Architectural Services Department

PWP No. 016NB

Phased Reprovisioning of Cape Collinson Crematorium

Project Profile

November 2007

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1 BASIC INFORMATION

Project Title

1.1 The title of the proposed project is "Phased Reprovisioning of Cape Collinson Crematorium" (hereafter named as the Project).

Purpose and Nature of Project

1.2 The existing Cape Collinson Crematorium is located at Cape Collinson Road, Eastern District. It consists of four service halls with twelve cremators. The cremators were replaced in 1995 and 2001 respectively. Owing to the old design of these cremators and the site constraints, replacement of all the existing cremators is the only practical and reliable means to meet the current emission standards stipulated under BPM 12/2 (06) by Environmental Protection Department and to increase the capacity of the crematorium to meet rising demand on cremation.

1.3 As there is no other flat area available for the construction of a replacement crematorium under a single phase, it is only feasible to divide the development into two phases. The phasing and proposed scope of the proposed project includes:

Phase 1

Provision of 4 new cremators together with the necessary ancillary facilities at the adjoining site to the north of the existing crematorium.

(i) Two multi-purpose service halls, each with a clergyman room and a waiting room with catafalques leading to a cremation room;
(ii) Two joss paper burners;
(iii) Underground fuel tank;
(iv) One ash storage room and one pulverization room with a bone cremulator and dust-proof cabinets;
(v) Storerooms and dangerous goods stores;
(vi) Toilets
(vii) Parking spaces
(viii) Automatic Guided Vehicle (AGV) for transfer of coffins from cremation room to cremators;
(ix) Anti-burglary devices;
(x) Anti-bumping devices inside the cremation room;
(xi) CCTV system with recording device at strategic locations for monitoring purpose; and
(xii) Landscaping.

Phase 2

After the satisfactory commissioning of the new cremators under Phase 1, the existing crematorium will be demolished and removed. The facilities provided under Phase 2 are as follows:

(i) Six new cremators;
(ii) One multi-purpose service hall;
(iii) Mortuary;
(iv) Office accommodation;
(v) Refuse storage chamber; and
(vi) Landscaping.

Name of Project Proponent

1.4 Food and Environmental Hygiene Department (FEHD) is the Project Proponent. Architectural Services Department (ArchSD) acts as the works agent for FEHD, is responsible for the project management and implementation of the project.

Location and Scale of Project and History of Site

1.5 The project site is the site of the existing Cape Collinson Crematorium which consists of four service halls with twelve cremators. According to available information, it was first in use in 1962 with several alternation and development hereafter. The new crematorium will be developed in two phases. Site formation work will be carried out at the beginning of Phase 1 which involves extension of the existing car park area for the construction of an access road. After the site formation has been completed, a new crematorium with 4 cremators will be constructed to the north of the existing crematorium. During this period, all the 12 cremators in the existing crematorium will still remain in operation until the satisfactory commissioning of the new cremators under Phase 1 by 2011. After completion of the Phase 1 works, demolition of the existing crematorium, construction of another 6 cremators and 1 service hall will then be carried out in Phase 2. The total installed capacity of 4 cremators in Phase 1 and 6 cremators in Phase 2 would be approximately 680 kg/hour and 1,100 kg/hour, respectively.

1.6 The location plan and block plans of the new crematorium (Phase 1 and Phase 2) are shown in **Figures 1.1** to **1.3**.

Number and Types of Designated Projects Covered by the Project Profile

1.7 The Project is classified as a Designated Project under Category N.4 – A crematorium of Part I in Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO).

Name and Telephone Number of Contact Person(s)

1.8 All queries regarding the project can be addressed to:

Name: Mr. Y.M. Chan, Senior Project Manager 324 of Architectural Services Department
Address: 37/F Queensway Government Offices, 66 Queensway, Hong Kong
Telephone: 2867 4120

2 OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

Project Team

2.1 FEHD is the project proponent and is responsible for the operation of the proposed crematorium. ArchSD is the works agent who oversees and manages the Project. ENSR (Asia) HK Ltd is appointed by ArchSD to undertake an Environmental Impact Assessment (EIA) in accordance with the EIA Ordinance. Demolition and construction of the proposed crematorium will be carried out by contractor(s) to be appointed by ArchSD at a later stage.

Project Timetable

2.2 The exact time schedule and detailed design would not be available until all the requirements on environmental protection measures are determined. The following estimation on the overall time frame for the construction work may be taken as a reference.

Phase 1: April 2009 to January 2011
Phase 2: February 2011 to November 2013

Interaction with Other Projects

2.3 There is no interaction with other projects.

3 POSSIBLE IMPACT ON THE ENVIRONMENT

Decommissioning and Construction Phase

Air Quality

3.1 Potential air quality impact during the demolition of the existing coffin crematorium building and the body cremator, and the construction of the replacement crematorium is the fugitive emission of dust.

Dust from demolished cremators and chimneys may contain dioxins.

3.2 Asbestos is commonly used for heat insulation before the 1980's. Therefore, it is likely that the existing crematorium and body cremators, especially the chimneys, contain asbestos.

Noise

3.3 Noise will be generated during the demolition and the construction activities. Major activities including site formation, foundation, breaking and transferring of construction and demolition (C&D) materials and building works. The operation of powered mechanical equipment (PME) is required.

Water Quality

3.4 Wastewater generated from construction activities and surface runoff from the construction site during raining will contain high levels of suspended solids and may cause impact on the water body. Pollution may also be caused by other types of construction site wastewater such as sewage from site toilet. Reference will be made to the *Practice Note ProPECC 1/94 Construction Site Drainage* for proper collection of wastewater, water quality impact on the water sensitive receivers is unlikely.

Land Contamination

3.5 The existing crematorium and body cremator are equipped with underground fuel tanks and fuel pipes. In addition, the existing transformer room located within the site may be demolished subject to further investigation. Land contamination may exist if there has been fuel leakage, etc.

Waste Management

3.6 Excavated materials, general construction waste, chemical waste and general refuse will be generated from the demolition and construction works. The amount of such waste arising from the construction works is anticipated to be small.

Landscape and Visual

3.7 During the demolition and construction period, some trees and shrubs will be removed from the site. Tree survey will be carried out to identify the quantity, species and sizes of the affected trees.

3.8 Bare ground and the stockpiles of C&D materials will be screened by the site hoarding. The visual sensitive receivers (VSRs) are distant from the site and the natural terrain has blocked their line of sight to the site. This short-term impact would not be significant.

Hazard to Life

3.9 Building debris arising from demolition works of the cremators will likely contain pollutants and toxic substances that might be generated and accumulated during the combustion process of the existing cremators. Hazards may arise during handling, transportation and disposal of these contaminated materials.

Ecology

3.10 The subject site is disturbed by human activities associated with the operation of the existing crematorium. It is anticipated that the project would not cause adverse ecological impact, although some trees and shrubs might require to be removed during construction work.

Cultural Heritage

3.11 There are no declared monuments or graded historical buildings in the area of Cape Collinson. There will not be any impact on the site of cultural importance.

Operation Phase

Air Quality

3.12 Air pollutants such as particulate matters, organic compounds, inorganic gas, etc and odour from the new crematorium may affect the nearby air sensitive receivers (ASRs). The new cremators are of advance design such that emissions from them will comply with statutory requirements. In addition, a flue gas filtering system will be installed to further reduce the air pollutants concentration from the cremators. As such, the air pollution impact on the ASRs during the operation phase will be minimal.

3.13 The amount of joss paper burning is minimal. Administrative mitigation measures will be undertaken to reduce the nuisance due to emission from joss paper burners and air treatment facility will be provided to further reduce possible nuisance caused by the burning of joss paper, thus no adverse impact is expected.

3.14 Tai Tam Road and Cape Collinson Road are the major access roads to the subject site. The number of vehicles accessing the area is limited during normal days. The road traffic condition will be very much similar to the existing condition when the new crematorium comes into operation.

3.15 There is no major industrial emission within 500m of the new crematorium. No adverse cumulative air quality impact from industrial emissions on the new crematorium is expected.

Noise

3.16 During the operation of the new crematorium, the traffic will be similar to the existing condition. The road traffic noise impact on the nearby NSRs would be minimal.

3.17 As equipment and E&M installations will be properly housed with acoustic enclosure within the crematorium building, noise impact is not expected.

Water Quality

3.18 Sewage generated from sanitary facilities during daily operation of the new crematorium will be connected to nearby foul sewer and no adverse impact on water quality is expected.

Waste Management

3.19 Particulate matters and other non-combustible residues generated from cremation will be properly handled and disposed of in accordance with current practice. General refuse will arise from visitors and staff at the crematorium. The waste will be stored in lidded refuse bins and disposed of at landfill. Given the small quantity of waste to be handled and disposed of, it is not expected to cause any environmental concerns.

Landscape and Visual

3.20 The landscaping and the building would be well thought-out of a given pleasant visual environment and a calm and comfortable atmosphere to the funeral participants. Soft landscaping will be provided to the existing body cremator area after demolition. In view of the distant location of the VSR and the land profile, the impact of the development on VSRs will be minimal.

Hazard to Life

3.21 The schedule of accommodation for the new crematorium includes the provision of Dangerous Goods (DG) stores for each type of DGs (Cat. 2, 4 and 5). There would be an underground fuel tank of an estimated capacity of 50,000 Litres as the storage of light diesel fuel, a daily diesel fuel tank of 1,450 Litres capacity and a fuel pump for transferring the diesel from the underground fuel tank to the daily fuel tank. In addition, there will be a 1,000 Litres fuel tank for one combined FSI and non-FSI emergency generator.

3.22 In accordance with the relevant statutory requirements, the diesel fuel will be properly handled so as to avoid leakage of fuel into nearby drains as well as to prevent fire hazard. It is therefore anticipated

that the use and storage of diesel will not cause adverse environmental impacts and hazard concern.

3.23 A water treatment works is located at about 250m to the west of the subject site. With reference to "2007 Potentially Hazardous Installations (PHI) Register" issued by Housing, Planning and Lands Bureau in June 2007, this water treatment works is not classified as PHI. It is expected that operation of water treatment works would not cause adverse hazard concern on the proposed project.

Ecology

3.24 Ecological impact is not expected during the operation phase.

Cultural Heritage

3.25 The impact on cultural heritage is not expected during the operation phase.

4 MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

4.1 The project site is the site of the existing Cape Collinson Crematorium at Cape Collinson Road, Eastern District. It is surrounded by Tai Tam Country Park and Shek O Country Park, and located close to Cape Collinson Buddhist Cemetery, Cape Collinson Muslim Cemetery and Sai Wan War Cemetery. Domestic premises are mainly located alongside Fei Tsui Road, Wan Tsui Road and Lin Shing Road to the north of the project site.

5 ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED IN THE DESIGN AND ANY FURTHER ENVIRONMENTAL IMPLICATIONS

Air Quality

5.1 Before the demolition of the building, Asbestos Investigation Report (AIR) will be prepared. If asbestos is detected, Asbestos Abatement Plan (AAP) will be provided. Registered asbestos consultant and contractor will be employed for the supervision and the removal of asbestos works so that asbestos containing material (ACM) removal is conducted as planned with no dispersion of asbestos during demolition.

5.2 During the demolition and construction stage, dust control measures will be implemented. Reference will be made to the Dust Control Requirements under Air Pollution Control (Construction Dust) Regulation.

5.3 The design and operation of the new crematorium will follow the measures set out in the Guidance

Note on the Best Practicable Means for Incinerators (Crematoria) (BPM 12/2 (06)), which provide guidelines for the design of cremators as follows:

- All cremators will be fitted with a secondary combustion zone to ensure complete combustion.
- The gases will be held at 850°C for a minimum (at all times) of 2 seconds in the secondary combustion zone.
- The concentration of oxygen at the outlet of the secondary combustion zone should not be less than 6% by volume, if measured on a wet basis, or an average of 6% by volume with a minimum of 3% by volume if measured dry.
- Coffins should not be introduced to the cremators unless the secondary combustion zone temperature exceeds 850°C.
- Odour control measures will be installed as necessary.

5.4 In addition, the BPM 12/2 (06) specifies the concentration limits of emissions from the cremation process as shown in Table 5.1 below. In order to ameliorate the potential air quality impact associated with the operation of the Project, the new crematorium would be designed in compliance with BPM 12/2 (06).

Table 5.1 Emission Limits of Air Pollutants

Parameters	Emission Limits
Particulate matter	40 mg/m^3
Hydrogen chloride (excluding particulate matter)	30 mg/m^3
Carbon monoxide	100 mg/m^3 (60 minute average)
Organic compounds (excluding particulate matter and expressed as total carbon)	20 mg/m^3
Dioxins	0.1 ng I-TEQ/m^3

5.5 The new crematorium will be operated in accordance with the BPM 12/2 (06). The operation procedures would incorporate continual monitors and controls so that the cremation process is being controlled properly. Chimney flue ductwork would be cleaned regularly to prevent accumulation of deposits. The removal of ash and non-combustible residues would be undertaken carefully so as to prevent dust emissions. Cremated remains would be moved and stored in the individual robust plastic bags put inside cloth bags for collection by the bereaved families.

Noise

5.6 Noise control measures including the scheduling of works, the siting of facilities, the selection of quiet equipment and the use of acoustic panels and enclosures, will be implemented as far as practicable to meet the noise criteria.

5.7 In general, good site practice and noise management can considerably reduce the impact of the construction site activities on nearby NSRs. Such measures will be incorporated into the Contract Specifications.

5.8 Necessary Construction Noise Permit (CNP) will be applied before conducting piling works, if any, or using powered mechanical equipment at designated time.

Water Quality

5.9 Wastewater generated from construction activities and surface runoff from the construction site during raining are the major water pollution sources during the construction stage. The wastewater and surface runoff will be properly collected and treated. Sewage generated from the construction workers will be collected and treated. Reference will be made to the Practice Note ProPECC 1/94. Discharge will comply with the conditions stipulated in the Effluent Discharge License.

Land Contamination

5.10 Contamination Assessment Plan (CAP) will be prepared. Depending on the findings of CAP, Contamination Assessment Report (CAR) and Remediation Action Plan (RAP) will then be prepared if necessary. If contaminated land is found, the contaminated soil will be removed, handled and treated in accordance with the CAR and RAP. Impact on the surrounding environment is not expected.

5.11 The underground fuel tank for the new crematorium will be contained in a concrete chamber surrounded with sand to avoid direct contact of the fuel tank with soil.

Waste Management

5.12 Good waste management practices including avoiding, minimizing, reusing and recycling will be adopted to reduce waste generation during construction stage. In addition, on-site sorting of demolition debris will be carried out. Scrap metals or abandoned equipment will be recycled if practical.

5.13 General refuse will be generated during the operation of the new crematorium. It will be contained in bins with lids to avoid the emission of odour, windblown litter, vermin and visual impact. Chemical waste will be handled in accordance with the *Waste Disposal (Chemical Waste) (General) Regulation* and the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.*

Landscape and Visual

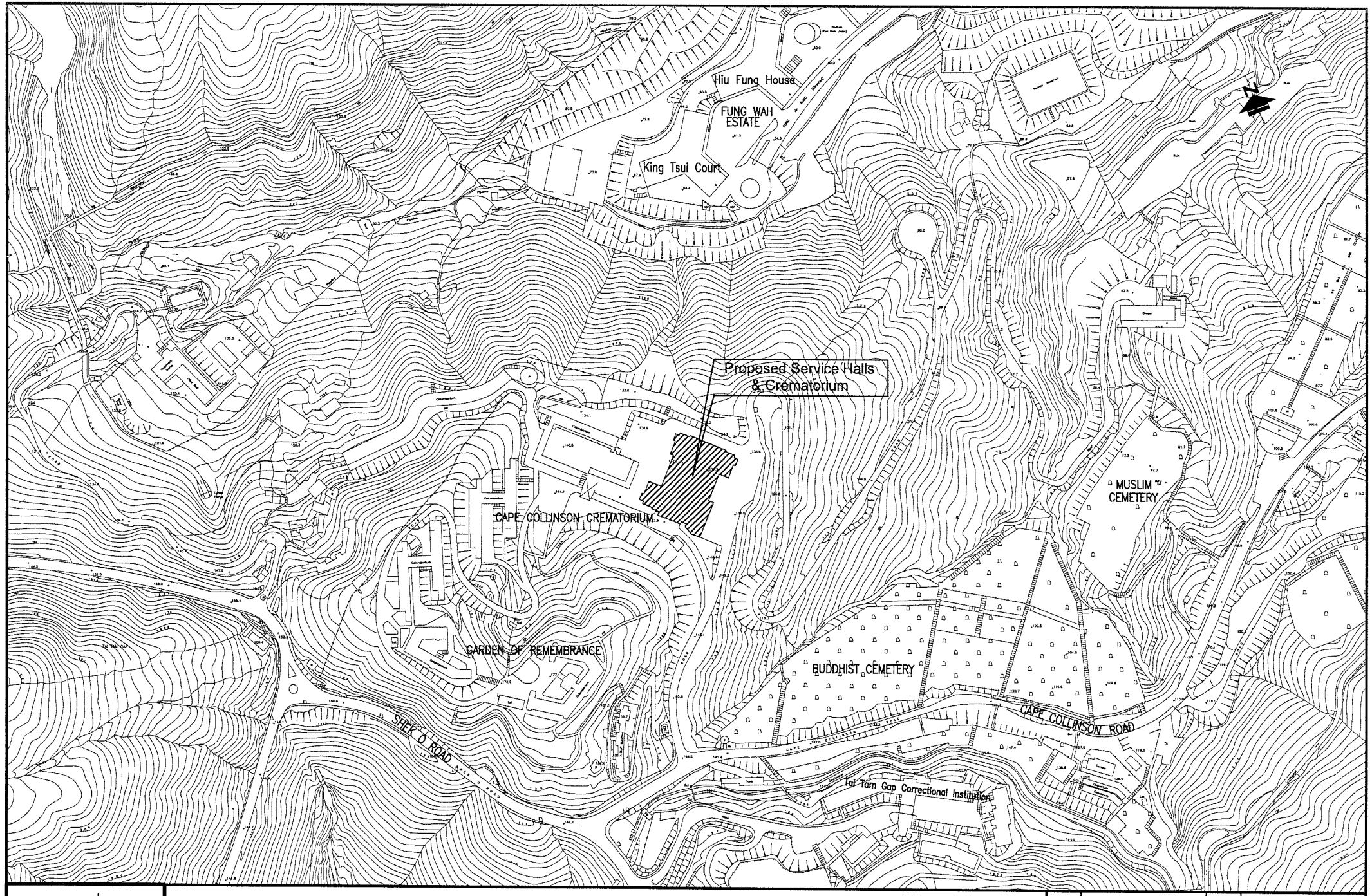
5.14 The design of the new crematorium should regard of preserving and enhancing the greenery effect of the site by protecting the existing trees and planting new trees. Overall landscape effects on new crematorium building should be collaborated with the existing landscape quality to minimize possible visual intrusion to adjacent surroundings.

Ecology

5.15 Should any species with conservation value be found at the site, appropriate mitigation measures such as transplanting or compensatory planning will be proposed.

6 USE OF PREVIOUSLY APPROVED EIA REPORTS

6.1 No relevant previously approved EIA reports are identified.



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PHASED REPROVISIONING OF CAPE COLLINSON CREMATORIUM

LOCATION PLAN

SCALE	1 : 3000 A4	DATE	NOV 07
CHECK	DCFL	DRAWN	LLMC
JOB No.	60028568	FIGURE No.	1.1
		REV	–

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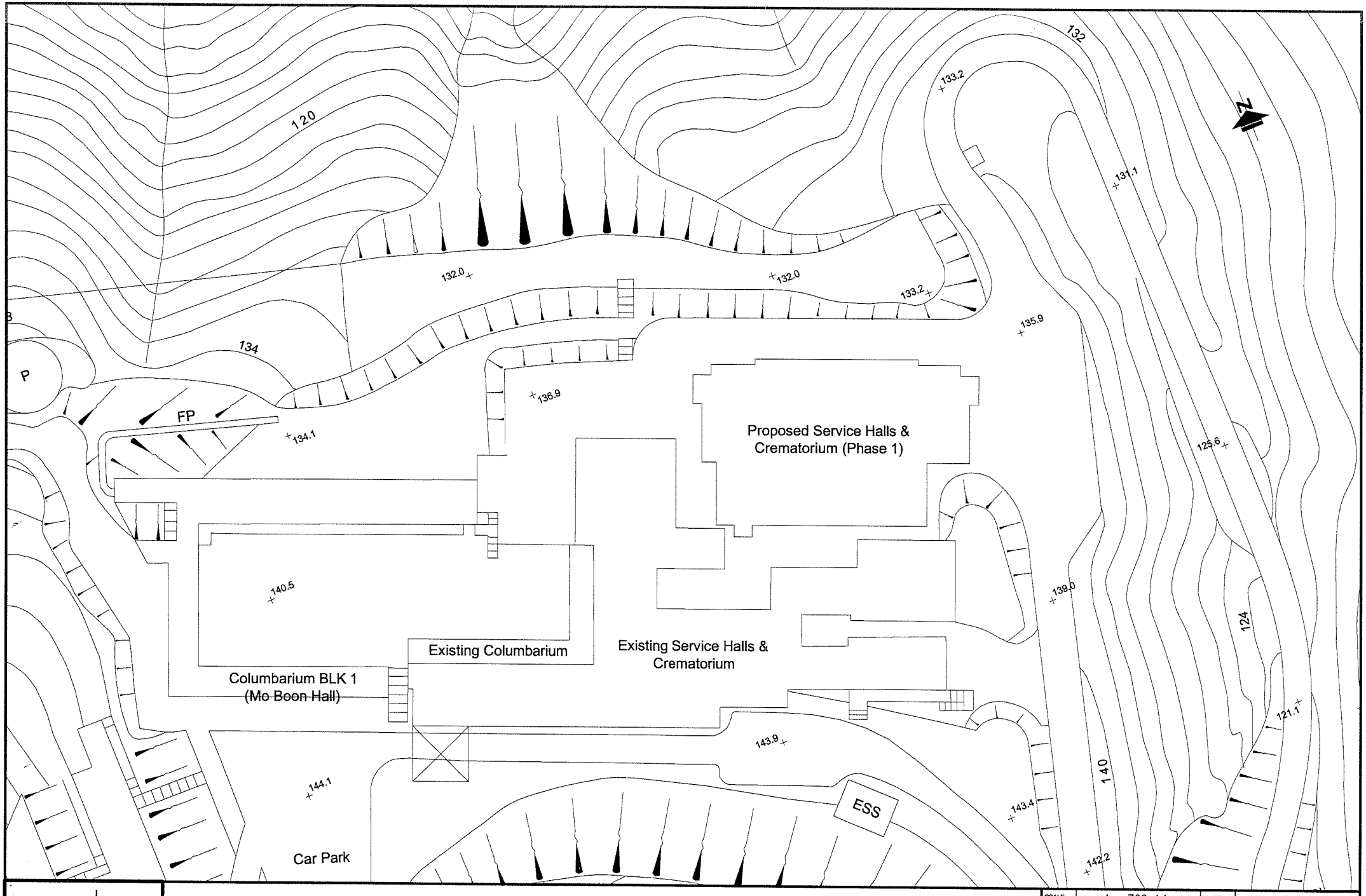

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PHASED REPROVISIONING OF CAPE COLLINSON CREMATORIUM

BLOCK PLAN (PHASE 1)

SCALE	1 : 700 A4	DATE	NOV 07
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		REV	–

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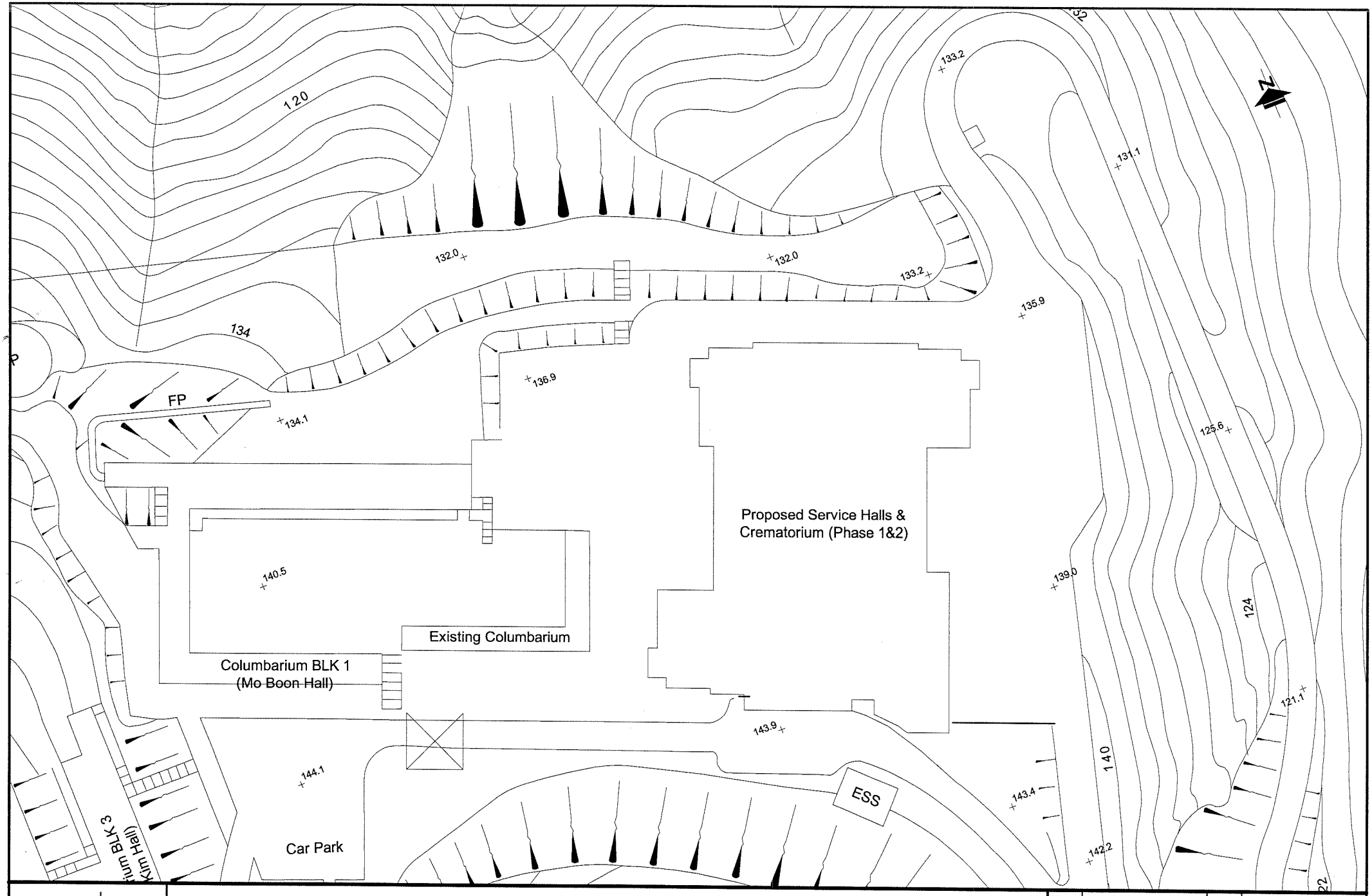

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PHASED REPROVISIONING OF CAPE COLLINSON CREMATORIUM

BLOCK PLAN (PHASE 1 AND PHASE 2)

SCALE	1 : 700 A4	DATE	NOV 07
CHECK	DCFL	DRAWN	LLMC
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		REV	–

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