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ACE Paper 19/2006
For advice

Report on the 95th Environmental Impact Assessment Subcommittee Meeting

Introduction

At its meeting held on 5 September 2006, the Environmental Impact Assessment (EIA) Subcommittee considered the EIA report on Emissions Control Project at the Castle Peak Power Station "B" Units. Separately, the Subcommittee considered the EIA report on Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai Drainage Improvement, Stage 1, Phase 2B – Kam Tin, Secondary Drainage Channel KT13 by circulation. The majority of Members agreed that the report could be considered by the Subcommittee without a presentation by the project proponent and could be endorsed without condition.

Advice Sought

2. Members are requested to advise whether the following two EIA reports should be endorsed without condition –

(a) Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai Drainage Improvement, Stage 1, Phase 2B – Kam Tin, Secondary Drainage Channel KT13; and

(b) Emissions Control Project at the Castle Peak Power Station "B" Units.

Views of the EIA Subcommittee

EIA report on Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai Drainage Improvement, Stage 1, Phase 2B – Kam Tin, Secondary Drainage Channel KT13
(ACE-EIA Paper 1/2006)

Need for the project

3. The Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai Drainage Master Plan Study identified flooding problems in Ma On Kong. The project is part of the recommendations of the study for upgrading the existing drainage capacity to alleviate local flooding problems.

Description of the project

4. An existing stream in Ma On Kong will be trained in order to alleviate flooding problems. The project includes the following key items of work (see Figures 1 and 2) –

(a) about 700 m of the stream will be widened and deepened to trapezoidal channels with gabion bank and bed (Section A and Section B);

(b) about 400 m of the bypass culvert, which is a twin cells concrete box culvert, will be constructed to connect two open channel sections;

(c) about 25 m of the meander will be modified; and

(d) ancillary infrastructure, such as vehicular/pedestrian crossing, maintenance access, etc., will also be constructed along the channel alignment.

5. The project is classified as a designated project under Item I.1(b)(vii) '*a drainage channel or river training and diversion works which discharge into an area which is less than 300 m from the nearest boundary of an existing conservation area*' and Item Q.1 '*a project partly in an existing conservation area*', Part I, Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO).

Members' views and conclusion of the Subcommittee

6. Members noted that a set of public comments was received by the Environmental Protection Department (EPD) which expressed concern about the Mikania colonization, Riparian vegetation, stream bed substratum and maintenance of the new channels (only one set of public comments was received during the public inspection period). Members shared the concerns. On the request of the Subcommittee, the project proponent (Drainage Services Department) provided response to the concerns before the Subcommittee meeting. Members noted the response at Annex A.

7. Having regard to the findings and recommendations of the EIA report and information provided by the project proponent, Members agreed by circulation that the EIA report could be endorsed without condition and that a presentation by the project proponent was not necessary. The Subcommittee endorsed Members' views and agreed to recommend the EIA report to the full Council for endorsement without condition. The Subcommittee also recommended EPD to monitor the commitments undertaken by the project proponent at Annex A in the context of the Environmental Monitoring and Audit process.

EIA report on Emissions Control Project at the Castle Peak Power Station "B" Units
(ACE-EIA Paper 2/2006)

Need for the project

8. To improve regional air quality, the Hong Kong SAR Government and the Guangdong Provincial Government have reached a consensus to reduce, on a best endeavour basis, the emissions of four major air pollutants, namely sulphur dioxide (SO_2), nitrogen oxides (NO_x), respirable suspended particulates and volatile organic compounds in the region by 2010. This project is proposed by the Castle Peak Power Company Limited (CAPCO) in response to the Hong Kong SAR Government's emission reduction initiatives.

Description of the project

9. The project is a material change to existing Castle Peak Power Station, an exempted designated project under the EIAO, and requires an environmental permit under section 9(4) of the EIAO. It is also a designated project under Schedule 2 Part 2 Item 16 *(decommissioning of a store for oil with capacity more than 200 tonnes)*, and Schedule 2 Part 1 Items G6 and K6 (*waste disposal facility for gypsum and chemical plant with storage capacity more than 500 tonnes*).

10. The project is located within the Castle Peak Power Station in Tuen Mun. The project is scheduled to start construction in the first half of 2007 for commissioning by end 2009. The project comprises the following key items of work –

(a) demolish existing facilities including a 4680 tonne capacity oil tank, etc.;

(b) relocate/re-route existing facilities including underground pipework, oil sump, etc.;

(c) install new NOx and SO_2 emission control equipment;

(d) provide storage for re-agents (urea and limestone) & by-products (gypsum); and

(e) provide additional berthing for loading and unloading of reagents and by-products.

Members' views

11. Members noted that the project was proposed by CAPCO in response to the Hong Kong SAR Government's emission reduction initiatives which involved installation of additional emission control facilities on the Castle Peak Power Station "B"

units to further reduce air emissions from the operations of the units. Members welcomed the project as it aimed at improving the environmental performance of the operation of power generation facilities. From the EIA perspective, it was necessary to assess the environmental impacts arising from the proposed project. Members noted that no public comments were received by EPD up to the date of the Subcommittee meeting (no public comments were received during the public inspection period). The meeting agreed to focus the discussion mainly on consideration of alternative emission control technologies, procurement strategy, design and performance, wastewater treatment, waste management, land contamination and extension of berthing facilities.

Consideration of alternative emission control technologies

12. On the consideration of alternative emission control technologies, the project proponent team explained that they had conducted comparative studies on a wide range of emission control technology options as contained in section 2 of the EIA report. Having regard to expected environmental benefits, potential environmental impacts, technological feasibility, procurement strategy of raw materials, plant design and relevant international standards, the Limestone Forced Oxidation Flue Gas Desulphurisation (LS-FGD) for SO_2 reduction and Selective Catalytic Reduction (SCR) for NO_x reduction were selected as the package of emissions control options for the purpose of the EIA Study. Lifecycle analysis had been conducted in assessing different emission control options.

Procurement strategy

13. On procurement strategy of raw materials, the project proponent team explained that they had conducted detailed studies on the sources of supply. Coal and limestone were sourced from a wide range of international markets, by long-term and spot purchase contracts, for high quality supplies in terms of environmental benefits. The emissions control project was designed to handle the typical international export coal quality as with the original boiler design. Coal specifications would not be worsened after installing the retrofitting facilities. The supply of high quality limestone would be important to ensure the quality of commercial-grade gypsum by-product. Upon Members' request, the project proponent provided further information on the procurement strategy of different materials for the retrofitted operations (item 1 of Annex B).

Design and performance

14. Members noted that the Castle Peak Power Plant had been operated for 25 years. Based on a detailed life assessment study conducted, the remaining operating life of the plant was expected to be another 25 years in broad terms.

15. Regarding the impact of the retrofitting project on the territory-wide air quality, the project proponent team explained that air pollution in Hong Kong was a

regional problem but they recognized that they had a significant role to play in reducing emissions in Hong Kong. While CAPCO contributed only about 5% of the total pollutants in the region, a high environmental performance standard for the power generation facilities was set by using the best available technologies to further reduce air emissions from the operation. This would enable Castle Peak Power Plant to be one of the best performing and leading coal-fired power plants in terms of environmental performance in the region. Table A.4 in the EIA report showed the significant emission reductions of SO_2 (86 to 91%), NO_x (72 to 83%) and particulate concentrations (44 to 66%) and hence air quality improvements at a large number of air-sensitive receivers in the study area under the worst-case concentration ratios measured in the wind tunnel.

16. The project proponent team noted Members' wish to further increase the removal efficiency of SO_2 and NO_x beyond the target levels. The team explained that the target levels of 90% for SO_2 and 80% for NO_x were very high in terms of international standards. They had to strike a balance on the removal efficiency of SO_2 and NO_x and the amount of limestone and ammonia to be added in the process which would produce the by-product of gypsum and possibility of ammonia slip respectively. The anticipated removal rates of SO_2 and NO_x were based on the standard of the design coals for the Castle Peak Power Plant.

17. The project proponent team noted Members' concern about the possible ammonia slip during the SCR process for NO_x reduction due to excess unreacted ammonia making its way to the flue gas. The team explained that in the process of removing about 80% of NO_x, the level of potential ammonia emissions would be very low. However, if the reduction level of NO_x were to be pushed beyond 80%, there might be a phenomenon of over-injection of ammonia, thereby increasing the chance of ammonia slip. Monitoring and control measures for ammonia slip were carefully considered (section 3.5.2 of the EIA report refers).

Wastewater treatment

18. On wastewater treatment, Members noted that there was information on the characteristics of treated effluents from the LS-FGD wastewater treatment system in the EIA report. However, there was no sufficient information on the characteristics of influents before treatment, justifications for the proposed wastewater treatment methods, and characteristics of the sludge from the wastewater treatment system. The project proponent team explained that the output of the LS-FGD process was mainly gypsum in solid form and the amount of effluent was relatively small. The wastewater would be treated on site prior to discharge to comply with all requirements of relevant Technical Memorandum and environmental ordinances. Upon Members' request, the project proponent provided relevant information (item 2 of Annex B). Having considered the additional information, Members recommended that –

(a) the project proponent should give considerations in the detailed design stage to the treatment of excess ammonia resulted from the SCR process (if SCR

was chosen as the final technology for controlling NO_x) which would end up in the wastewater;

(b) the project proponent should remove the excessive sulfide reagent used from the wastewater before discharging into the sea; and

(c) having regard to the presence of trace amount of metals in the wastewater, EPD should maintain vigilance in the scrutiny of the treatment plant design and monitoring of the discharged effluent.

Waste management

19. On waste management, members noted that about 240,000 tonnes of commercial-grade and 17,000 tonnes of lower-grade gypsum would be generated per year from the LS-FGD process and were concerned about the storage and outlets for the gypsum. The project proponent team explained that the LS-FGD was considered the best available technology from an environmental point of view as the by-product would be gypsum in solid form which had marketable value with ready markets for plasterboard and cement manufacturing. Low sulphur content coal and high quality limestone would be sourced which would enable the generation of commercial-grade gypsum and minimization of lower-grade gypsum. They were actively liaising with potential buyers and were confident to find outlets for the gypsum. Stocks pending for sale, probably in the initial period of the operation for establishing the market, would be stored at the site within the plant. Temporary storage at the Tsang Tsui Ash Lagoon would only be a fallback. There was no intention to dispose the gypsum at the landfills.

20. On Members' concern about whether there was licensing requirement for the temporary storage of gypsum at the Tsang Tsui Ash Lagoon, representative of the EPD clarified that no prior consent or specific licensing requirements under EPD's control was required for the fallback temporary storage of lower-grade gypsum in the Tsang Tsui Ash Lagoon. Nevertheless, the effluent discharge from the Ash Lagoon was subject to the control of the Water Pollution Control Ordinance (WPCO) and a discharge license under the WPCO had been issued to the Castle Peak Power Station. There would be a need for CAPCO to check in future if they needed to apply for variation of the discharge license.

21. On Members' concern about the level of oxidized mercury in the gypsum after the LS-FGD process, the project proponent team explained that it was their objective to produce commercial-grade gypsum which could be sold in the market. With careful selection of low-mercury coal and high quality limestone, the level of oxidized mercury in the gypsum would be very low.

22. In respect of the chemical composition of the lower-grade gypsum, the project proponent team said that the lower-grade gypsum had similar chemical contents as commercial-grade gypsum. The major difference was that it had a lower calcium

sulphate content than commercial-grade gypsum as there were very stringent specifications for commercial-grade gypsum. Upon Members' request, the project proponent provided further information on the quality of both commercial-grade and lower-grade gypsum (item 3 of Annex B).

Land contamination

23. On the potential problem of land contamination, Members noted that site investigation results indicated that there was small volume, about 50 m^3, of potentially contaminated soil (contaminated by Total Petroleum Hydrocarbon (TPH)) within the project site. All contaminated soil within the project site would be removed prior to start of construction. The EIA report recommended on-site treatment of contaminated soil adopting bioremediation. Members noted with concern that the site investigation results also indicated contamination of groundwater with about 3,000 microgram/litre of TPH. However, no action was recommended for treatment of the contaminated groundwater bearing in mind that the plant was located near the sea.

24. The project proponent team explained that the groundwater contamination was discovered by soil boring in isolated pockets and the source was suspected to be related to some minor oil leakage in the power plant over the years. The preferred remediation approach in handling similar situations in industrial sites would be the removal of the hydrocarbon-contaminated soil and the hydrocarbon content in the groundwater would be gradually decomposed by natural biological process over a period of about five to ten years. In terms of risk assessment on human health, guidelines would be set for construction workers in handling possible contaminated soil and groundwater. In the long run, ongoing monitoring measures would be taken to manage the site condition and ensure that it would not deteriorate.

25. Members noted that the groundwater contamination was due to sources outside the project boundary and the problem should be dealt with outside the scope of the present EIA report. Representative of the EPD explained that in the case of some other projects under which similar assessments based on risk-based approach were conducted, it might not be necessary to treat the contaminated groundwater because the Dutch levels were based on groundwater being extracted for domestic or related use. Members agreed to suggest the full Council report the observation on the potential problem of groundwater contamination in the site identified through the EIA Study to EPD and recommend the project proponent to deal with the issue as an operational issue of the existing facilities in the power plant and liaise closely with EPD on plans to manage the situation. The project proponent team assured Members that CAPCO, being a responsible company, would take initiative and work closely with the consultants to look into the problem as revealed through the present EIA Study and would share the plans with EPD.

Extension of berthing facilities

26. On Members' concern about the extension of the berthing facilities which involved dredging, the project proponent team explained that the berthing facilities were extended to accommodate the need of loading and offloading of vessels to ensure limestone supply and gypsum disposal from and to more distant locations in the international market throughout the remaining operating life of the power plant. With smaller scale berthing facilities, the limestone could only be sourced from nearby areas with lower-grade limestone which would limit the LS-FGD operation and generation of commercial-grade gypsum. Extensive studies had been conducted on the appropriate size of the berthing facilities for the coming 25 years to cater for marine vessels ranging from a few hundred tonnage to a few thousand tonnage and the proposed facilities were considered optimum.

Conclusion

27. Having regard to the findings and recommendations of the EIA report and information provided by the project proponent, the Subcommittee agreed to recommend the report to the Council for endorsement without condition. The Subcommittee also made the following recommendations and suggestions -

(a) to report the observation on the potential problem of groundwater contamination in the site identified through the EIA Study to EPD. The project proponent should deal with the issue as an operational issue of the existing facilities in the Castle Peak Power Station and liaise closely with EPD on plans to manage the situation;

(b) the project proponent should give considerations in the detailed design stage to the treatment of excess ammonia resulted from the SCR process (if SCR was chosen as the final technology for controlling NO_x) which would end up in the wastewater;

(c) the project proponent should remove the excessive sulfide reagent used from the wastewater before discharging into the sea; and

(d) having regard to the presence of trace amount of metals in the wastewater, EPD should maintain vigilance in the scrutiny of the treatment plant design and monitoring of the discharged effluent.

EIA Subcommittee Secretariat
September 2006

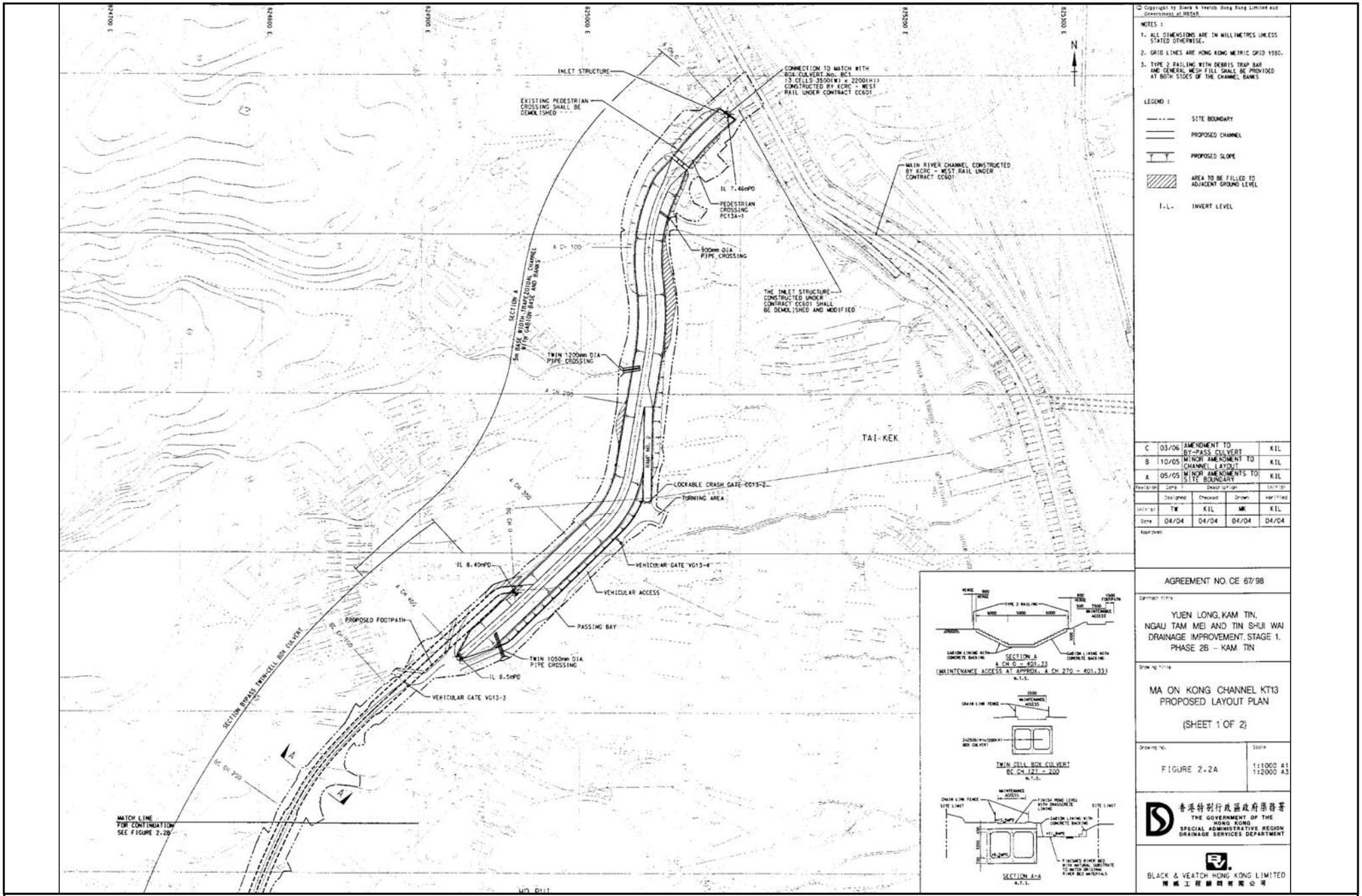

Figure 1 – Proposed Layout Plan (Northern section of KT13) [Adopted from Figure 2.2A in EIA Report]

Project Title – Yuen Long, Kam Tin, Ngau Tam Mei & Tin Shui Wai Drainage Improvement Stage 1, Phase 2B – Kam Tin - Secondary Drainage Channel KT13

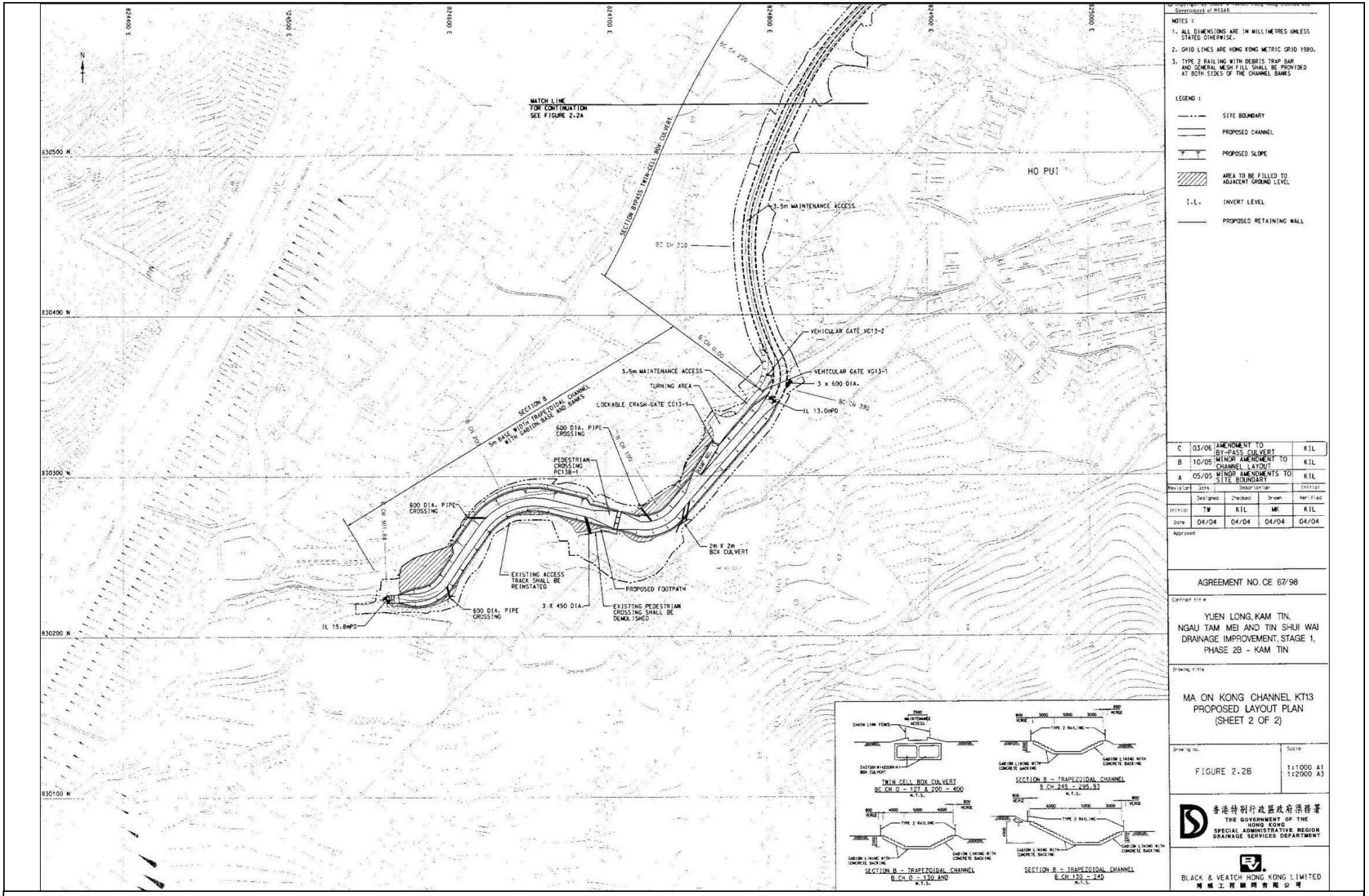

Figure 2 – Proposed Layout Plan (Southern section of KT13) [Adopted from Figure 2.2B in the EIA Report]

Project Title – Yuen Long, Kam Tin, Ngau Tam Mei & Tin Shui Wai Drainage Improvement Stage 1, Phase 2B – Kam Tin - Secondary Drainage Channel KT13