
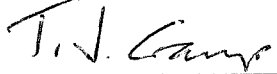


Hong Kong Convention and Exhibition
Centre, Atrium Link Extension

Executive Summary

March 2006

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**HONG KONG CONVENTION AND EXHIBITION CENTRE
ATRIUM LINK EXTENSION**

ENVIRONMENTAL IMPACT ASSESSMENT

EXECUTIVE SUMMARY

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1 INTRODUCTION

Background of the Project

- 1.1 Since the Hong Kong Convention and Exhibition Centre (HKCEC) was completed in 1988 (Phase I) and extended in 1997 (Phase II), demand for ever-larger trade fairs there has kept increasing. The HKCEC already operates beyond capacity during peak seasons. Several mega trade fairs hosted annually in the HKCEC for light consumer goods, such as electronics, utilize all available space, including convention halls and meeting rooms. There are some 3,300 local companies on the waiting list of mega fairs organized by the Hong Kong Trade Development Council (TDC) alone. These exhibitors, mostly small and medium-sized enterprises, are eager to participate but are unable to because of insufficient space.
- 1.2 The TDC has proposed to expand the existing facilities to provide essential room for Hong Kong's leading trade fairs to be held at the HKCEC. The Project is located in the North Wan Chai District and will occupy the aerial space between Phase I and Phase II of the HKCEC. The new Atrium Link Extension (ALE) spanning across the water channel between Phase I and Phase II of the HKCEC will accommodate 3 main levels of Exhibition Hall Extensions. The level of the main roof of the Extension will be of similar height as that of the podium roof of the Phase I building. A northern row of permanent supporting columns will be located on land close to Expo Drive Central and similarly a southern row will land near to Convention Avenue. There will be no permanent intermediate columns in the waterway. **Figures 1.1** show the location of the proposed Atrium Link Extension (ALE).

Design of the Project

- 1.3 The ALE allows Hall 1, Hall 2 and Hall 3 of the HKCEC Phase II to expand southward at different levels. This will provide additional exhibition space of 19,400 m². In this way, upon completion of the ALE, the three exhibition halls of HKCEC will be enlarged, creating space for 1,000 additional standard booths. **Figure 1.2** shows the longitudinal section of the proposed ALE.
- 1.4 The existing major exhibition halls of the HKCEC Phases I and II are currently connected by the multi-level Atrium Link, which is used for circulation, light exhibition and registration. The proposed extension of the Atrium Link will achieve better integration of the centre, as the halls in both phases, and not just the lobby spaces, will be extended to become effectively contiguous.
- 1.5 The proposed Extension is designed to present minimal impact to the exterior appearance of the HKCEC so that the existing landmark architectural features will not be affected. The main portion of the Extension will be of a similar height to the podium roof of the existing Phase I podium. The new Extension, which is confined within the width and rooflines of Phase I and Phase II, will not create any

visual obstruction to nearby buildings. Floors of the Extension are successively stepped back on the east and west elevations to reduce the scale and bulk of the new structure. The main trusses on the Extension are to be curved in order to achieve continuity of the existing roof profile.

- 1.6 The proposed Extension will not involve any reclamation. The Extension will be supported by five trusses spanning over 85 metres across the existing water channel. The northern row of the supporting columns will land on Expo Drive Central while the southern row of supporting columns will land on Convention Avenue. There will be no intermediate columns in the water channel.
- 1.7 The marine piles will be removed by means of pile extraction method upon completion of the Atrium Link Extension (ALE). No dredging of marine sediment would be required using the pile extraction method, and therefore it would not cause any adverse impact on water and sediment quality. Also, there would be no need for sediment transportation and disposal arrangement.

Consideration of Alternatives

Project Design

- 1.8 Apart from the current design, there are two alternative schemes, namely, Scheme 1 with larger footprint without intermediate column support; Scheme 2 with the same footprint as Scheme 1 but with intermediate column support in the existing waterway between Phase I and Phase II of the HKCEC (see **Figures 1.3 to 1.5**).
- 1.9 With the scheme of a large footprint, the ALE would block the proposed vent building for the future MTR North Island Line. Also, it will cause visual obstruction from the nearby buildings in particular the hotels at HKCEC Phase 1.
- 1.10 Regarding Scheme 2, the presence of permanent column support may obstruct the flow and reduce the flushing capacity of the sea channel between Phase I and Phase II of the HKCEC. The changes in the flushing capacity may affect the dispersion of pollutants discharged from the nearby stormwater culverts and may affect the water quality of the nearby cooling water intakes and saltwater pumping station.
- 1.11 In order to minimize visual impact and water quality impact as far as practicable, the current design has been proposed.

Construction Method

1.12 Owing to the site constraint i.e. the site is mainly on and across the existing waterway, hence, the structure will more or less be supported by the roof trusses which are supported on the columns at both end more than 50m above ground, instead of some typical structures that are supported on columns. Because of the inherent structural configuration, the top down construction method will be adopted instead of bottom up for the super structure.

1.13 Pilings will be placed without much allowance for variations from the conventional method. Moving the pile rigs to the position and then drill the holes to the founding level with casings or without casings. The only variations in the construction method that could be allowed is the extent of the temporary working platform over the waterway during the construction stage. Three options have been considered as follows:

Option 1: Cover the whole waterway with temporary working platform (see **Figure 1.6**)

Option 2: Construct three individual temporary working platforms at the northern and southern shoreline of sea channel in between Phase I and Phase II of the HKCEC (see **Figure 1.7**)

Option 3: Construct a 40m x 75m temporary working platform adjacent to the east bridge (see **Figure 1.8**)

1.14 Amongst these three options, only Option 2 and Option 3 could meet the requirement on the number of temporary marine piles as stipulated in the Gazette Notice No. 5415 under Foreshore and Sea-bed (Reclamations) Ordinance. In terms of water quality, Option 2 is preferable to Option 3 as the effective flow area in the main flow directions would be larger under Option 2.

2 PROJECT DESCRIPTION

2.1 The major works activity for the Atrium Link Extension will comprise the following:

- Construction and demolition of the temporary footbridge;
- Demolition of the existing Atrium Link;
- Construction and demolition of a temporary working platform;
- Construction of foundations and pile caps for the Atrium Link Extension; and
- Construction of superstructure for the Atrium Link Extension.

2.2 Construction works are expected to commence in May 2006 and to be completed by March 2009. Upon completion of the proposed ALE, Halls 1 and 2 at Level 2 and Level 5 of the Phase II development will be extended by 7,200 m² each while Hall 3 at Level 7 will be extended by 5,000 m². Related circulation and support areas of these Halls will be correspondingly enlarged. The total gross

floor area of the Extension, including circulation and support areas, will be about 49,100 m².

3 KEY FINDINGS OF THE ENVIRONMENTAL IMPACT ASSESSMENT

Air Quality

Construction Phase

- 3.1 Dust emission from the site is an area of the concern for the construction phase of the Project. TSP would be generated from construction activities. In view of limited scale of construction area and no dusty construction activities such as excavation and site formation, the predicted TSP level at the ASRs were low and within the acceptable criteria, with the incorporation of dust control measures stipulated in the *Air Pollution Control (Construction Dust) Regulation*. These dust mitigation measures and good site practices shall be incorporated into the contract clauses. Environmental monitoring and audit programme was also recommended to monitor the effectiveness of implementation of recommended dust suppression measures during construction.

Operational Phase

- 3.2 Two assessment scenarios of operation phase of the Project, Long-term Scenario and Interim Scenario, have been assessed. For the Long-term Scenario, cumulative air quality impact arising from vehicular emissions from existing and planned roads with Central Reclamation Phase III (CRIII), Central-Wanchai Bypass (CWB) & Wanchai Development Phase II (WDII); tunnel portal emissions from the CWB westbound slip road; portal emission from Atrium Link Extension, planned deckovers along Road P2 and deckover over Expro Drive; and vent shaft emission from CWB Central Ventilation Building was assessed. For the Interim Scenario, cumulative air quality impact arising from vehicular emissions from existing roads, portal emission from Atrium Link Extension and deckover over Expro Drive was assessed.
- 3.3 For Long-term Scenario, results indicated that all representative ASRs except some fresh air intakes at Renaissance Harbour View Hotel (ASR A4), Hong Kong Convention and Exhibition Centre Phase I (ASR A5) and Grand Hyatt Hotel (ASR A6) would satisfy the Air Quality Objective (AQO). Other than ASRs A4, A5 and A6, the concentrations of 1-hour average NO₂, 24-hour average NO₂ and 24-hour average RSP of other representative ASRs were predicted to range from 59 to 136 µg/m³, 56 to 87 µg/m³, and 52 to 63 µg/m³, respectively. The re-diversion of these fresh air intakes to the new air vent shaft for the Atrium Link Extension is recommended to alleviate the impact. The air quality underneath the Atrium Link Extension would comply with the EPD In-Tunnel Air Quality Guidelines but would not comply with the AQO. According to the current Draft Wan Chai North Outline Zoning Plan, the planned land use underneath the Atrium Link Extension is "Road". However, in view of exceedance of AQO, the area

underneath the Atrium Link Extension would not be suitable for placing any air sensitive receivers.

- 3.4 In view of the proposed deckover, the background air quality outside the planned CWB eastbound tunnel would be different comparing with the condition predicted in the WDII EIA Study. However, the impact to the air quality in CWB tunnel would be alleviated as the design of CWB Ventilation Building would fulfil the In-tunnel air quality requirement as stipulated in the WDII EIA Report.
- 3.5 For Interim Scenario, results indicated that the air quality at all representative ASRs and the area underneath the Atrium Link Extension would satisfy the AQO. The concentrations of 1-hour average NO₂, 24-hour average NO₂ and 24 hour average RSP were predicted to range from 56 to 183 µg/m³, 55 to 88 µg/m³, and 52 to 63 µg/m³, respectively. Notwithstanding this, for the provision of good quality of indoor air, some fresh air intakes of Renaissance Harbour View Hotel (ASR A4), Hong Kong Convention and Exhibition Centre Phase I (ASR A5) and Grand Hyatt Hotel (ASR A6) located underneath the deck are still recommended to be re-diverted to the new air vent shaft for the Atrium Link Extension.

Noise Impact

Construction Phase

- 3.6 The nearest NSR (i.e. NSR N2 – Causeway Centre), which rely on openable window for ventilation, is located about 250 m away from the nearest worksite. In addition, Causeway Centre is substantially screened by two office buildings (i.e. Great Eagle Centre and Harbour Centre) in between. Based on the nature of the major construction works for the Project, the maximum SWL of the construction activities throughout the construction period would be estimated to be about 127 dB(A) by assuming all typical construction plants operated concurrently as a conservative estimation. Taking into account the noise reduction provided by the large separation distance and the screening from the nearby office buildings, the construction noise levels at NSR N2 would be about 64 dB(A) which would be well within the EIAO-TM daytime construction noise criteria of 75dB(A). Therefore, noise arising from the construction activities of the proposed Project would not have significant impact on the NSRs located in the vicinity of the proposed work areas. To minimize noise emissions, however, good site practices and environmental audit are recommended during the construction stage of the Project.

Operational Phase

- 3.7 In terms of operation noise impacts, the closest distance between proposed plant room and the nearest NSR (Causeway Centre) identified are about 250m. And, the nearest NSR is located behind two office buildings. Based on preliminary design information, the total SWL of the equipment in the plant rooms was estimated to be 116 dB(A) as a conservative assumption. Taking into account the

separation distance and the noise reduction provided by surrounding office buildings, the predicted noise levels at NSR N2 would be about 43 dB(A) which is comply with both daytime and nighttime criteria of 65 dB(A) and 55 dB(A) respectively. Adverse operation noise impact of the fixed plant on Causeway Centre would not be anticipated. However, appropriate noise reduction measures are recommended to minimize noise emissions.

Water Quality

Construction Phase

- 3.8 Short-term water quality impact could be associated with the proposed construction works. Impacts may result from the surface runoff from construction sites, sewage from on-site construction workers, wastewater from general construction activities and seabed disturbance from marine piling and marine pile extraction. Impacts could be controlled to comply with relevant standards in the *Water Pollution Control Ordinance* (WPCO) standards by implementing the recommended mitigation measures. Double layers of silt curtain are recommended to be installed around the marine piling and marine pile removal works. Good site practices and water pollution control measures are also recommended to minimize the water quality impacts. Therefore, unacceptable residual impacts on water quality would be unlikely. Monitoring of water quality is recommended to verify the effectiveness of the mitigation measures.
- 3.9 Hydrodynamics modelling was conducted to evaluate the flushing impact on the ALE sea channel due to the installation of marine piles for supporting the temporary working platform(s) and temporary footbridge in the sea channel between Phase I and Phase II of the HKCEC during the construction period. The modelling exercise was carried out based on a fully calibrated and verified model to ensure the model performance. Alternative layouts of temporary working platform(s) were considered in the hydrodynamics modelling. The modelling results concluded that the recommended layout (Option 2) would cause the least impact on the flushing capacity of the sea channel. Hydrodynamic modelling results indicated that the installation of temporary piles in the sea channel would inevitably reduce the flushing capacity of the sea channel. The impact is however considered only temporary and the overall influence on the flushing capacity of the sea channel during the construction period was predicted to be less than 5% under the recommended option. Given that the marine piles would last for a maximum of three years and would be removed after construction of the ALE, it is anticipated the overall impact on the water quality inside the channel would be insignificant. Refuse collection vessel is recommended to be mobilized on a need basis to collect any floating refuse trapped at the ALE sea channel during the construction period.

Operational Phase

- 3.10 It is proposed that the sewage arising from the proposed ALE to be discharged to the existing 400mm and 450mm diameter sewers along Convention Avenue and eventually to Wan Chai East Preliminary Treatment Works. Sewerage impact assessment was conducted to assess the potential impact on the existing public sewerage system due to the additional sewage flow. The findings of the sewerage impact assessment indicate that the Project would not cause any adverse impact on the existing public sewers. Moreover, there would be no adverse sewerage impact on the Wan Chai East Preliminary Treatment Works.
- 3.11 It is proposed to discharge the additional stormwater runoff arising from the proposed ALE to the existing 3,200mm (W) x 3,200mm (H) box culvert along Expo Drive East. Drainage impact assessment was conducted to assess the potential impact on the existing public drainage system due to the additional stormwater runoff. The drainage impact assessment concluded that no adverse impact on the existing public drainage system is anticipated as a result of the additional stormwater runoff.

Waste Management

Construction Phase

- 3.12 Waste types generated by the construction and demolition activities for the Atrium Link Extension are likely to include C&D material, general refuse from the workforce and chemical wastes from the maintenance of construction plant and equipment. Provided that these identified waste arisings are to be handled, transported and disposed of using approved methods and that the recommended good site practices are to be strictly followed, adverse environmental impacts would not be expected during the construction phase.

Operational Phase

- 3.13 The main waste types generated during the existing operation of the pedestrian link between Phase I and Phase II of the HK Convention and Exhibition Centre are general refuse generated on site by the public and staff. These include waste paper, food wrappings and beverage containers. It is estimated there would be a 5-7% increase ratio in future operation of the establishment. The handling, collection, transportation and disposal practices of the identified waste arisings in the future are anticipated to follow the existing arrangements currently in operation at the HKCEC.

Landscape and Visual Impact

Construction Phase

- 3.14 There will be some Moderate residual impacts due to the construction of the proposed HKCEC Atrium Link Extension:

LR1 – Urban Waterfront and Harbour

Mitigation measures will not be able to deal with the fact the construction will cover a significant area of the waterfront and the sea. The residual landscape impact during construction will be Moderate.

VSR1A – HKCEC “Old Wing”

With such close distance and prevailing view towards the New Wing (Phase II) and the Harbour, the hotels will still have much view to the construction even with mitigation measures. No matter how much temporary screen is provided, the construction still cannot be ‘hidden’ from the hotels. The residual visual impact during construction will be Moderate.

VSR1B – Wan Chai Waterfront

Even with mitigation measures, tourists enjoying and taking photos of the waterfront will still have much view to the construction, which is visually incompatible. It will be impossible and impractical to ‘hide’ the construction in such an open area. The residual visual impact during construction will be Moderate.

- 3.15 Key recommended landscape and visual mitigation measures include visual screening for adjacent hotels and HKCEC “New Wing” (Phase II) and “Old Wing” (Phase I), due consideration for construction site and related activities, transplanting of existing affected trees to adjacent open space and protection of existing unaffected trees.

Operational Phase

- 3.16 There will be only one Moderate residual impact due to the operation of the proposed HKCEC Atrium Link Extension for the scenario with all possible waterfront developments (e.g. Road P2, CWB and WDII currently under review):

VSR1B – Wan Chai Waterfront

With Road P2 and WDII, mitigation measures will not be able to deal with the significant increase in covered vehicular surface, inducing Moderate visual impact during operation.

- 3.17 Key recommended landscape and visual mitigation measures include, most importantly, the creation of

cascaded roofs to be landscaped with various in-situ planting and potted planting (30% of the roof area as planting area for the project will be achieved) and the improvement of the existing covered space underneath the proposed Atrium Link Extension with due consideration on sensitive façade treatment, hard landscape, soft landscape, finishes, and lighting elements. Other mitigation measures include suitable appearance design for building service elements, transplanting of existing affected trees to adjacent open space, provision of visual screens, interior layout rearrangements, and the reinstatement of existing footpaths along Convention Avenue and the existing open space near Fenwick Street. A plan showing the landscaped roof of the proposed Atrium Link is shown on **Figure 1.9**.

Environmental Monitoring and Audit

- 3.18 Environmental monitoring and audit (EM&A) requirements have been specified in an EM&A Manual. The EM&A Manual contains full details of proposed baseline and compliance monitoring programme, as well as performance specifications, audit requirements and monitoring procedures.

4 Overall Conclusion

- 4.1 The findings of this EIA have provided information on the nature and extent of environmental impacts arising from the construction and operation of the Project. The EIA has, where appropriate, identified mitigation measures to ensure compliance with environmental legislation and standards.
- 4.2 Overall, the EIA Report has predicted that the Project would be environmentally acceptable with the implementation of the proposed mitigation measures for construction and operation phases. An environmental monitoring and audit programme has been recommended to ensure the effectiveness of recommended mitigation measures.