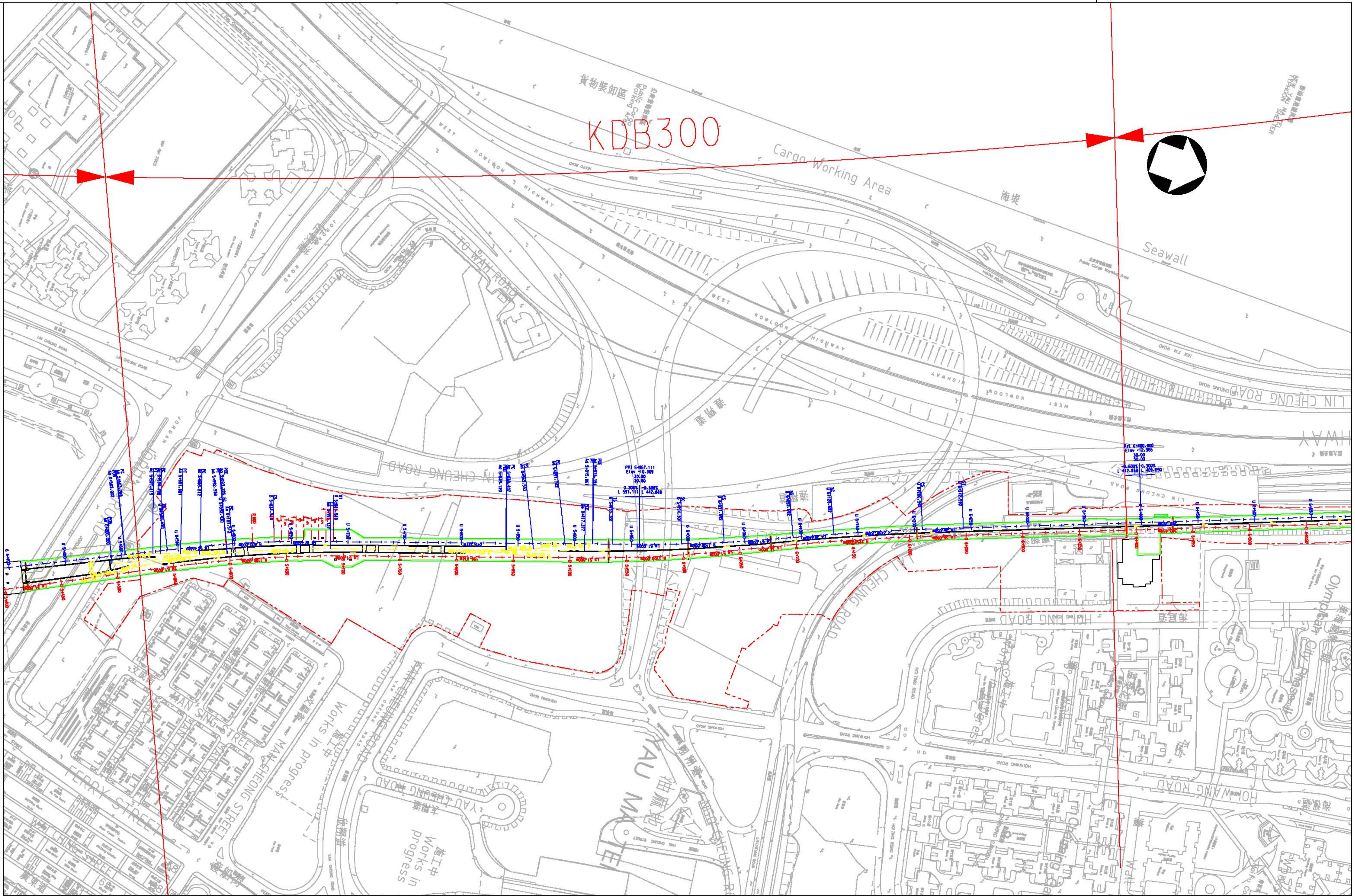
9. ENVIRONMENTAL RECORDS

In execution of this EMP, environmental records will be kept properly by responsible personnel. Table 9-1 lists out the detailed categories of environmental records required.

Table 9-1: Key Environmental Records

Category	Environmental Record	Location of Record	Responsible Personnel
General	● Site diary ● Site inspection records ● Construction programs	● KDB300 & KDB400 contract office at Canton Road Government Offices	● EnvM/ Contractor's EPO

Category	Environmental Record	Location of Record	Responsible Personnel
	● Environmental training records ● Equipment maintenance/repair records ● Copies of waste management plan (WMP), EMP, Environmental Monitoring and Audit (EM&A) manual, all EM&A Reports and applications submitted ● Correspondence with EPD, KCRC, ET, the ER, IEC and other parties in relation to environmental issues ● Minutes of meetings ● Non-compliance Notifications	● KDB300 & KDB400 contract office at Canton Road Government Offices	● EnvM/ Contractor's EPO
EIA matters	● Environmental Permit (EP)/ Variation of EP/ Further EPs issued by EPD ● Contemporaneous logbook	– ditto -	● EnvM/ Contractor's EPO ● ET Leader
Air Pollution Control	● Notification to EPD in accordance with the Air Pollution Control (Construction Dust) Regulation ● Impact monitoring	– ditto -	● EnvM/ Contractor's EPO
Noise Control	● Construction Noise Permits (CNP) issued by EPD ● Noise testing results for hand-held percussive breakers and air compressors ● Updated list of PME used on site	– ditto -	● EnvM/ Contractor's EPO
Water Pollution Control	● Discharge licence issued by EPD in accordance with the Water Pollution Control Ordinance ● Effluent monitoring records	– ditto -	● EnvM/ Contractor's EPO
Waste Management	● Chemical Waste Producer Registration Record ● Trip tickets for all waste collection and disposal ● Copies of relevant licenses of the waste haulers and waste collectors ● Records on quantities of all wastes generated on site and disposal ● Storage locations ● Records of recycling and reuse	– ditto -	● EnvM/ Contractor's EPO
Chemical / DG Storage	● Drawings of chemicals/DGs storage facilities ● Material Safety Data Sheets (MSDS) ● DG Licence	– ditto -	● Safety Manager/ Safety Officer
Complaints	● Complaint records, Notifications of Complaint, investigation reports, records of actions taken and/or mitigation measures implemented, correspondence with relevant parties	– ditto -	● EnvM/ Contractor's EPO
Environmental Emergency	● Emergency Incident Reports	– ditto -	● EnvM/ Contractor's EPO
Corrective and Preventive Actions	● Corrective and Preventive Action Requests (CPAR) Form ● Corrective and Preventive Actions Logbook	– ditto -	● EnvM/ Contractor's EPO



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$DATE$ $TIME$

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DESIGNED BY: BK
DRAWN BY: Wai
CHECKED BY: BK
IN CHARGE: MY
DATE: 30Aug2005

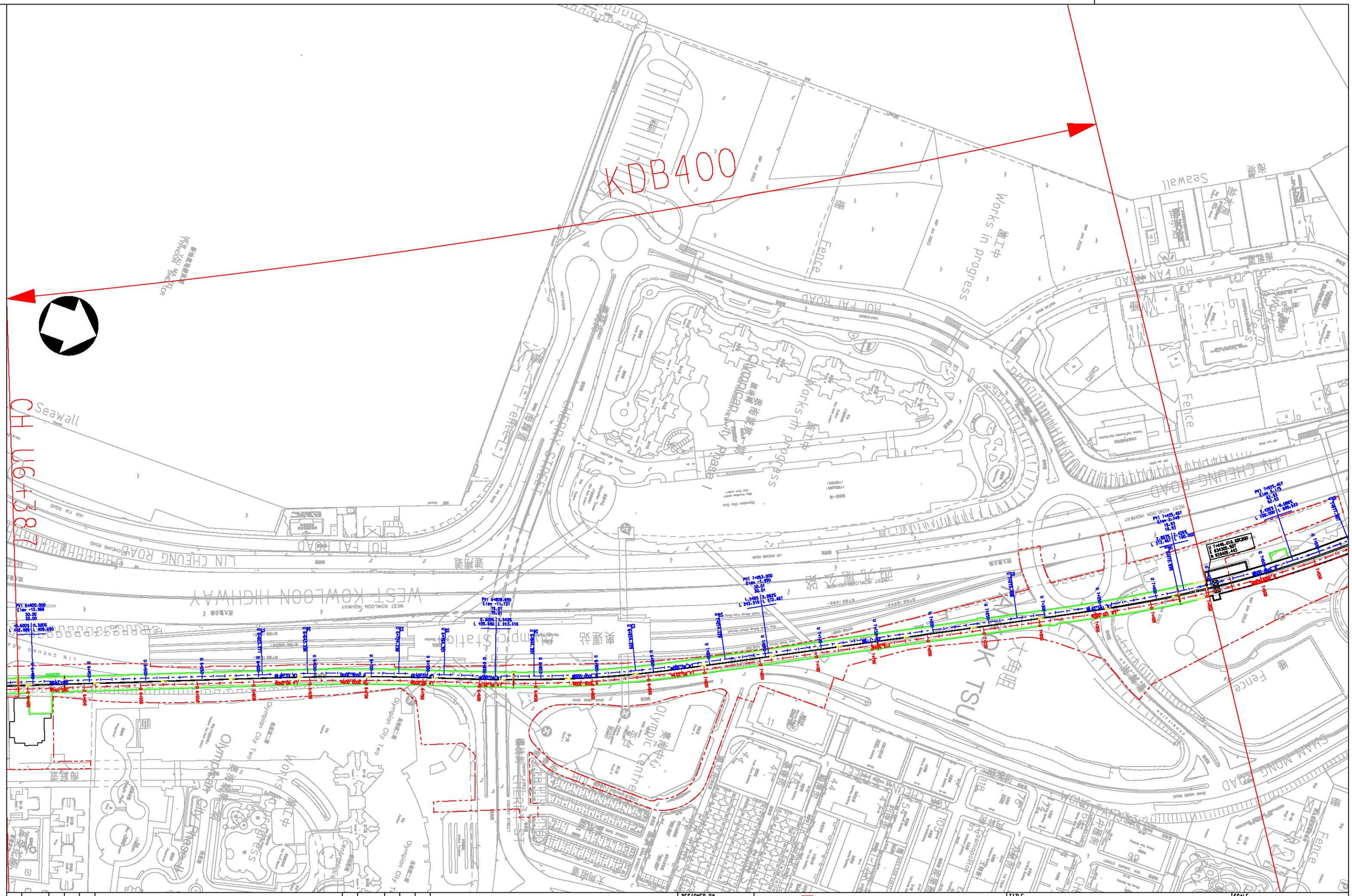
KCR 九廣鐵路
九龍南線 Kowloon Southern Link

中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGRG. (HONG KONG) LTD.

TITLE
KDB300 & 400 TUNNEL
JORDAN ROAD TO NAM CHEONG OVERRUN
Site Layout for
KDB 300

SCALE			
1 : 1500 @ A1			
ORIGINATOR	ORIGINATOR REFERENCE		
CSHK	KDB300-HA-Y0001A.dgn		
DRAWING NUMBER			REV
KDB300 /HA/Y0001			A
RAILWAY	LOCATION	STAGE	SHEET NO
KSL	---	D	1

FULL SIZE A1



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DESIGNED BY	BK
DRAWN BY	Wai
CHECKED BY	BK
IN CHARGE	MY
DATE	30Aug2005

KCR 九龍南線 Kowloon Southern Link

中國建築工程(香港)有限公司 CHINA STATE CONSTRUCTION ENGRG. (HONG KONG) LTD.

TITLE

KDB300 & 400 TUNNEL JORDAN ROAD TO NAM CHEONG OVERRUN

Site layout for KDB400

SCALE	1 : 1500 @ A1
ORIGINATOR	CSHK
ORIGINATOR REFERENCE	KDB400-HA-Y0001A.dgn
DRAWING NUMBER	KDB400 /HA/Y0001
REV	A
RAILWAY	KSL
LOCATION	---
STAGE	D
SHEET NO	1

FULL SIZE A1

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$DATE$ $TIME$

Legend:

- Proposed Sorting & Temporary Stockpiling Area
- (CW) Chemical Waste Storage
- Routes of waste Disposal

FOR NATURAL EXCAVATED MATERIALS AND MARINE DEPOSITS TO KDB200 BARGING POINT.

Barging point operated by KDB200 Contractor

FOR ARTIFICIAL MATERIALS, C & D WASTES AND OTHER WASTES TO TM38, TKO137, SENT & CWTC.

LOCAL SITE OFFICE

CH U6+387

CH U5+517

KDB400

KDB300

KDB200

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MODELNAME: 300 and 400

REV	DATE	BY	SUB	APP	DESCRIPTION

REV	DATE	BY	SUB	APP	DESCRIPTION

DESIGNED BY BK
DRAWN BY Woi
CHECKED BY BK
IN CHARGE MY
DATE 10OCT2005

KCR 九廣鐵路 Kowloon Southern Link

中國建築工程(香港)有限公司 CHINA STATE CONSTRUCTION ENGRG. (HONG KONG) LTD.

TITLE

KDB300 & 400 TUNNEL
JORDAN ROAD TO NAM CHEONG OVERRUN
Proposed Sorting
&
Temporary Stockpiling Area

SCALE	1 : 4000 @ A1		
ORIGINATOR CSHK	ORIGINATOR REFERENCE KDB300-HD-Y0001B.dgn		
DRAWING NUMBER KDB300 /HD/Y0001			REV C
RAILWAY	LOCATION	STAGE	SHEET NO
KSL	---	D	1

APPENDIX A

TENTATIVE WORKS PROGRAMME

Contract No. & Name	KDB300 Tunnels - Jordan road to Yau Ma Tei Vent. Bldg.

中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGRG. (HONG KONG) LTD.

Date : 1 October 2005

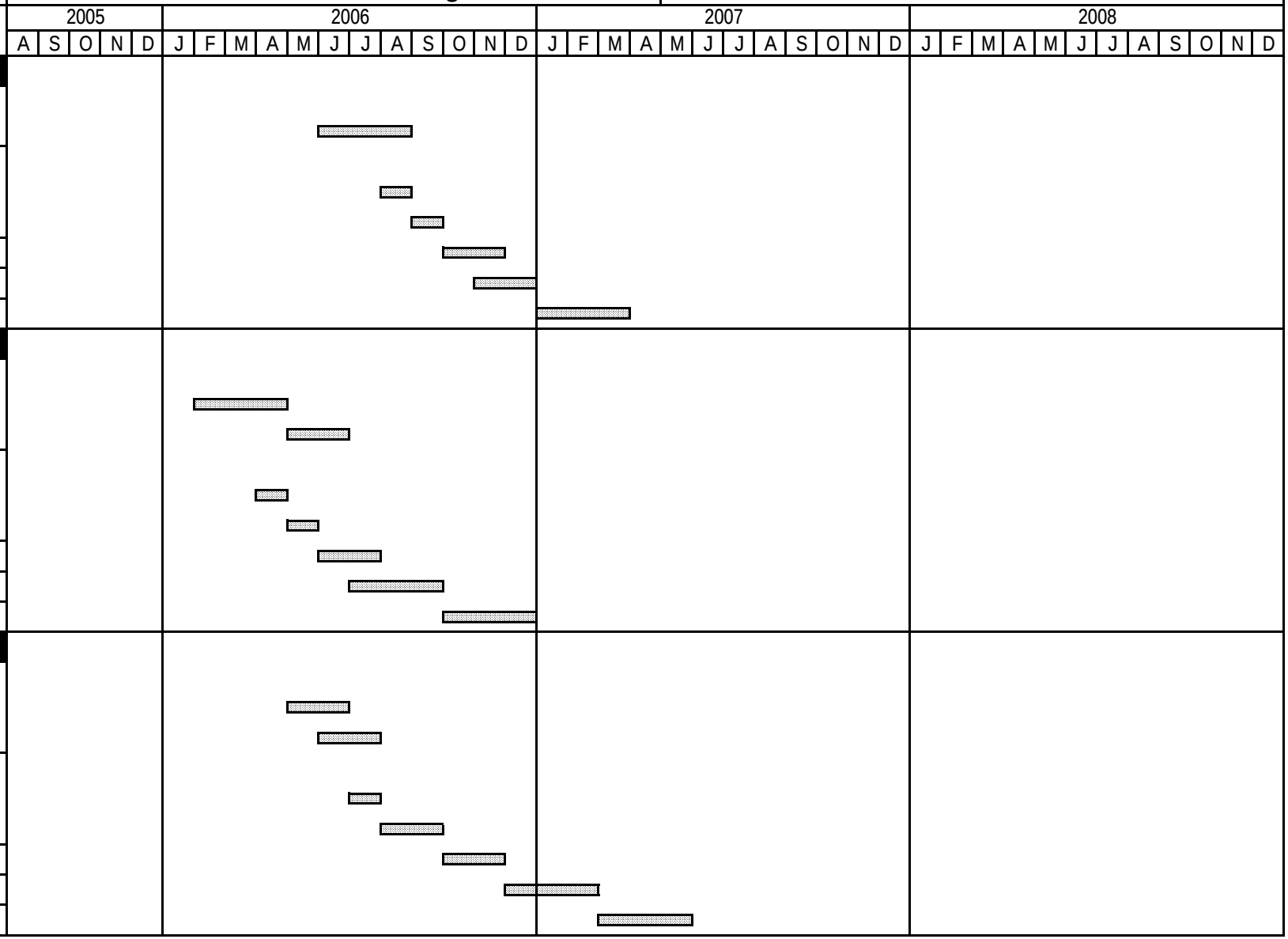
Major Construction Works	2005					2006										2007											2008										
	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Preliminaries																																								
Design Works																																							
Site Preparation Works																																							
Tunnel Chainage U5+515 to U5+619																																							
Temporary Works																																							
Sheet piling																																							
Steel decking																																							
Support to the culvert																																							
Dewatering System																																							
Recharge wells installation																																							
Pumping test																																							
Deep Excavation																																							
Tunnel Construction																																							
Backfilling																																							
Tunnel Chainage U5+619 to U5+741																																							
Temporary Works																																							
Sheet piling																																							
Dewatering System																																							
Recharge wells installation																																							
Pumping test																																							
Deep Excavation																																							
Tunnel Construction																																							
Backfilling																																							
Tunnel Chainage U5+741 to U5+805																																							
Temporary Works																																							
Sheet piling																																							
Support to the culvert																																							
Dewatering System																																							
Recharge wells installation																																							
Pumping test																																							
Deep Excavation																																							
Tunnel Construction																																							
Backfilling																																							

TENTATIVE WORKS PROGRAMME

Contract No. & Name	KDB300 Tunnels - Jordan road to Yau Ma Tei Vent. Bldg.

中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGRG. (HONG KONG) LTD.

Date : 1 October 2005

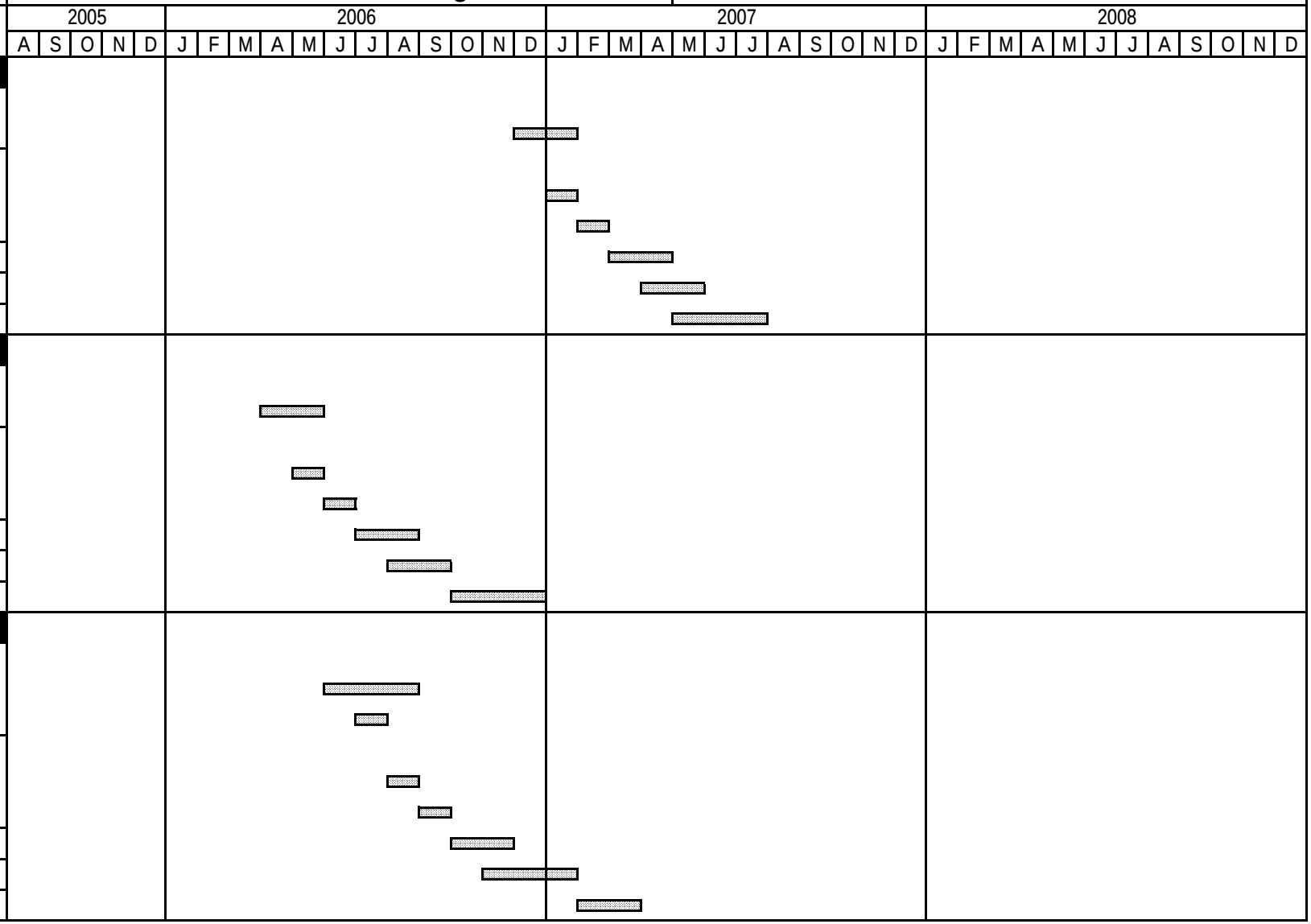


TENTATIVE WORKS PROGRAMME

Contract No. & Name	KDB300 Tunnels - Jordan road to Yau Ma Tei Vent. Bldg.

中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGRG. (HONG KONG) LTD.

Date : 1 October 2005



TENTATIVE WORKS PROGRAMME

Contract No. & Name	KDB300 Tunnels - Jordan road to Yau Ma Tei Vent. Bldg.

中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGRG. (HONG KONG) LTD.

Date : 1 October 2005

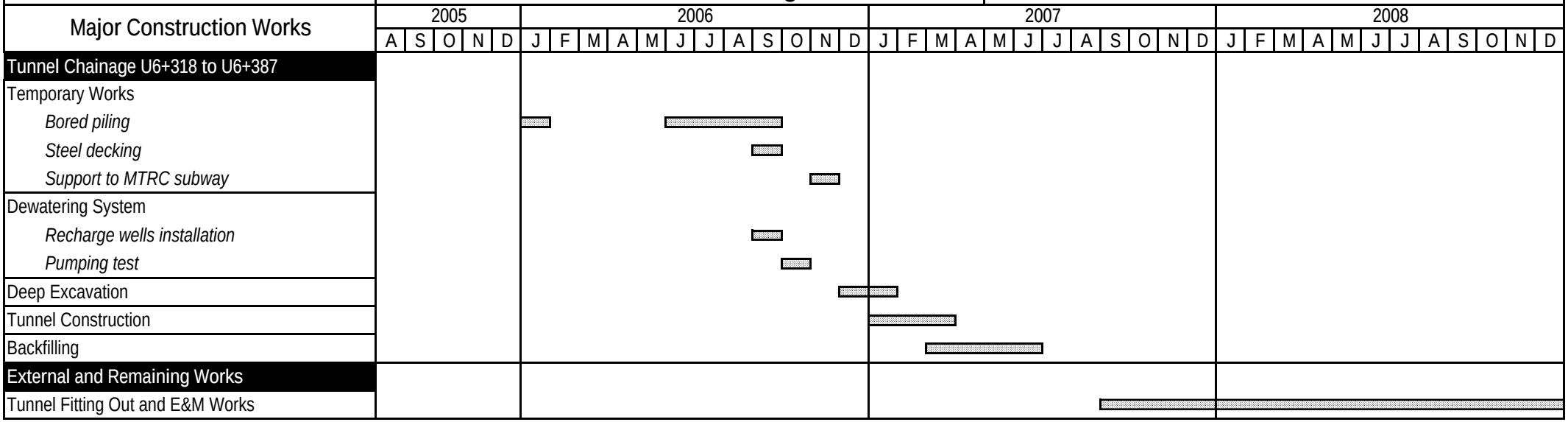
Major Construction Works	2005					2006										2007											2008										
	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Tunnel Chainage U6+162 to U6+214																																								
Temporary Works																																								
Pipe piling																																								
Steel decking																																								
Bridge underpinning																																								
Dewatering System																																								
Recharge wells installation																																								
Pumping test																																								
Deep Excavation																																								
Tunnel Construction																																								
Backfilling																																								
Tunnel Chainage U6+214 to U6+266																																								
Temporary Works																																								
Pipe piling																																								
Dewatering System																																								
Recharge wells installation																																								
Pumping test																																								
Deep Excavation																																								
Tunnel Construction																																								
Backfilling																																								
Tunnel Chainage U6+266 to U6+318																																								
Temporary Works																																								
Bored piling																																								
Dewatering System																																								
Recharge wells installation																																								
Pumping test																																								
Deep Excavation																																								
Tunnel Construction																																								
Backfilling																																								

TENTATIVE WORKS PROGRAMME

Contract No. & Name	KDB300 Tunnels - Jordan road to Yau Ma Tei Vent. Bldg.

中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGRG. (HONG KONG) LTD.

Date : 1 October 2005

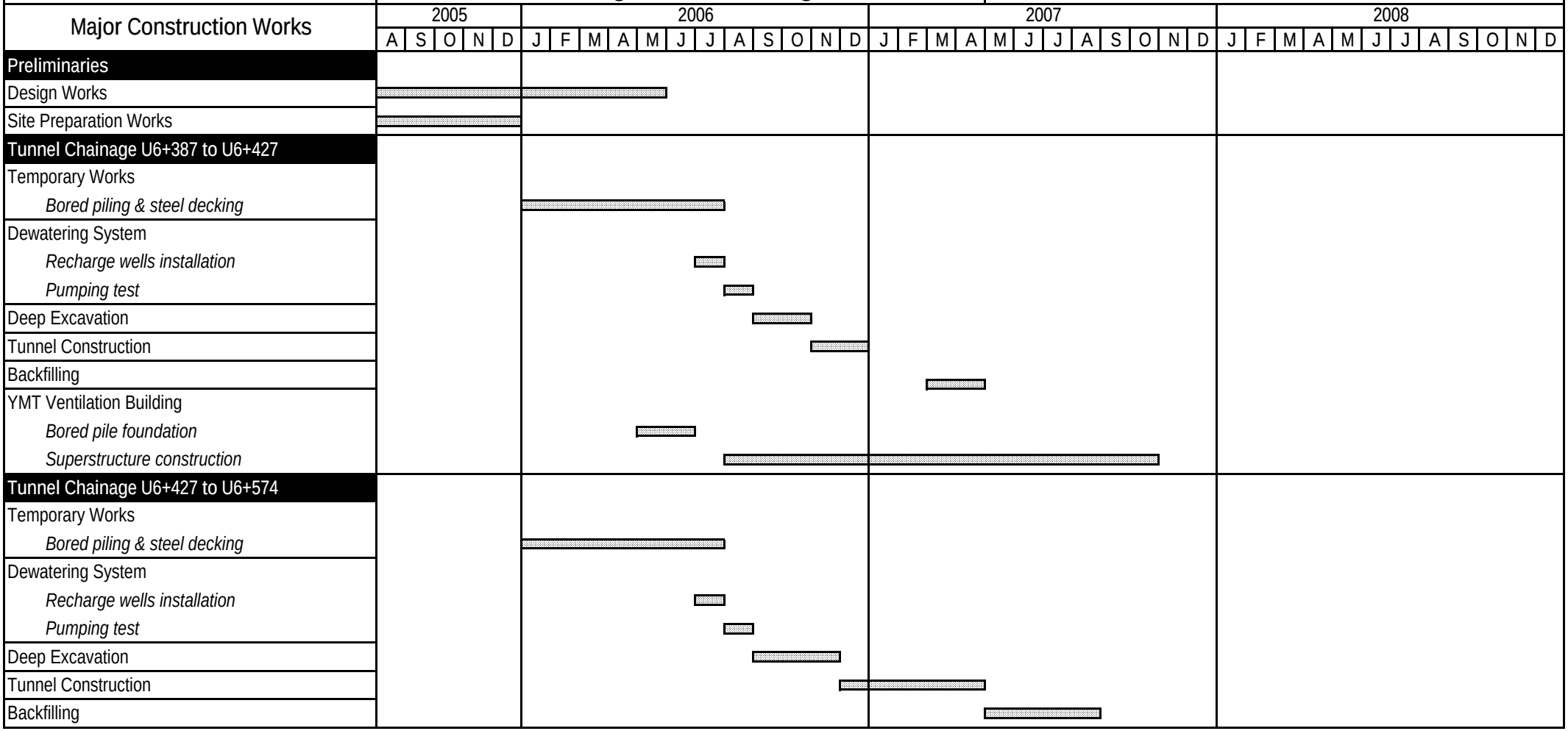


TENTATIVE WORKS PROGRAMME

Contract No. & Name	KDB400 Tunnels - Yau Ma Tei Vent. Bldg. to Nam Cheong Overrun

中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGRG. (HONG KONG) LTD.

Date : 1 October 2005

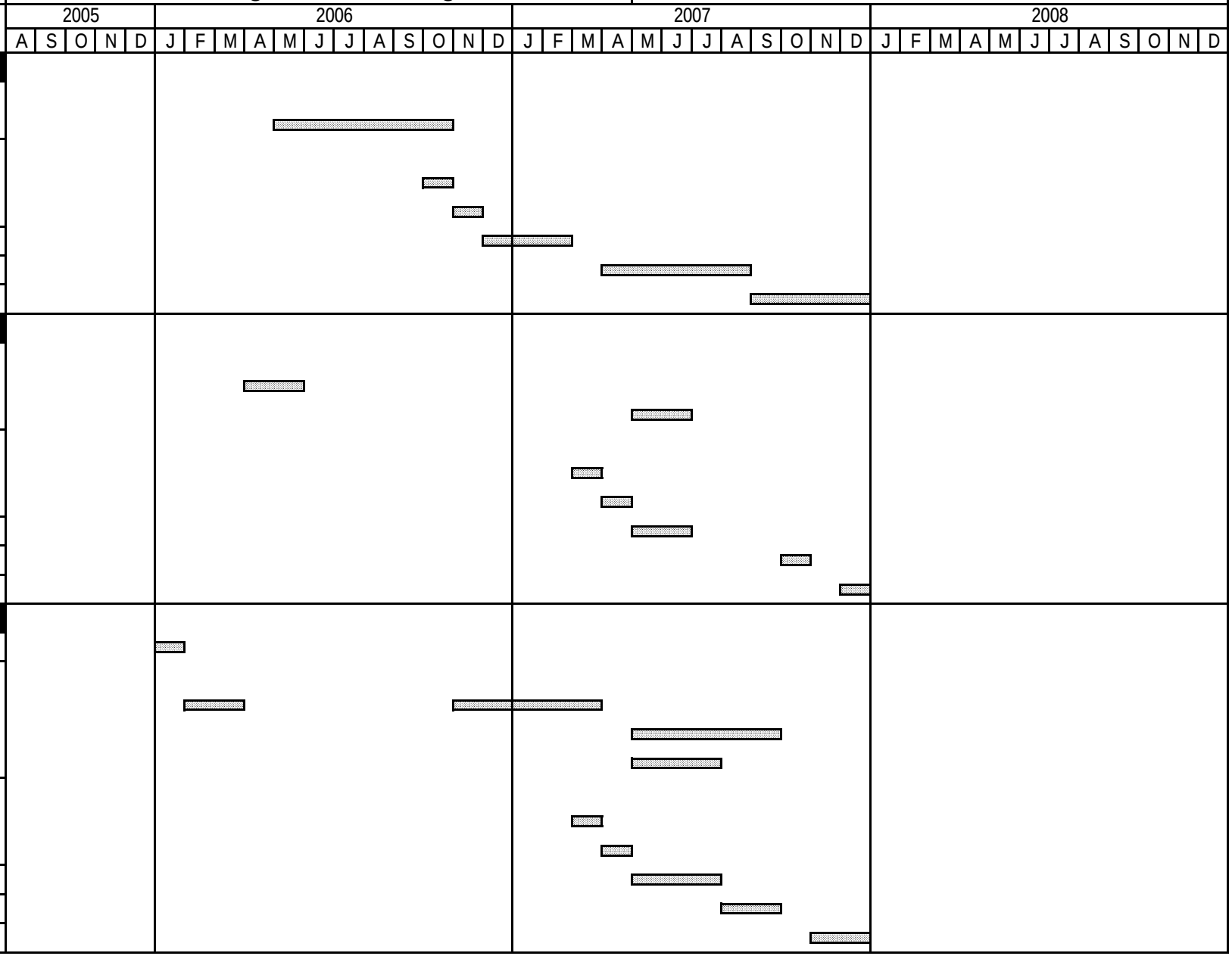


TENTATIVE WORKS PROGRAMME

Contract No. & Name	KDB400 Tunnels - Yau Ma Tei Vent. Bldg. to Nam Cheong Overrun

中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGRG. (HONG KONG) LTD.

Date : 1 October 2005

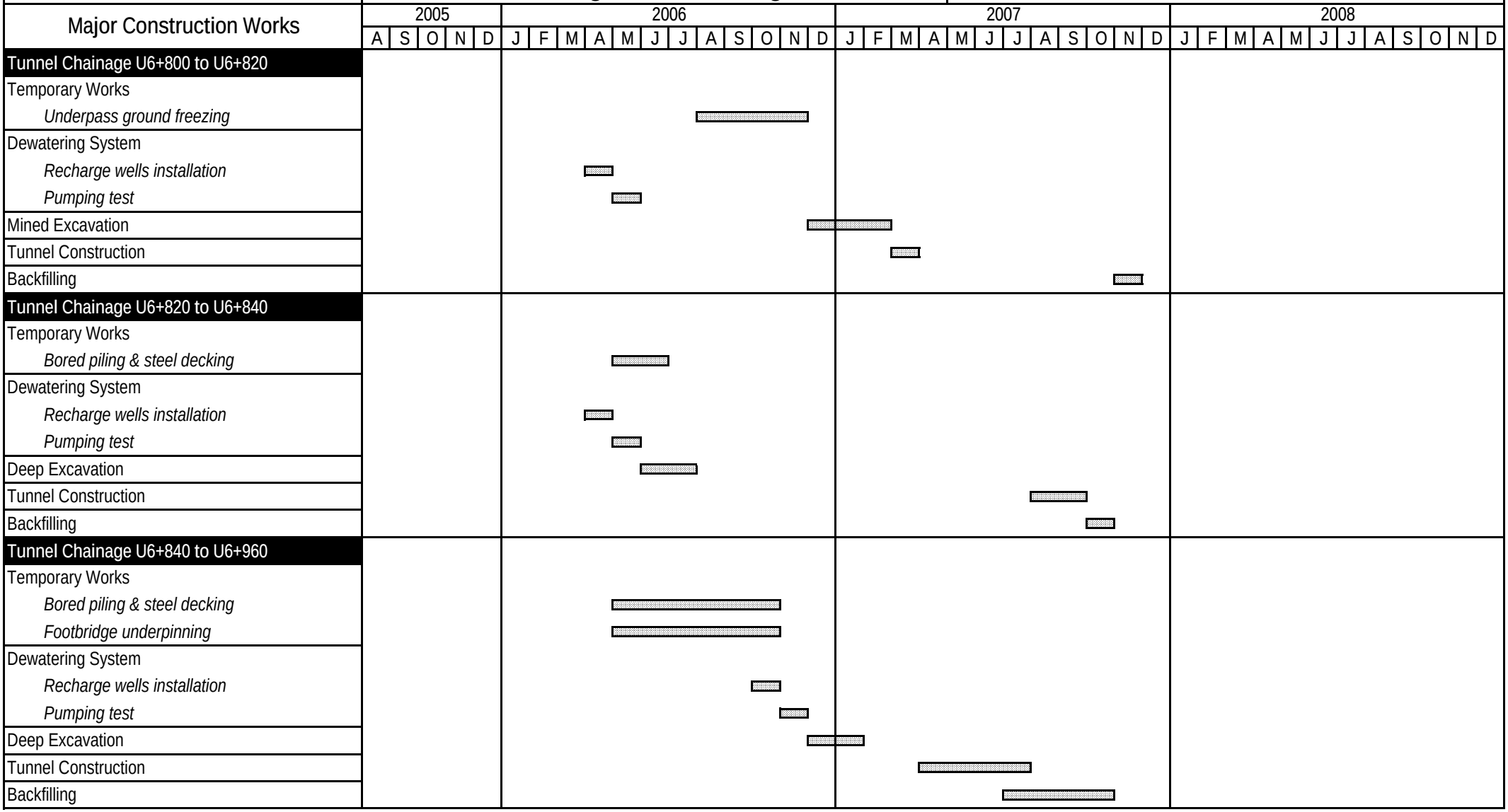


TENTATIVE WORKS PROGRAMME

Contract No. & Name	KDB400 Tunnels - Yau Ma Tei Vent. Bldg. to Nam Cheong Overrun

中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGRG. (HONG KONG) LTD.

Date : 1 October 2005

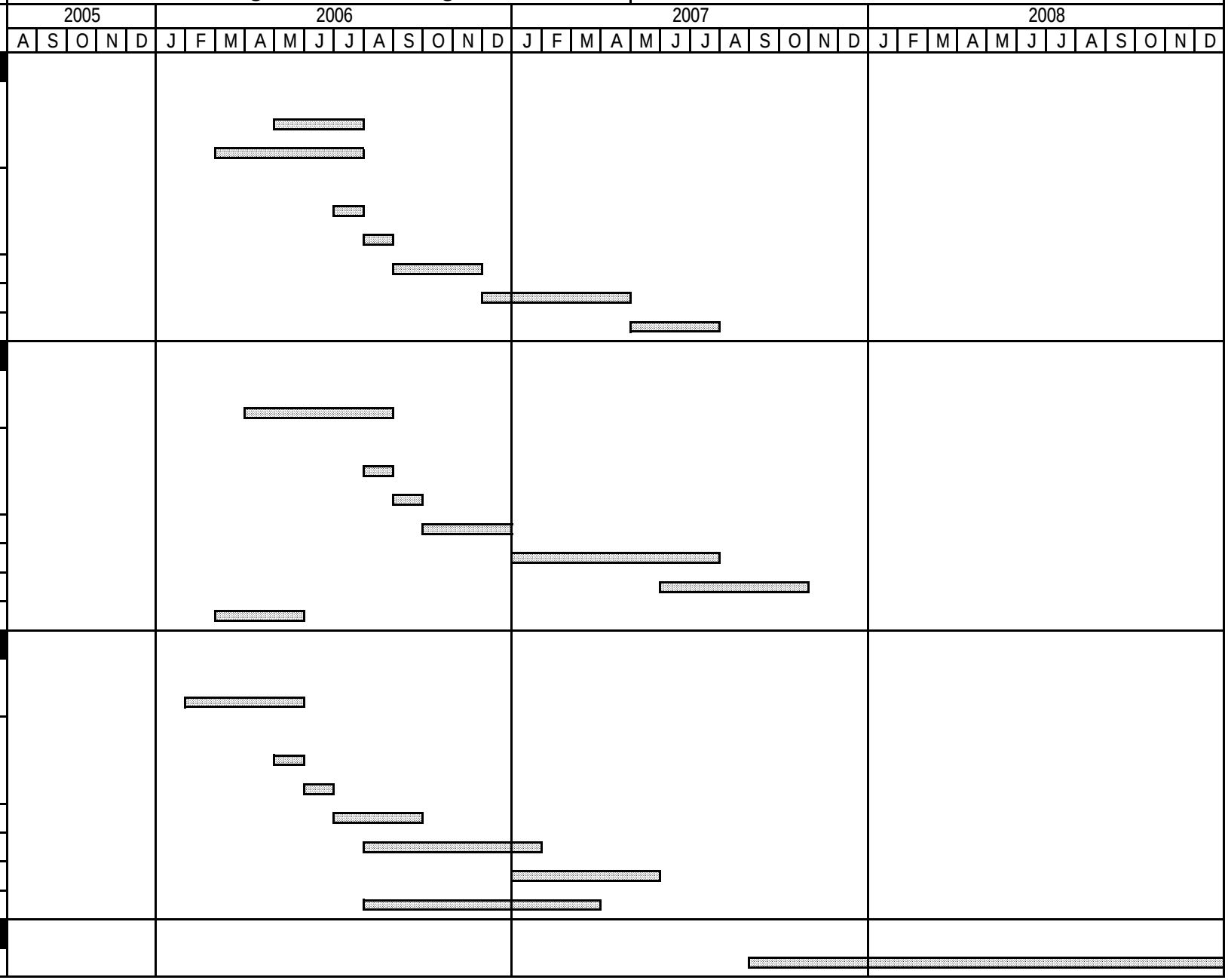


TENTATIVE WORKS PROGRAMME

Contract No. & Name	KDB400 Tunnels - Yau Ma Tei Vent. Bldg. to Nam Cheong Overrun

中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGRG. (HONG KONG) LTD.

Date : 1 October 2005



APPENDIX B

4.2 Environmental Policy

4.2.1 Content of Environmental Policies

China State Construction Engineering (H.K.) Limited

Environmental policy

(English Translation)

The core business of China State Construction Engineering (Hong Kong) Limited (hereinafter referred to as "the Company") is the design and construction of multi-disciplinary projects, including building, civil, foundation and construction products projects. It is the Company's policy to protect the environment likely to be affected by the Company's operations. The Company shall take all reasonably practicable steps to ensure strict compliance with both statutory and contractual requirements in all respects. The Company has, in accordance with the requirements of ISO 14001 : 1996 and under the supervision of the Company's Environmental Protection Committee and Environmental Manager, implemented the Company's environmental management system and formulated its environmental objectives and targets. The Company is committed to prevent environmental pollution, reduce construction wastes and minimize the consumption of natural resources. The Company shall provide environmental education and training, as well as establish effective communication and consultation channels, in order to benefit its clients, staff and general public. The Company shall continuously review the implementation status of the environmental management system and report to the Company's Environmental Protection Committee, in attempts to continuously improve the environmental management system and the Company's overall performance.

The Environmental Management Manual sets out the Company's pertinent management system. As environmental protection forms part of the Company's Operation Procedures, it is mandatory therefore that all employees shall fully conform to the Environmental Management Manual and the aforesaid procedures.

ZHOU Yong
President
1st February, 2003

APPENDIX C

Details of the Key Personnel for Environmental Management

Name	Position	Contact No.	Contract Team		% of time over the environmental matters
			KDB300	KDB400	
Dave Chan	Project Manager	9027 4422	✓	✓	10 %
Brian Kam	Environmental Manager	9456 9541	✓	✓	100 %
Adi Lee	Environmental Team Leader	2911 2729	✓	✓	100 %
Roger Cheung	Deputy Project Manager	9195 0746		✓	10 %
C.S. Yeung	Sr. Construction Manager	9480 6245	✓		10 %
F.M. Chung	Section Agent	9623 0471	✓		5 %
Eric Mak	Section Agent	9177 3554	✓		5 %
Calvin Leung	Section Agent	9127 9876		✓	5 %
Sam Chow	Contractor’s Environmental Protection Officer	9477 6019	✓	✓	100 %
K.T. Tang	Senior Engineer	9473 4771	✓		5 %
Bryan Tam	Senior Engineer	9226 2991		✓	5 %
W.K. Ho	General Foreman	9281 7677	✓		10 %
K.K. Lam	General Foreman	9308 0838	✓		10 %
C.M. Lam	General Foreman	9499 9860		✓	10 %
H. Leung	General Foreman	9439 1374		✓	10 %

APPENDIX D

ENVIRONMENTAL SITE INSPECTION CHECKLIST		中國建築工程(香港)有限公司 CHINA STATE CONSTRUCTION ENGRG. (HONG KONG) LTD.			
Contract No. & Name	KDB300 : Tunnels - Jordan Road to Yau Ma Tei Vent Bldg				
	KDB400 : Tunnels – Yau Ma Tei Vent Bldg to NAC Overrun	**Ref. No.**	WEW -	**Form No.**	ESIC

PARTICULARS

Date of Inspection :		**Time :**	
Attendants :	(ER-KCRC) :		
	(IEC) :		
	(ET) :		
	(CSCE) :		
Site(s) Inspected :	KDB300 / KDB400		
Weather Condition :	Sunny/ Fine/ Overcast/ Drizzle/ Rain/ Storm	**Wind :**	Calm/ Light/ Breeze/ Strong
Temperature :	°C	**Humidity :**	High/ Moderate/ Low

RESULTS OF INSPECTION

Item	Observed Issues	Measure Implemented			Location	Corrective Actions Recommended or Remarks
		Yes	No	N/A		
1. Licenses and permits						
1.1	Updated EP copy be displayed on notice boards/ vehicular site entrance?					
1.2	Valid CNP, if any be posted on notice boards/ vehicular site entrance?					
1.3	The licences/ permits available for inspection? • Effluent Discharge Licence • Chemical Waste Producer Registration • Disposal Trip Ticket for Chemical Waste • Dumping Licence under DASO					
2. Noise Pollution Control						
2.1	Temporary hoarding of 2.4m high installed at site boundaries section directly facing the NSR?					
2.2	Movable barrier installed to shelter the operation of concrete lorry mixer, concrete pump truck, dump truck/ lorry and hydraulic breaker facing Man King Building (at about chainage U5+500 to U5+700) and Olympian City Phase 3 (at about chainage U7+200 to U7+300)?					
2.3	The 100 tunnel section in front of Man King Building be constructed in 2 sub-section, each about 50m?					
2.4	Sequential site operation, where applicable to avoid excessive plants working at the same time?					
2.5	Site plants be orientated so that the noise is directed away from NSRs?					
2.6	Material stockpiles and container site offices be situated at strategic location serving to screen noise from construction activities?					
2.7	Site plants not being used switched off or throttled down?					
2.8	Built-in noise minimisation features (e.g. acoustic shield) used for all powered mechanical equipment?					
2.9	All fire doors and non-essential openings kept closed at all times to prevent a reduction in the acoustic performance of the enclosure? (i.e. power generator or air compressor require door kept closed)					
2.10	The silenced equipment used where practicable? (i.e. noise label for air compressors, and well maintenance)					
3. Air Pollution Control						
3.1	Exposed spoil areas of KDB300 & KDB400 be watered at least twice a day?					
3.2	Hoarding of not less than 2.4 m high from ground level provided along the entire length except for a site entrance or exit where a site boundary adjoins a road, streets or other area accessible to the public?					
3.3	Vehicle-washing facilities provided and well maintained at designated vehicle exit points?					
3.4	All vehicles washed to remove any dusty materials from their body and wheels before leaving the site?					

Item	Observed Issues	Measure Implemented			Location	Corrective Actions Recommended or Remarks
		Yes	No	N/A		
3.5	All vehicles carrying dusty loads sheeted over prior to leaving the site?					
3.6	The portion of road leading to construction site within 30m of vehicle entrance or exit kept clear of dusty materials?					
3.7	Every main haul road kept clear of dusty materials or sprayed with water so as to maintain the entire road surface wet?					
3.8	Excavated dusty materials or stockpile of dusty materials covered entirely by impervious sheeting, or sprayed with water so as to minimise dust impact, or other measures such as hydroseeding?					
3.9	Every stock more than 20 bags of cement covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides?					
3.10	No stockpile of dusty materials extending beyond the pedestrian barriers, fencing or traffic cones?					
3.11	All dusty materials sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty material wet?					
3.12	The vehicle speed within the worksite limited to 10 kph, except for properly formed and maintained access roads?					
3.13	The working area of excavation sprayed with water immediately before, during and immediately after the operation so as to maintain the entire surface wet?					
3.14	Site plant sand equipment well maintained? (i.e. without black smoke from powered plant)					
3.15	No open burning observed on site?					
4. Water Pollution Control						
4.1	Surface run-off from the construction sites directed into storm drains via adequately designed wastewater treatment facilities such as sand traps, silt traps and sediment basins to where stormwater properly directed via channels, earth bunds or sand bag barriers on site?					
4.2	Silt removal facilities, channels and manholes properly maintained? (i.e. the deposited silt and grit removed regularly, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times)					
4.3	All exposed soil areas or open stockpiles minimised to reduce the potential for increased siltation, sediment runoff, and erosion? And, if unavoidable, exposed soil surface and open stockpiles temporarily covered?					
4.4	Manholes adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system?					
4.5	All vehicles and plants cleaned before leaving the construction site to ensure that no earth, mud or debris is deposited by them on roads?					
4.6	Any chemical toilets provided on-site be properly maintained and their sewage be tankered away regularly?					
4.7	Are surface run-off control measures in place and are they adequate maintained? (i.e. Channels, earth bunds or sand bag barriers shall be provided on site to properly direct stormwater to silt removal facilities such as sand traps, silt traps and sediment basins).					
4.8	Water pumped out from trenches or foundation excavations discharged via silt removal facilities?					
4.9	Adequate provision of chemical toilet and sewage holding tanks for handling the construction sewage generated by the workforce and sewage be collected by a licensed collector for disposal?					
4.10	Have the extent of baseline groundwater contamination along the tunnel alignment been updated?					

Item	Observed Issues	Measure Implemented			Location	Corrective Actions Recommended or Remarks
		Yes	No	N/A		
4.11	Groundwater recharge wells be selected at places where groundwater quality will not be affected by the recharge operation.					
4.12	Groundwater monitoring wells be installed to monitor the effectiveness of the recharge operation and the groundwater level at the monitoring well be monitored during the recharge period to ensure that there is no likelihood of locally risen groundwater level thus no transfer of pollutants beyond the site boundary?					
4.13	Contaminated groundwater recharged back into the ground via recharge wells?					
4.14	Free product encountered be removed prior to recharge?					
4.15	The groundwater be treated appropriately prior to recharging should the pollutants of recharging groundwater exceed the baseline limit					
5. Waste/ Chemicals Management						
5.1	The worksite free from general waste? (i.e. debris and rubbish accumulation avoided?)					
5.2	Provision of sufficient waste disposal points/ receptacles and regular collection for disposal?					
5.3	Fuel tanks and chemical wastes properly stored in accordance with the statutory requirements (i.e. on a hardstanding, within a bund with a capacity equal to 110% of the largest drum volume, enclosed and locked area which is labelled)?					
5.4	Sorting of C&D materials on-site to recover the inert portions for reuse or disposal to designated outlet?					
5.5	No observable non-inert materials mixed with inert C&D materials?					
5.6	Wood, steel and other metals separated for re-use and / or recycling to minimise the quantity of waste to be disposed?					
5.7	Cardboard and paper packaging recovered on site whenever possible?					
5.8	Proper management of temporary storage areas to facilitate collection and/ or sorting of waste on-site?					
5.9	Disposal of C&D materials strictly followed the trip ticket system?					
5.10	Chemical wastes including asbestos-containing materials separated for special handling and collected by a licensed chemical waste collector?					
5.11	Record of quantities of waste generated, recycled and disposed properly kept and easily retrieved for inspection?					
5.12	Uncontaminated alluvial/ marine deposits and contaminated marine deposits be separately excavated as per the approved sediment quality report?					
5.13	The trucks for transporting the marine deposits be leach proof and be covered the load with impervious sheeting to prevent the watery content from leaking and splashing during the voyage to the barging facility?					
5.14	Excess material be cleaned from the decks and exposed fittings of the transportation vessel before moving out and the excess materials not dumped into the sea except at the approved locations?					
5.15	Adequate freeboard be maintained on barge to ensure that decks are not washed by wave action?					
5.16	The bottom of the dumping vessel be fitted with tight fittings seals to its bottom openings to prevent material leakage during the voyage?					
5.17	Contaminated marine deposits be transported by split barge of not less than 750m3 capacity and capable of rapid opening and discharge at the disposal site?					
5.18	Dumping license obtained from EPD and conditions of the license complied at all times?					

Item	Observed Issues	Measure Implemented			Location	Corrective Actions Recommended or Remarks
		Yes	No	N/A		
6. Mitigation of Landscape & Visual Impacts						
6.1	The stockpile be covered with visually unobtrusive sheeting in subdued 'camouflage' colour tone to prevent dust and dirt spreading to adjacent landscape areas and vegetation, and to create a neat and tidy visual appearance?					
6.2	Security lighting directed downward into the work sites/ areas to prevent glare to the surrounding receivers?					
6.3	Cleanliness and tidiness of the hoardings be maintained?					
6.4	The noise barrier be designed so as to minimize adverse visual impacts on adjacent receivers.					

Remarks / Conclusion / Observations/ List of Actions:

Signatures

ET's Rep.	Contractor's Rep.	IEC's Rep.	ER's Rep (KCRC)
Name :	Name :	Name :	Name :

APPENDIX E

FLOWCHART OF COMPLAINT HANDLING PROCEDURES