Construction Site Environmental Manual for Public Works

BUILDING

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The Hong Kong Construction Association (HKCA) has published a series of environmental publications over the years in response to industry trends and information of interest to the industry. These publications include:

- Best Practice Guide for Environmental Protection on Construction Sites
- Practical Guide for Carbon Reduction at Construction Sites – Temporary Works
- Construction Innovative Environmental Practices
- Environmental Toolbox Training Kit

In order to unite these materials as a useful and practical guide to help the industry to deliver construction projects in a more environmentally friendly way, HKCA has commissioned AECOM Asia Co., Ltd. to compile the “Construction Site Environment Manual” (the Manual) to meet our expectations.

The Manual serves a practical guide for the construction industry to manage key areas of environmental protection at different types of public works sites, such as

- Civil
- Building
- Foundation
- Alteration & Additions/Demolition
- Electrical & Mechanical

The Manual provides construction personnel with good practice suggestions and a framework for managing environmental issues at all stages of construction, from contract award to completion of the project defect liability period.

Acknowledgements

The preparation of the Manual has been placed under the stewardship of HKCA Environmental Committee.

The HKCA Environmental Committee would like to record our acknowledgements and thanks to the following Construction Site Environmental Manual Task Group Members:

- Stephen Yim
- Eddie Tse
- Ben Ho
- Tony Yam
- Brian Kam

Preface

The Hong Kong Construction Association (HKCA) have always been committed to the goal of sustainable construction. We, the Environmental Committee of HKCA, have been looking at the environmental challenges facing our industry and how HKCA members can work together to develop practical solutions to address a wide range of environmental issues and concerns.

To help the industry deliver construction projects in a greener way, we commissioned AECOM Asia Co., Ltd. to develop this "Construction Site Environment Manual" (the Manual). We take into account that target users of the Manual will be from different stakeholders in the construction industry, such as government authorities, developers, designers, architects, engineers, contractors and subcontractors. The Manual provides them with a framework for managing environmental issues in all stages of construction, from contract award to completion of the project's defect liability period.

The Manual provides practical guidance for the construction industry to manage key areas of environmental protection at different types of public works sites. It also gives an analysis of local statutory provisions and contractual requirements and links environmental management responsibilities with the organizational requirements under the Development Bureau's Technical Circular (Works) No. 19/2005 for the provision of on-site environmental personnel and their training needs.

Lastly, but by no means least, we would like to thank the Environmental Protection Department for their wholehearted support and expert advice on both the genesis and the particulars of the Manual. We shall jointly together with all our many friends across the construction industry strike to continuous improvement on environmental performance on construction sites all over Hong Kong.

HKCA Environmental Committee
October 2022

Application of Environmental related Licence / Permit

Application for an Environmental Permit under the EIA Ordinance (Cap. 499)

Under the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499), a person who wishes to have constructed, construct, or operate a **designated project** listed in Part I of Schedule 2 or to decommission a designated project listed in Part II of Schedule 2 should submit an application of an **environmental permit** in the prescribed form to the Director and pay the prescribed fee.

Based on the changes of construction, Application of **Further Environmental Permit** and **Variation of an Environmental Permit** should also be considered by **Permit Holder** or Contractor. Relevant information can be found in the following website:

https://www.epd.gov.hk/eia/english/guid/ordinance/guide7_4-8.html

The processing time required for application of environmental permits is summarised below:

Application under EIAO	**Statutory Time Limit (days)***
Environmental Permit	30
Further Environmental Permit	30
Variation of an Environmental Permit	30

The information is also available online at:

https://www.epd.gov.hk/eia/operation/english/appendix11_5.html

*Only counts on the Authority's response time but excluding the time for preparing supporting documents (e.g. Env Review Report, if required) for the application.

Construction Noise Permit

Noise Control Ordinance (Cap. 400) provides statutory control to restrict and reduce specific sources of environmental noise. The Contractor should apply the **Construction Noise Permit** for:

- Undertaking the construction works during the **restricted hour** that is between 7p.m. and 7a.m. or at any time on a general holiday (including Sunday).
- During the restricted hours in **Designated Areas**, the use of **specified powered mechanical equipment** (for example, hand-held breakers and dump truck) and/or the carrying out of the prescribed construction activities (for example, erection or dismantling of formwork and hammering) is subject to more stringent control.
- The carrying out of **percussive piling** is prohibited between 7 p.m. and 7 a.m. and on general holiday (including Sunday). A valid Construction Noise Permit issued by the Environmental Protection Department is required for the carrying out of percussive piling during the permitted hours. The permitted hours generally fall into the period of 7 a.m. to 7 p.m. on weekdays not being on a general holiday (including Sunday).

The requirements and procedure for application of permit for Construction Noise Permit can be found in the following link:
https://www.epd.gov.hk/epd/english/application_for_licences/guidance/application_maincontent36.html

It is a statutory requirement for the Authority to notify applicants of the outcome of the applications within 28 days after receipt of the applications. However, EPD aims to complete processing the applications within 14 days.

[Remarks: In general, only CNP applications of good quality meeting all criteria of relevant checklist(s) may be processed within 14 days. However, for complicated case necessitating assessments involving a few projects or insufficient information provided by the applicant, the processing time would take longer or leading to the refusal of issuing a CNP.]

The information regarding the timeframe for EPD to response to the CNP applicant after receiving the CNP application is extracted online from:
https://www.epd.gov.hk/epd/english/application_for_licences/guidance/cnp.html

Licence under the Water Pollution Control Ordinance (Cap. 358)

The Water Pollution Control Ordinance (WPCO) (Cap.358) provides for declaration of Water Control Zones (WCZs) to cover the whole of Hong Kong. Discharge of all effluents except domestic sewage into **communal sewers** and **unpolluted water** into stormwater drains, river courses and water bodies are subject to control under WPCO and should be covered by a licence which specifies the requirements of the effluent discharge.

The requirements and procedure for application of Wastewater Discharge Licence can be found in the following link:

https://www.epd.gov.hk/epd/english/application_for_licences/guidance/aw_331.html

The applicants should check that all essential supporting information (such as copies of Business Registration Certificate, estimation of discharge flow rate, location of the discharge points, etc) to be submitted along their application. The applicants are advised to plan ahead their applications and reserve sufficient time for application processing and settling of payment. The Authority may carry out site inspection to verify the set-up of Contractor's wastewater treatment facilities and request the Contractor to provide supplementary information. In addition, applications for making a discharge into the waters of Hong Kong requires the applicant to publish a notice to publicly notify the application in an English and a Chinese newspaper. at his own expense. The only exceptions are:

- the application for a licence to discharge domestic sewage from a separate household; and
- the application for renewal of a licence in respect of a discharge from the applicant's establishment that consumes 10 cubic meters or less of water a day and the rate of flow of the discharge applied for is not greater than that.

https://www.epd.gov.hk/epd/english/environmentinhk/water/guide_ref/guide_wpc_wpco_4.html

The application form for the licence can be found in the EPD website (EPD117 Form A - Application for a licence/Application for renewal /variation of a licence):

https://www.epd.gov.hk/epd/english/application_for_licences/applic_froms/forms.html

Permit under the Dumping at Sea Ordinance (DASO) (Cap. 466)

The Dumping at Sea Ordinance (DASO) (Cap.466) controls the disposal and dumping of substances and articles from vessels, aircraft, and marine structures in the sea and under the seabed and the related loading operations. All these operations would require a permit to be issued by the Director of Environmental Protection as the Authority under the DASO.

Before an application of a **marine dumping permit** is made, the project proponent should have fulfilled the requirements stipulated in **"Environment, Transport and Works Bureau Technical Circular (Works) No. 34/2002"** as applicable or "Buildings Department Practice Note for Authorized Persons and Registered Structural Engineers No.252" (re-issued as ADV-21) regarding dredged sediments testing and allocation of dumping capacity. Usually, the approved **Sediment Quality Report (SQR)** and **CEDD-MFC**'s allocation should be ready before applying marine dumping permit.

The Contractor should review the particular specification which usually has a clause which should state the expiry date of the reliability period of the current SQR and that it is the contractor's responsibility for carrying out, at his own expense, any work required to extend the reliability period of the SQR should he fail to apply for a dumping permit before the expiry date. Director of Environmental Protection controls dumping at sea by means of **DASO permits** which are issued to contractors or other parties responsible for the disposal of dredged/excavated sediment. The contractor who will be undertaking the works must make a formal application to DEP for a dumping permit, and if the permit is granted, it will be the contractor's responsibility to ensure that the permit conditions are met to DEP's satisfaction.

Currently, all dumping vessels have to be approved in a marine dumping permit issued under the DASO. Each of the vessels has to be installed with an automatic recording equipment, namely the **Front End Mobile Unit (FEMU)**, which is a key component of the **Real Time Tracking & Monitoring of Vessel (RTTMV) System** of EPD. The FEMU transmits self-monitoring data direct from the barge at sea to the Control Centre at EPD through GPRS mobile communication network.

The requirements and procedure for application of permit for DASO can be found in the following link:
https://www.epd.gov.hk/epd/english/application_for_licences/guidance/application_maincontent3 5 .html

With proper and sufficient information received, EPD aims to complete processing the applications within 18 days after receiving the application of marine dumping permits.

Licence for Specified Process (SP Licence) under Air Pollution Control Ordinance (APCO) (Cap. 311)

Industrial activities which involve certain polluting industrial processes known as **specified processes.** Any person who wants to conduct the specified processes is required to obtain a SP licence from EPD. Application for a new licence should be made in **Form 1**, pursuant to Section 14 of the Air Pollution Control Ordinance (Cap. 311). Below table shows 31 types of works which required a SP licence, but normally, only cement works, mineral works and tar and bitumen works are related to the construction industry.

1 Acrylates Works	2 Aluminium Works
3 Cement Works	4 Ceramic Works
5 Chlorine Works	6 Copper Works
7 Electricity Works	8 Gas works
9 Iron and Steel Works	10 Metal Recovery Works
11 Mineral Works	12 Incinerators
13 Petrochemical Works	14 Sulphuric Acid Works
15 Tar and Bitumen Works	16 Frit Works
17 Lead Works	18 Amines Works
19 Asbestos Works	20 Chemical Incineration Works
21 Hydrochloric Acid Works	22 Hydrogen Cyanide Works
23 Sulphide Works	24 Pathological Waste Incinerators
25 Organic Chemical Works	26 Petroleum Works
27 Zinc Galvanising Works	28 Rendering Works
29 Non-ferrous Metallurgical Works	30 Glass Works
31 Paint Works	

The Contractor may need to engage an environmental consultant to prepare an **Air Pollution Control Plan (APCP)** which would always involve air quality modelling to review/predict the air quality impacts on the nearby air quality sensitive receivers. The Contractor would also need to submit a block plan and schematic diagrams as follows: :

a. A block plan, drawn to a scale of 1:500 prepared by an authorized person, showing the buildings and topography surrounding the premises where the specified process is to be conducted and the location of all emission points and their corresponding numbers.
b. Schematic diagrams of process flow prepared by a qualified engineer/registered professional engineer, showing the flow of materials, including raw materials, materials in process of manufacture, manufactured materials, by-products, and waste materials. All emission points and processes/equipment, including air pollution control equipment, associated with each emission point, must be identified, and labelled with consistent reference numbers.

Licence for Specified Process (SP Licence) under Air Pollution Control Ordinance (APCO) (Cap. 311)

The preparation of application documents including APCP usually takes about 60 days. After the submission of application documents, it will normally spend 2 to 3 months to respond EPD's comments. After submitting the finalised version of the required documents, EPD will send the draft terms and conditions of the SP licence to the Contractor for comment. If the Contractor accepts the draft terms and conditions of the SP licence, EPD will arrange a site visit to inspect the commissioning trial of the specified process.

The application may be required to be publicly notified at the expense of the applicant in English and Chinese newspapers. The Authority may, not earlier than 40 days after the last notice is published in the newspaper, either grant or refuse to grant the licence.

Normally, the whole application process takes at least 6 months, depending on the quality of the APCP and whether all the required information is submitted on time.

Approval to be obtained under the Air Pollution Control (Furnaces, Ovens and Chimneys) (Installation and Alteration) Regulations

Under the Air Pollution Control (Furnaces, Ovens and Chimneys)(Installation and Alteration) Regulations (Cap. 311A), any person who wishes to install , alter or modify any furnace or chimney exceeding a certain fuel consumption needs to submit an **Application for Approval of Installation/Alteration of Furnace/Oven/Chimney** to EPD to get prior approval. The Contractor should review and strictly follow the requirements listed in the Notes to Applicants of the application form the Contractor should note that all plans, drawings, block plan, diagrams or specifications submitted with or in relation to the application should be provided and prepared by a qualified engineer or an authorized person and in appropriate scale.

The Contractor must submit plans to the Authority for approval not less than 28 days prior to the commencement of work. The Authority may refuse to grant approval if the Authority is not satisfied that the furnace, oven or chimney can be operated without:

a. causing or contributing to the existence or imminence of air pollution; or
b. emitting air pollutant due to improper design, maintenance, or operation.

The timeframe for the whole application process varies, depending on the quality and whether all the required information is submitted on time, EPD aims to complete processing the application within 16 days for responding/issuing approval on the specifications and plans for installation or alteration of furnaces or chimneys. However, the Contractor should be aware that if additional information is requested by the authority or if there are comments to be addressed by the Contractor, the whole application process could take longer.

Application Forms for Environmental Related Licence of Permit

All application forms can be found in the following website:
https://www.epd.gov.hk/epd/english/application_for_licences/applic_froms/forms.html
For more information on the timeframe for the application of licence and permit, please use the below hyperlink to access:
https://www.epd.gov.hk/epd/english/about_epd/perf_pledge/perf_pledge.html

Environmental related Registration

Air Pollution Control (Construction Dust) Regulation (Cap.311R)

According to Section 3(1) of The Air Pollution Control (Construction Dust) Regulation (Cap.311R), the contractor responsible for a construction site where any **notifiable work** is proposed to be carried out should give notice to the Authority of the proposal to carry out the work.

Under the regulation, notifiable work includes:

a. site formation;
b. reclamation;
c. demolition of a building;
d. work carried out in any part of a tunnel that is within 100m of any exit to the open air;
e. construction of the foundation of a building;
f. construction of the superstructure of a building; or
g. road construction work.

The related application (**Form NA**) can be found in the following website:
https://www.epd.gov.hk/epd/sites/default/files/epd/english/application_for_licences/applic_froms/files/cdr-e-na.pdf

For giving notice to EPD of the proposal to carry out the notifiable work, the notification must be made before the proposed work is to be commenced. If there is any proposed change to the particulars of the submitted Form NA, the Contractor should notify Environmental Protection Department in Form NB before the proposed change takes effect.

The related application (**Form NB**) can be found in the following website:
https://www.epd.gov.hk/epd/sites/default/files/epd/english/application_for_licences/applic_froms/files/cdr-e-nb.pdf
The application and notification process will be deemed successful and completed once Contractor obtained acknowledgement receipt from one of the EPD's Customer Service Counters.

Billing Account for Construction Waste Disposal

Main contractor who undertakes construction work under a contract with value of $1 million or above is required to open a **billing account** solely for the contract. Application should be made within 21 days after the contract is awarded. Failing this will be an offence under the law.

For construction work under a contract with value less than $1 million, such as minor construction or renovation work, any person such as the owner of the premises where the construction work takes place or his/her contractor can open a billing account; the account can also be used for contracts each with value less than $1 million. The premises owner concerned may also engage a contractor with a valid billing account to make arrangement for disposal of construction waste.

Relevant information of the application for the billing account and Construction Waste Disposal Charging Scheme (Charging Scheme) can be found in the following link:
https://www.epd.gov.hk/epd/misc/cdm/scheme.htm#c

Once EPD received Contractor's application for opening a billing account, it will usually take 2-4 weeks to obtain the billing account number and **disposal CHITs**. The deposit for the disposal of construction waste generated from a contract with a value of $1 million or above is charged at a minimum of $15,000 for 200 chits. For issuance of more than 200 Chits, the deposit is $75 per Chit. For a contract with a value of less than $1 million or other general uses, a deposit of $300 for each chit is required.

For intended disposal transportation of inert construction waste by vessels to the public fill bank **Vessel CHIT** application should be separately made to CEDD and c.c. to EPD.

The vessel CHIT application form can be downloaded by using the following hyperlink:
https://www.cedd.gov.hk/filemanager/eng/content_640/form7.pdf

Chemical Waste Producer Registration

The Waste Disposal (Chemical Waste) (General) Regulation (Cap.354C) controls all **chemical waste** from non-household sources, from the point of production to point of disposal. The controls are on chemical waste but NOT activities. All **chemical waste producers** are required to be registered with EPD, and to provide suitable packaging, proper labelling and storage of their chemical waste. Only **licenced waste collectors** should transport chemical waste and any disposal which includes treatment, re-processing and recycling of chemical wastes should be carried out at **licenced disposal facilities**. The requirements are summarised as follow:

a. Production
b. Packaging, Labelling, Storage*
c. Collection and Transportation#
d. Disposal

* For code of practice on setup of storage of chemical wastes on site, the Contractor should refer to EPD's Code of Practice on The Packaging, Labelling and Storage of Chemical waste which is available online at:
https://www.epd.gov.hk/epd/english/environmentinhk/waste/guide_ref/guide_cwc_sub3.html

For the duties of Contractor as chemical waste producers under collection of chemical waste and the trip ticket system, please refer to section B.5 of EPD's publication - A Guide to The Chemical Waste Control Scheme which is available online at:
https://www.epd.gov.hk/epd/english/environmentinhk/waste/guide_ref/guide_cwc_sub1.html

Relevant information for the Chemical Waste Producer Registration can be found in following website:
https://www.epd.gov.hk/epd/english/application_for_licences/guidance/aw_341.html
EPD aims to complete the registration of chemical waste producers in 30 days after receiving completed application form with the required document.

Environmental Personnel

Environmental Officer

The Contractor should assign a person as the **Environmental Officer** for overseeing all environmental matters of the Works. The minimum qualification of duties of the Environmental Officer are shown in Appendix C of the Environmental, Transport and Works Bureau Technical Circular (Works) No.19/2005 **(https://www.devb.gov.hk/filemanager/technicalcirculars/en/upload/19/1/C-2005-19-0-1.pdf).**

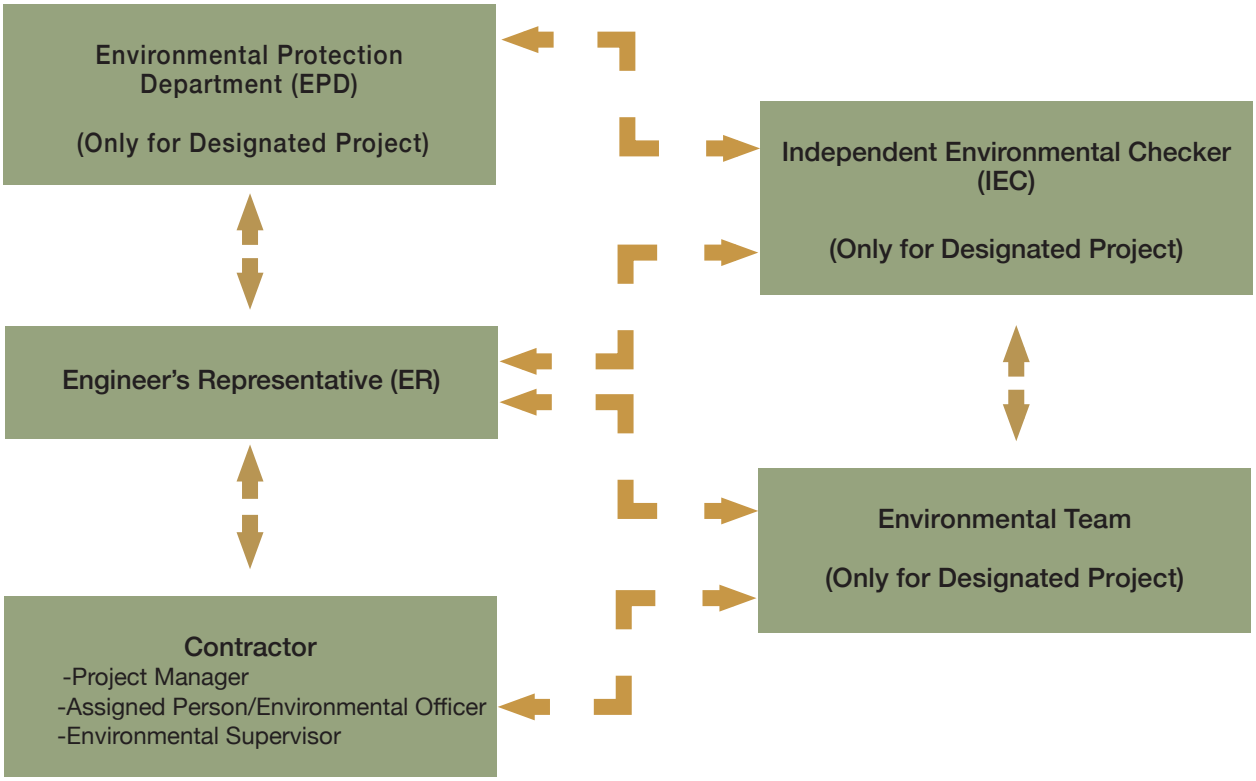
Environmental Supervisor

In addition, the Contractor should appoint at least one additional site staff as the **Environmental Supervisor** to assist the Environmental Officer for the inspection, supervision, and monitoring of the environmental performance of the Works.

Where the number of workers employed on the Works, whether in the employment of the Contractor or his sub-contractors, exceeds 50 in aggregate, the number of Environmental Supervisor shall be increased by one for every additional 50 persons or part thereof.

The requirements and the duties of the Environmental Supervisor are shown in Appendix C of the Environmental, Transport and Works Bureau Technical Circular (Works) No.19/2005 (https://www.devb.gov.hk/filemanager/technicalcirculars/en/upload/19/1/C-2005-19-0-1.pdf).

Organization



Environmental Monitoring Manager

In some Design-Build-Operate (DBO) projects, the Contractor is required to appoint an **Environmental Monitoring Manager** as the leader of environmental officer and environmental supervisor for overseeing the environmental issue for the Works and Operation of the Facility.

The Environmental Monitoring Manager should have a Bachelor degree or Master degree, or equivalent, in a relevant science or engineering subject; or corporate member of the Hong Kong Institution of Engineers, or the Chartered Institute of Water and Environmental Management, or the Royal Society of Chemistry, or classification as a Chartered Environmentalist, or an institution of equivalent.

The Environmental Monitoring Manager should have not less than 5 years of experience in environmental monitoring in Hong Kong.

Site Assessment / Site Reconnaissance

If the construction work area contains any potential **land contamination** source, relevant mitigation measures will usually be stated in the particular specification (PS). The Contractor should check and review the PS and strictly follow the stated mitigation measures.

The Contractor should check whether a **Contamination Assessment Plan (CAP), Contamination Assessment Report (CAR) and a Remediation Action Plan (RAP)** are available in the particular specification. For some contracts, the Contractor is required to prepare the CAP, CAR and RAP , whereby sufficient time should be allowed in the works programme for the related works on site **investigation (S.I.)**, laboratory testing and the authority's approval. In general, the construction work area should have the land contamination issue resolved before proceeding to other general construction activities.

Relevant information can be found in Section 10.5 of the Construction Best Practice Guide which can be accessed via the following hyperlink:

Best Practice Guide for Environmental Protection on Construction Sites (2013)

During ground investigation, when sediment other than alluvial and completely decomposed granite (CDG)/ completely decomposed turf (CDT) materials was discovered in the marine environment, freshwater environment (such as freshwater fishpond) or land area, the Contractor should notify the project proponent, review the contract document, and decide the handling arrangement. If it is confirmed that the Contractor is responsible for handling of the **sediment**, the Contractor should review the Contract's particular specification and decide whether the Contractor needs to engage a sediment treatment specialist. In general, the subsequent process usually involves the preparation of method statements to provide details such as location & anticipated volume of excavated sediment; sampling, testing, handling method, QA/QC procedures and pilot scale trial method etc. This might take up over 1 month for sourcing of sediment specialist, preparation and submission of method statement and project proponent's review and approval. The Contractor should consider the following factors when estimating the time required for complete sediment handling:

- Actual sampling time varied mainly due to different programme of GI works in different project and site access to works area where sediment occurred.
- If sediment treatment is required, completion of pilot scale trial might take up to over 1 month including sampling, treatment, curing, testing, and reporting; and for each batch of full-scale sediment sampling, treatment, curing of treated sediment, laboratory testing and reporting, it might take up to over 1 month for completion.
- If dumping of marine sediment is required, reference can be made to the Technical Circular 34/2002 (i.e. Management of Dredged/Excavated Sediment), which set out the procedure for seeking approval to dredge/excavate sediment.
- Sufficient time should be allowed in the works programme for sediment sampling & testing, laboratory testing and the authorities' approval of submissions & dumping site allocations. Under no circumstance, dredging/ excavation of sediment could commence before the above procedure be satisfactorily gone through.

Before commencement of alteration and additional works and/or demolition works, the Contractor should review the particular specification whether the Contractor is required to employ a **registered asbestos consultant (RAC)** to carry out investigation for all **asbestos containing materials (ACM)** in the premises.

Based on the findings of the **asbestos investigation report**, if ACMs were identified, the Contractor should check whether it is the Contractor's responsibility to employ a registered asbestos consultant to prepare an **asbestos abatement plan** and/or directly employ a **registered asbestos contractor** to carry out the removal of the asbestos containing materials in accordance with relevant regulations and the asbestos abatement plan if required. The registered asbestos contractor should give a written notice to the EPD and Labour Department (LD) not less than 28 days prior to the commencement of the work. The concerned construction work area should be certified by the respective registered asbestos professional of completed ACM removal before proceeding to other general construction activities.

Asbestos waste is a chemical waste. It should not be mixed with household waste, nor delivered to the refuse collection points nor public dumping areas. The registered asbestos contractor should properly store the asbestos waste and arrange a **licenced collector** to remove the asbestos waste in accordance with the Waste Disposal (Chemical Waste)(General) Regulation, Cap. 354C.

Relevant information of the Asbestos Control can be found in the following website:
https://www.epd.gov.hk/epd/english/environmentinhk/air/asbestos/asbestos.html

Ecology

The primary responsibility for ecological survey/assessment usually rests with project proponent during the EIA process. In general, the Contractor should check the particular specification of the project whether the Contractor is required to implement measures to mitigate ecological impacts to the project.

Cultural Heritage

If the Construction works area contains the sites of unique archaeological, historical or architectural value will be considered as highly significant in EIA Report, the Contractor should follow the mitigation measures listed in the particular specification and/or relevant document such as the environmental monitoring and audit manual and the approved EIA report.

Enviromental Management Plan (EMP)

Notes to Tenders

In accordance with the Environment, Transport and Works Bureau Technical Circular (Works) No.19/2005 (ETWB TCW 19/2005), Tenderers should note the Special Conditions of Contract and the Particular Specification on "**Environmental Management**" and "**Environmental Management Plan**" for minimising nuisances and waste generation from the Works. In addition, tenderers should note that all Constructional Plant powered by diesel fuel working on this Contract must use ultra-low sulphur diesel:

Special Conditions of Tender

1. The tenderer should upon written request by the Engineer designate in accordance with the General Condition of Tender submit an **Outline EMP,** which should be the tenderer's proposal to:
    a. minimize the environmental nuisances of air, noise and wastewater pollution.
    b. minimize the generation of surplus **construction and demolition (C&D) materials,** in particular, the proposed measures to avoid/minimize the use of timber for Temporary Works construction, to effectively carry out on-site sorting of C&D materials and to minimize the generation of C&D waste from equipment/material packaging during the course of the Works.

2. The Outline EMP should be specific to the Site and used for the preparation of the Environmental Management Plan after the Contract is awarded. It should **not** form part of the Contract.

Key Special Conditions of Contract

The following clause may be added to the Special Conditions of Contract:

i. The Contractor should prepare a **draft EMP** in accordance with the Particular Specification and submit required hard copies of the draft EMP to the Architect/ Engineer for comments within **21 days** of the date of the Employer's letter of acceptance of the Tender.

ii. If the Architect/Engineer is of the opinion that the draft EMP does not meet the requirements of the Contract, he / she should request the Contractor to revise the draft EMP by notice in writing and the Contractor should revise the draft EMP and re-submit within **7 days** of the date of the notice.

iii. The Contractor should finalize the EMP within **45 days** of the date of the Employer's letter of acceptance of the Tender and submit required hard copies of the EMP, which were inserted by the contract drafter, and a soft copy in Microsoft Word format to the Architect/Engineer.

Relevant information for Special Conditions of Contract of EMP can be found in Appendix B of Technical Circular (Works) No.19/2005.

https://www.devb.gov.hk/filemanager/technicalcirculars/en/upload/19/1/C-2005-19-0-1.pdf

Particular Specification on Environmental Management

The Contractor should prepare the EMP in accordance with the Particular Specification based on the Outline EMP for implementation on the Site to reduce environmental nuisances and construction and demolition (C&D) materials arising from Works, throughout the construction period.

Practice Note for Registered Building Contractors

The Registered Contractors should take appropriate actions to minimize the impact of construction activities on the surrounding environment as stated in the Practice Note for Control of Environmental Nuisance from Construction Sites.

Relevant information can be found in Practice Note for Control of Environmental Nuisance from Construction Sites:

https://www.bd.gov.hk/doc/en/resources/codes-and-references/practice-notes-and-circular-letters/pnrc/Pnrc17.pdf

Preparation of Environmental Management Plan

The Contractor should submit the EMP for the Contract to the Architect/Engineer in accordance with the Special Condition of Contract. The EMP should be signed before submission by both the Contractor's agent and the **Environmental Officer** or **Assigned Person**. The EMP should include the following details categorized into four parts, which is:

Part A – General

1) Environmental Management Policy
2) Organizational Structure for Environmental Management
3) Duties and Responsibilities
4) Environmental Training
5) In-house Rules and Regulations
6) Committees
7) Performance Monitoring
8) Promotion
9) Review of Requirements

Part B – Environmental Nuisance Abatement

1) Air pollution abatement
2) Noise pollution abatement
3) Wastewater pollution abatement

Part C – Waste Management

1) Waste Reduction Measures
2) Waste Targets
3) On-site sorting of C&D Materials
4) Waste Flow

Part D – Record

1) Sample Proforma for Recording
2) Waste Targets
3) On-site sorting of C&D Materials
4) Waste Flow

Note:

Relevant information for EMP can be found in Section 6 of the Appendix C of Technical Circular (Works) No. 19/2005:

https://www.devb.gov.hk/filemanager/technicalcirculars/en/upload/19/1/C-2005-19-0-1.pdf

Waste Management Plan

In accordance with the Technical Circular TCW No.19/2005, waste management will normally be included in the **Environmental Management Plan** of the construction project. However, for some **designated projects** under EIAO or projects following **BEAM Plus** requirements, an individual **Waste Management Plan (WMP)** is required. Contractors should review the contract requirements before the commencement of projects.

The WMP provides an overall framework for waste management and reduction. It identifies major waste types and defines ways for waste reduction. The Contractor should review and update the WMP regularly. An appropriate waste management plan should contain:

Key types of waste to be reduced

- In general, waste that are hazardous to the environment, bulky, valuable, reusable or recyclable would obtain higher priority for reduction.

Waste reduction targets

- For each identified item, waste reduction targets such as percentage reduction and recycling rate should be set out.

Waste reduction programmes

- Actions for waste reduction should be worked out for each identified waste type in the form of waste reduction programmes, procedures and guidelines.

Waste disposal procedures

- Proper waste disposal procedures should be defined for each waste type.

Waste Management Facilities

- Provision of waste receptacles for each waste type.
- Provisions of Waste handling/ sorting area and stockpiling area.
- Provision of on-site weighbridge.

Monitoring and Audit

- Monitoring Programme should be set up to record the quantity of waste generated/ reduced/recycled/disposed as well as other performance indicators in the WMP. The performance of the WMP should be reviewed and the plan should be updated whenever necessary.
- The technical circular ETWB TCW No.19/2005 “Environmental Management on Construction Site” issued by the Government is recommended as a good reference for WMP.

Benefits of Waste Management

- Proper waste management could reduce material wastage by improper use and damage during handling and storage, and thus
  - Reduce project expenditure.
  - Reduced amount of waste costs less in waste transportation and disposal.
  - Reduced amount of waste conserves landfill space.
  - Proper waste management increases site safety, work efficiency and also increases company’s public image.

Levels of Management and Corresponding Roles on Waste Management

- Different parties and levels of management should have specific roles on waste management.
  - Client's responsibility: consider waste minimization concepts and specify waste in the brief minimization requirements for designer and contractor to follow.
  - Designer's responsibility: incorporate waste minimization in the design concept, material selection, construction method, etc.
  - Contractor's responsibility: implement waste minimization measures on-site, e.g. on-site sorting, recovery for reuse / recycle, waste flow record, etc.

Site Management Plan for Trip Ticket System (TTS)

The Contractor shall prepare a site management plan for implementation of the **TTS** for the whole Contract. The Contractor shall submit within **45 days** of the date of the Employer's letter of acceptance of the Tender the site management plan to the Architect/ Engineer/Supervising Officer/Maintenance Surveyor for approval.

The Contractor shall obtain the approval of the Architect/Engineer/Supervising Officer/ Maintenance Surveyor for the site management plan before disposing any **C&D materials** from the Site. The Contractor shall review the site management plan on a monthly basis.

The plan shall include the following details:

a) Site organization and staff duties
b) Disposal Programme
c) Site procedures
d) Surveillance
e) Recording system
f) Control Measures to track internal movement of materials
g) Video Recording System

The Contractor should inform the Truck Drivers to follow the requirements and procedures of TTS.

The review site management plan and implementation of TTS and review of non-compliance incidents and follow up actions should be included in agenda of the site safety and environmental committee meeting and site safety and environmental management committee meeting for discussing.

Recording system should be set up to ensure timely retrieval of the **CHIT/DDF** and/ or the **Transaction Record Slip** and makes it available for inspection by the Architect/ Engineer/Supervising Officer/Maintenance Surveyor or his staffs upon request or where irregularities are observed.

The Contractor shall also note that the Employer takes a very serious view of any non-compliance with the TTS requirements. Without prejudice to other regulating action which may be taken against the Contractor, the Contractor's performance in implementing the TTS will be fully reflected in the Report on the Contractor's Performance.

Relevant information can be found in Technical Circular (Works) No.6/2010 - Trip Ticket System for Disposal of Construction & Demolition Materials which can be accessed via the following hyperlink:

https://www.devb.gov.hk/filemanager/technicalcirculars/en/upload/308/1/C-2010-06-01.pdf

Site Drainage Plan

A **Site Drainage Management Plan**, covering the collection, treatment and disposal of effluent, should be incorporated as part of the Environmental Management Plan of the construction project. It should be prepared, regularly reviewed, and implemented under close supervision of qualified environmental site staff.

The following way may be adopted to establish the Site Drainage Plan:

- Minimisation of Generation of Wastewater
- Installation of Wastewater Treatment System
- Reused of treated wastewater
- Prevention of Flooding
- Management of Rainwater

Some basic environmental guidelines for the handling construction site discharges can be found in Practice Note for Professional Persons - Construction Site Drainage (Pro-PECC PN1/94):

https://www.epd.gov.hk/epd/sites/default/files/epd/english/resources_pub/publications/files/pn94_1.pdf

Relevant information for Special Conditions of Contract of Environmental Management Plan can be found in Section 7 in Best Practice Guide for Environmental Protection on Construction Sites:

Best Practice Guide for Environmental Protection on Construction Sites (2013)

Construction Site Discharge

According to ProPECC PN1/94 issued by EPD, the Contractor should follow the following practical solutions if there are any needs to discharge the stormwater drain.

Practical Solutions

- Apply a license under ***Water Pollution Control Ordinance, Cap. 358*** from the EPD before discharging effluent from construction site.
- Deploy wastewater treatment facilities on site treating wastewater to meet the conditions of **WPCO license** prior to discharging.
- Segregate domestic sewerage from construction wastewater and surface runoff. Deploy toilet facilities on site.
- Protect drainage system and discharge point to avoid blockage.
- Conduct regular self-monitoring checks to ensure the quality of the effluent discharged meet the prescribed standard.

A Licene for Construction Site Discharge

Construction site discharges are controlled under the WPCO (Cap.358) and the terms and conditions of a valid WPCO licence should be complied with. Discharge of all effluents except discharge domestic sewage into **communal sewers** and **unpolluted water** into stormwater drains, river courses and water bodies are subject to control under WPCO and should be covered by a licence which specifies the requirements of the effluent discharge. Details of application procedures, application form and time factor can be found under the topic Application of Environmental Related Licence/Permit of this Manual.

Environmental Control Equipment Setup

Environmental Control Equipment Setup

There are different types of environmental control equipment which could be setup on site to effectively mitigate or prevent potential environmental impacts to the environment. The following are examples of environmental control equipment.

Construction Dust Controls

Site Boundary, Entrance and Hoarding

Using high-pressure water for vehicle cleaning.

Using automatic wheel washing facility for vehicle cleaning.

Erecting 2.4m high for site hoarding to act as a general barrier against construction dust dispersion.

(Photo is extracted from EPD's website)

Erecting double deck hoarding for building construction work.

(Photo is extracted from EPD's website)

Road Opening / Resurfacing Work

Using impervious sheeting as dust screen.

Breaking

Dampening the breaking surface to suppress dust during breaking work.

Use of Sprinkler System for Dust Suppression

Spraying with water spray to suppress dust at waste discharge point.

Using sprinkler system to suppress dust at large construction sites.

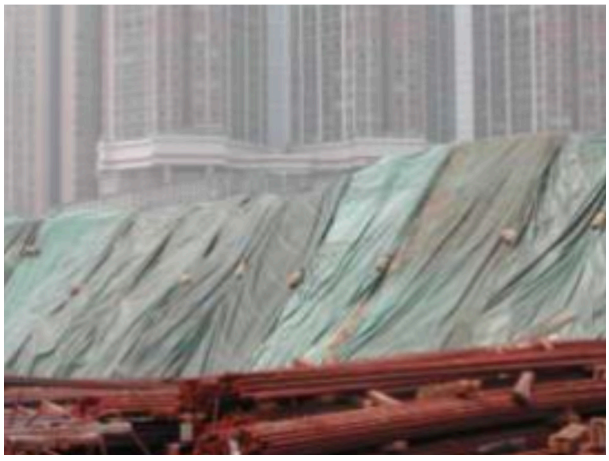
(Photo is extracted from EPD's website)

Haul road & Exposed Area

Main haul road shall be paved with concrete, bituminous materials, hardcore or metal plates, and kept clear of dusty materials.

Spraying with water regularly on the exposed area to suppress dust.

Stockpile & Exposed Slope



Covering dusty stockpile and exposed slope entirely by impervious sheeting to avoid windblown dust emission.

Soil Nailing

Spraying with water continuously and providing dust screen during drilling work.

Handling of Dusty Material

Covering dusty materials on dump truck entirely by impervious sheeting to avoid dust emission during transportation.

Cement

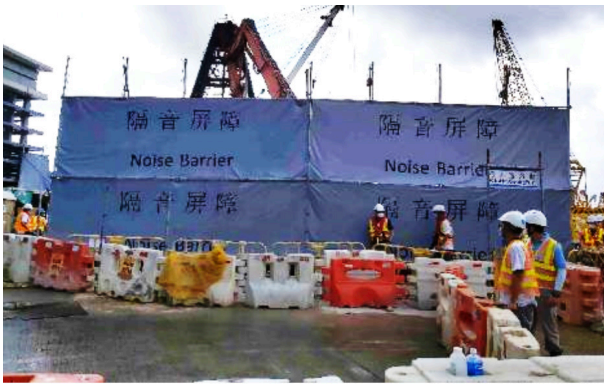
Carrying out de-bagging, batching and mixing processes for production of concrete using bagged cement in an area sheltered on the top and the 3 sides.

Covering every stock of more than 20 bags of cement entirely with impervious sheeting.

Relevant information of construction dust controls can be found in Section 4 of Best Practice Guide for Environmental Protection on Construction Sites:

Best Practice Guide for Environmental Protection on Construction Sites (2013)

Demolition

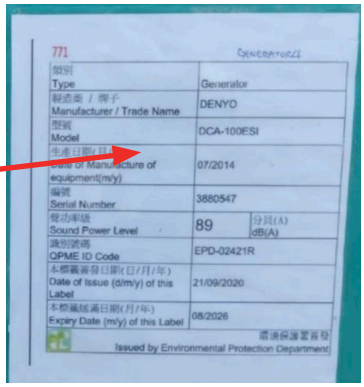


Erecting noise barriers to screen demolition activities.

Using hydraulic concrete crusher for demolition works.

Adopting hammer bracket (the bracket made of special alloy lined sound insulating material) to reduce the noise from excavator-mounted breaker.

QPME



Using QPME as far as possible.

Sample of a QPME Label

Relevant information of construction noise controls can be found in Section 6 of Best Practice Guide for Environmental Protection on Construction Sites:

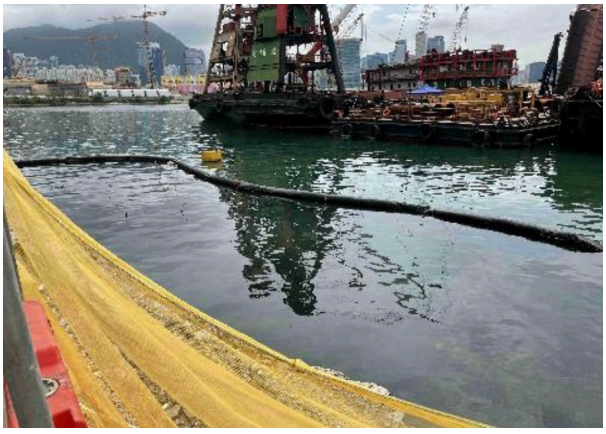
Best Practice Guide for Environmental Protection on Construction Sites (2013)

Providing earth bunds/channels to divert site runoff and wastewater to wastewater treatment facility.

Providing earth bund/channels at site boundaries to intercept surface runoff from leaking out of the site.

Treating wastewater from all sources by proper wastewater treatment facilities before discharging.

Providing earth bunds or geotextile for gullies to prevent discharging surface runoff without desilting.



Providing silt curtain for marine-based work.

Relevant information of water pollution controls at site can be found in Section 7 of Best Practice Guide for Environmental Protection on Construction Sites:

Best Practice Guide for Environmental Protection on Construction Sites (2013)

Providing suitable storage areas for segregating inert and non-inert waste.

Sorting general refuse on site for reuse and recycling.

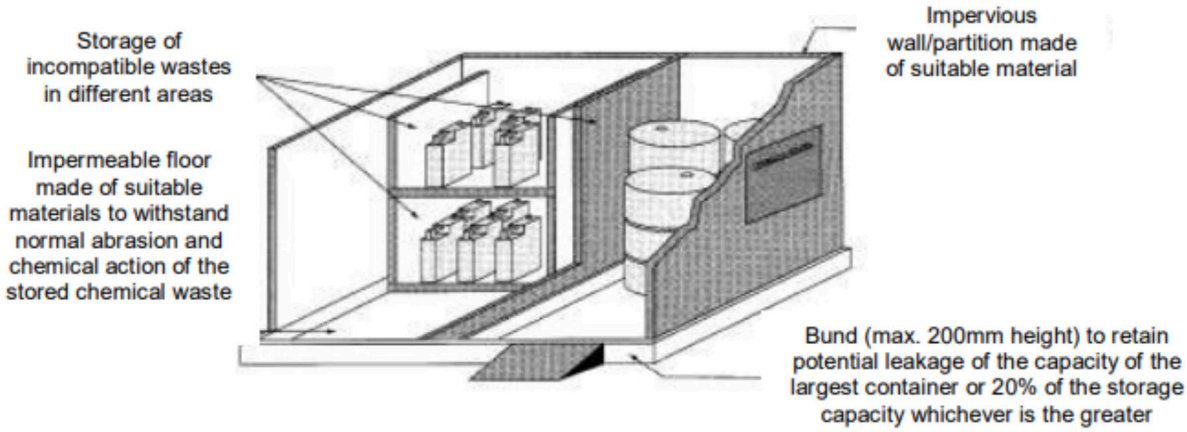
Disposing of the collected general refuse in garbage skip or bin regularly.

Relevant information of water pollution controls at site can be found in Section 8 of Best Practice Guide for Environmental Protection on Construction Sites:
Best Practice Guide for Environmental Protection on Construction Sites (2013)

Providing proper drip tray for chemical storage to prevent accidental spillage

Providing enclosed chemical waste storage facilities at site

The following figure shows the requirement of Enclosed Chemical Waste Storage Facilities:



Relevant information of water pollution controls at site can be found in Section 9 of Best Practice Guide for Environmental Protection on Construction Sites:
Best Practice Guide for Environmental Protection on Construction Sites (2013)

Green Supplier

Under the Development Bureau Technical Circular (Works) No.2/2011 and Environment Bureau Circular Memorandum No.1/2011, the use of recycled and other green materials in **public works** projects is encouraged. Contractor should observe the requirements of the use of **recycled and other green materials** in the contracts.

Public works projects which generate **inert C&D materials** are generally required to dispose of the materials at designated public fill reception facilities. However, Contractors are encouraged to use their best endeavours to identify other recycling facilities or construction sites, where such materials can be used subject to the approval of the subject Architects/Engineers.

Information of **green suppliers** for different kinds of construction or building materials are available in the following websites:

Eco-Product Directory of HKGBC website:
http://epdir.hkgbc.org.hk/xspsearch.php?serial=72

List of Recycled Construction Products of EPD website:
https://www.epd.gov.hk/epd/misc/cdm/products_list.htm#

Relevant information of green suppliers can be found in in the following website:
Waste Reduction Website of EPD:
https://www.wastereduction.gov.hk/en/household/Supplier_List.htm

List of Recognized Recyclers of EPD website:
http://www.wastereduction.gov.hk/en/workplace/index_lookforlistedrecyclers.htm

Collection of Grade 200 Recycled Rockfill from TKO137 Fill Bank:
https://www.cedd.gov.hk/eng/public-services-forms/fill-management/recycling-of-construction-demolition-c-d-materials/index.html

Recycler/ Waste Collector

Recycler/Waste Collector

Recycling is an important part of waste management for construction work which may reduce the amount of waste to be disposed of to landfill. To arrange handling of recyclable waste, Contractors may contact the recyclers and a list of recyclers is available at EPD's website.

A Hong Kong Collector/Recycler Directory can be accessed online:
https://www.wastereduction.gov.hk/en/quickaccess/vicinity.htm?collection_type=collector&material_type=all&district_id=0

Recycler for construction and demolition (C&D) materials

To encourage the Use of **Recycled and other Green Materials** in **Public Works Projects**, DEVB TC(W) 2/2011 sets out a comprehensive framework for the procurement of recycled and other green materials with a view to promote their use in public works projects. It also streamlines the process for recyclers which manufacture recycled materials to collect **construction and demolition (C&D) materials** and introduces a recycler's list for C&D materials.

DEVB TC(W) 2/2011 - Encouraging the Use of Recycled and other Green Materials in Public Works Projects is available online:
https://www.devb.gov.hk/filemanager/technicalcirculars/en/upload/310/1/C-2011-02-01.pdf

List of Recyclers for Construction and Demolition (C&D) Materials is available online:
https://www.wastereduction.gov.hk/en/workplace/index_lookforlistedrecyclers2.htm

Chemical Waste Collector

The Waste Disposal Ordinance provides for the licensing of waste collection, transport and disposal activities and the control on import and export of chemical waste. A **licensed chemical waste collector** should be employed and engaged for the collection before the disposal of chemical waste.

A list of licensed chemical waste collector is available at EPD's website:
https://cd.epic.epd.gov.hk/EPICDI/chemicalwaste/download/?lang=en

Neighbourhood Communication

It is important to maintain good relationship with neighbours in the vicinity of the construction site.

A suggested public relation strategy can be developed and implemented using the following approaches:

Set up clear communication channels

- Display **environmental hotline** at prominent locations along the site boundary.
- Provide contact details to key sensitive receivers such as schools and residential buildings nearby.
- Deploy **designated personnel** to be responsible for receiving, investigating, and responding to enquiries and complaints in a timely manner.

Meet with relevant stakeholders

- Explain details of the construction project.
- Organize activities and environmental promotion to engage with the public and neighbours.
- Show the mitigation measures such as noise barriers, dust suppression, treatment facilities being implemented on site.
- Consider posting results of environmental inspections and monitoring to demonstrate performance.

Monitoring and Measurement (if necessary)

In general, EPD or general public would appreciate the main contractor undertaking additional/further monitoring works in order to satisfy their own environmental policy, objectives and targets.

Tree Protection

Tree Protection

Trees play an important role in the city landscape and are valuable assets in our community. As it is common for development projects to reform and modify cityscape, trees are often unavoidably affected. To maintain greenery in our community, **tree preservation** is essential. Contractors should follow statutory and contractual requirements during planning and design stages of the project.

The Technical Circular DEVB TC(W) No.4/2020 sets out the policy, control procedures and detailed requirements that Government departments have to observe and follow to preserve trees at different stages of government projects as well as those under **Arboricultural maintenance,** including regular, complaint-initiated and all kinds of ad hoc maintenance. It lists out the requirements for tree preservations in public works. It also describes the requirements for feasibility stage, planning and design respectively.

Detailed information can be found in the Technical Circular DEVB TC(W) No.4/2020:
https://www.devb.gov.hk/filemanager/technicalcirculars/en/upload/372/1/C-2020-04-01.pdf

Resources to be arranged after the date of the Employer's letter of acceptance of the Tender

The Contractor may be required to assign a **competent member** with arboriculture knowledge of the site supervisory staff to oversee and supervise tree works related to **arboricultural operations and preservation of trees** onsite and any **compensatory planting** both onsite and offsite.

The assigned person should have attended relevant training in arboriculture organised by local and / or overseas training institutes with cumulative training of at least 30 hours in the past 3 years and have at least two years practical experience in arboriculture.

The Contractor should submit to the Architect / Engineer for approval within 30 days of the date of the Employer's letter of acceptance of the Tender particulars of the assigned person (including his name, experience and position) together with a copy of the certificate(s) issued by the training institute(s) confirming "his/her satisfactory completion of the relevant courses" and supporting documents on the required experience.

Sustainability Requirements

The circular on **Green Government Buildings** (Development Bureau Technical Circular No. 2/2015 and Environment Bureau Circular Memorandum No.3/2015) (the Joint Circular) sets out the best practicable targets to be achieved for green Government buildings, including the requirement that **renewable energy (RE) technologies** should be incorporated in all new Government buildings and all capital works projects as far as reasonably practicable.

All new government buildings of **CFA** above 5,000m^2 with central air-conditioning or above 10,000m^2 (e.g. fire stations and sports centres) should aim to obtain the second highest grade or above under the **BEAM Plus** as promulgated by the Hong Kong Green Building Council (HKGBC) as far as practicable. Other internationally recognised building environmental assessment systems which are suitable for Hong Kong's local use and the relevant building types may be considered with full justifications.

The Contractor should observe the sustainability requirements stated in the tender documents during tendering stage and allow sufficient budget and suitable personnel including **BEAM Pro** or **BEAM Co-ordinator**, to manage and implementing the requirements.

Relevant information of BEAM Plus New Buildings can be found in the following link:
https://www.hkgbc.org.hk/eng/beam-plus/beam-plus-new-buildings/

For some Infrastructure projects, other internationally recognized rating schemes may be adopted to drive the project sustainability performance. Possible schemes are:

1. **CEEQUAL** administrated by Building Research Establishment (BRE), UK **(https://www.ceequal.com/)**
2. **IS** Rating Scheme administrated by Infrastructure Sustainability Council of Australia **(https://www.isca.org.au/)**

The Contractor should check contract specifications before tendering.

Contractors should observe the contract requirements for the provision of **electric vehicles**. Electric Vehicles should be provided for each works contract in accordance with the minimum number as follows:

Number of contract vehicles supplied in a public works contract	Minimum number of EVs (5-seater or 7-seater) to be specified
2-3	1
4-5	2
6 or above	3

A designated medium-speed charger for each EV should be installed at the site accommodation of each works contract.

Reference information can be found in Development Bureau Technical Circular (Works) No.13/2020 - Timely Application of Temporary Electricity and Water Supply for Public Works Contracts and Wider Use of Electric Vehicles in Public Works Contracts by using the following link:
https://www.devb.gov.hk/filemanager/technicalcirculars/en/upload/378/1/TCW%2013-2020.pdf

To further promote green procurement and the use of **biodiesel**, the Government has already required, through tendering and contractual arrangements made from March 2016 and January 2017 respectively, the full use of biodiesel by non-road construction machinery in all newly tendered public works projects and public housing projects. Such machinery includes air compressors, generators, excavators, crawler cranes, crane lorries, road rollers, etc. ..." in HKSAR Press Release. **(https://www.info.gov.hk/gia/general/201906/05/P2019060500435.htm)**

Under the Development Bureau Technical Circular (Works) No.2/2020, it sets out the policy on the adoption of **Modular Integrated Construction (MiC)** for new building works with total **construction floor area (CFA)** larger than 300m2 under the **Capital Works Programme (CWP)** to be tendered on or after 1 April 2020. **Reference information** can be found by using the following link: **https://www.devb.gov.hk/filemanager/technicalcirculars/en/upload/375/1/C-2020-02-01.pdf**

Under the Development Bureau Technical Circular (Works) No.11/2020, it promulgates the adoption of sustainable designs and features in site accommodations for **Resident Site Staff (RSS)** in public works contracts. Reference information can be found by using the following link: **https://www.devb.gov.hk/filemanager/technicalcirculars/en/upload/379/1/TCW_11-2020.pdf**

Contractors are also recommended to consider promoting low carbon construction, emission reduction and the use of recycled materials in construction work and implementing measures including promoting the use of biodiesel as fuel for construction machineries in construction sites, adopting green site offices, and using waste glass as fill materials for reclamation works.

Environmental Permit (EP) Requirements

Environmental Permit (EP) Requirements

The Permit Holder and any person including Contractors working on a **Designated Project** under **Environmental Impact Assessment Ordinance** (EIAO) should comply with all conditions which include **General Conditions** and **Special Conditions** set out in the Project **EP**.

The following items in the EP should be checked and resources should be allowed if necessary:

- Employment of **EM&A** Personnel
- Employment of **Environmental Team (ET)**
- Employment of **Independent Environmental Checker (IEC)**
- Submissions and/or Measures to be Implemented before Construction and/or Operation of the Project
- Submissions and/or Measures to be Implemented during Construction and/or Operation of the Project
- Environmental Monitoring and Audit Requirements

Remark: The EP requirements of individual projects should be reviewed before commencement

Caution: If the Project/Contract is not a Designated Project under EIAO, this Section can be omitted.

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Environmental Permit (EP) Submissions

Environmental Permit (EP) Submissions

Under the **Special Conditions** specified in **EP, EP submissions** may usually include the following:

- **Submissions and/or Measures to be Implemented before Construction and/or Operation of the Project:**
  - Management Organizations
  - Construction Works Schedule and Location Plans
  - Date of Commencement of Construction of the Project
  - EP Submissions Schedule
  - Updated EM&A Manual
  - Construction Noise Mitigation Measures Plan (CNMMP)
  - Continuous Noise Monitoring Plan (CNMP)
  - Construction and Demolition Materials Management Plan (C&DMMP)
  - Contamination Assessment Report (CAR) and Remedial Action Plan (RAP)
  - Sediment Quality Report (SQR)
  - Sediment Management Plan
  - Marine Ecological Baseline Report
  - Marine Travel Route Plan
  - Silt Curtain Deployment Plan
  - Archaeological Action Plan
  - Landscape and Visual Plan
  - Transplantation Proposal for Plant Species
- **Submissions and/or Measures to be Implemented during Construction and/or Operation of the Project:**
  - Noise Mitigation Plan
  - Operational Ground-borne Noise Mitigation Measures Plan
  - As-Built Drawings of Measures for Mitigating Landscape and Visual Impacts
- **Submissions under EM&A Manual**
  - Monthly EM&A Report
  - Quarterly EM&A Review Report
  - Final EM&A Summary Report

The contractor should check statutory submission timeframe and respective particular specifications to identify the responsible party of individual EP submissions.

Caution: If the Project/Contract is not a Designated Project under EIAO, this Section can be omitted.

Implementation Schedule for Key Issue / Site Aspect

Implementation Schedule for Key Issue/Site Aspect

For **Designated Projects** under EIAO, an implementation schedule should be included in the **Environmental Monitoring and Audit Manual** which summarizes all recommended environmental mitigation measures. The contractor should review the contract's particular specification. If the Contractor is deemed responsible for implementing the recommended environmental mitigation measures, the Contractor should provide sufficient resources to execute the implementation of them for the period as specified by the schedule. The contractor should advise the permit holder as soon as practicable if there is any potentially impractical recommendation listed in the **implementation schedule,** such that timely amendment can be made, if necessary.

Typical mitigation measures which requires Contractor's implementation, including but not limited to the following:

1. Noise reduction – Contractors may be requested to control the potential noise disturbance to the nearby noise sensitive receivers, resources and implementation actions including but not limited to, to hire professional acoustic consultant to conduct acoustic measurement and prepare acoustic reports, construction of noise barrier and noise enclosure structures.
2. Suppression of fugitive dust on haul roads – Contractors may be required to provide watering to keep the main haul road dampen regularly, this may involve the procurement of water bowers and or water sprinklers.
3. Prevention of wastewater discharge – all wastewater should be treated according to the requirements of the TM-DSS[1] standards under the WPCO prior to discharge, Contractors might be required to provide wastewater treatment facilities to treat wastewater from site runoff and wheel washing activities etc.

More relevant information can be found in section 4, 6 and 7 of the Construction Best Practice Guide which can be accessed online via the following hyperlink:
Best Practice Guide for Environmental Protection on Construction Sites (2013)

Other relevant information can be found in the following website:
Technical Memorandum - Annex 21: Contents of an Environmental Monitoring and Audit (EM&A) Programme - **https://www.epd.gov.hk/eia/english/legis/memorandum/annex21.html** and;

Implementation Schedule for Mitigation Measures arising from the Environmental Impact Assessment Process [GN 5/2010] - **https://www.epd.gov.hk/eia/hb/materials/GN5.pdf**

1 *The Technical Memorandum - Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters*

Application updating of Environmental related Licence / Permit

Environmental Permit Application for a Further Environmental Permit under the EIA Ordinance (Cap. 499)

Where the responsibility for a **designated project** for which an **environmental permit** has been issued changes, the person who takes up the responsibility should obtain an environmental permit. An application can be made for a further environmental permit in the prescribed form. The **further environmental permit** should be obtained before he or she assumes the responsibility. The applicant should pay the prescribed fee. The further environmental permit would be issued if the Director is satisfied that there has been no **material change** to the designated project(s) covered by the current permit and the findings in the EIA report are still relevant.

The current permit holder can surrender the whole or part of the environmental permit after ceasing to be responsible, by submitting a form to the Director.

Application for a Variation of Environmental Permit under the EIA Ordinance (Cap. 499)

When the need for variation of conditions of an environmental permit arises, the permit holder could apply for a **variation of an environmental permit** under section 13 of the Ordinance in the prescribed form and pay the prescribed fee. The application will be processed within 30 days.

A variation of the environmental permit would be issued without the need for an environmental impact assessment report if the Director is satisfied that there is no **material change** to the environmental impact of the designated project with mitigation measures in place and the designated project complies with the requirements in the Technical Memorandum on Environmental Impact Assessment Process. Should the design for permanent works or major temporary works being developed in Construction Stage change materially from the assumptions in EIA report or EP conditions, variation of EP would be necessary subject to consultation to the EIAO Authority. If an environmental impact assessment report is required, the procedures described in sections 5, 6, 7 and 8 of the Ordinance should be followed.

Based on the changes of construction, Application of Further Environmental Permit and Variation of Environmental Permit should also be considered by Permit Holder or Contractor. Relevant information can be found in the following website:
https://www.epd.gov.hk/eia/english/guid/ordinance/guide7_4-8.html

The processing time required for application of environmental permits is summarised below:

Application under	**EIAO Statutory Time Limit (days)***
Further Environmental Permit	30
Variation of an Environmental Permit	30

The information is also available online at:
https://www.epd.gov.hk/eia/operation/english/appendix11_5.html

**Only counts on the Authority's response time but excluding the time for preparing supporting documents (e.g., Env Review Report, if required) for the application.*

Construction Noise Permit under Noise Control Ordinance (Cap. 400)

The construction noise permit should be renewed regularly based on the validity of permit, usage of PMEs and variations of construction area.

The requirements and procedure for application of permit for Construction Noise Permit can be found in the following link:
https://www.epd.gov.hk/epd/english/application_for_licences/guidance/application_maincontent36.html

It is a statutory requirement for the Authority to notify applicants of the outcome of the applications within 28 days after receipt of the applications. However, EPD aims to complete processing the applications within 14 days.
[Remarks: In general, only CNP applications of good quality meeting all criteria of relevant checklist(s) may be processed within 14 days. However, for complicated case necessitating assessments involving a few projects or insufficient information provided by the applicant, the processing time would take longer or leading to the refusal of issuing a CNP.]

The information regarding the timeframe for EPD to response to the CNP applicant after receiving the CNP application is extracted online from:
https://www.epd.gov.hk/epd/english/application_for_licences/guidance/cnp.html

Licence under the Water Pollution Control Ordinance (Cap. 358)

If a licencee wishes to change any of the conditions of his licence, e.g. change of the flow rate or quality of the discharge, he / she should make an application to EPD for variation of the licence. Any change to the raw materials used, the working method, or the production rate, will most likely cause changes to the flow rate or quality of the discharge. As a result, application for variation of licence conditions is required.

If a licencee wishes to renew the licence, he should make an application to EPD for renewal of the licence at least 2 months and not more than 4 months before the expiry date of the licence.

Relevant information can be found in the following link:
https://www.epd.gov.hk/epd/english/application_for_licences/guidance/aw_331.html

The applicants should check that all essential supporting information (such as copies of Business Registration Certificate, estimation of discharge flow rate, location of the discharge points, etc.) to be submitted along their application. The applicants are advised to plan ahead their applications and reserve sufficient time for application processing and settling of payment.

Chemical Waste Producer Registration

Registration is a one-off requirement and not subject to renewal. However, each registered chemical waste producer has the obligation to notify EPD of any change in the particulars of the registration. For example, changes in:

- Contact person
- Telephone number or fax number
- Correspondence address
- Company name
- Waste location
- Business Registration Certificate

Such notifications should be made in writing within two weeks of the change.
Relevant information for the Chemical Waste Producer Registration can be found in following website:
https://www.epd.gov.hk/epd/english/application_for_licences/guidance/aw_341.html

Changes to existing registration of **chemical waste producers** may take about 30 days for processing after receiving the notification of any changes to existing registration of chemical waste producers.

Application Forms for updating the Environmental Related Licence of Permit

All application forms can be found in the following website:
https://www.epd.gov.hk/epd/english/application_for_licences/applic_froms/forms.html

Update of Environmental related Registration

Air Pollution Control (Construction Dust) Regulation

Where any change relating to any of the particulars given in a notice is proposed, the contractor should give notice to the Authority of the proposed change.

The related application for **Form NB** can be found in the following website:
https://www.epd.gov.hk/epd/sites/default/files/epd/english/application_for_licences/applic_froms/files/cdr-e-nb.pdf

The changes will take effect after EPD acknowledge receipt of the applications.

Billing Account for Construction Waste Disposal

The applicant can use **Form 5** to change the account information which can be found in the following link:
https://www.epd.gov.hk/epd/misc/cdm/info/Form5.pdf

The timeframe for the changes to take effect should be similar to the timeframe for opening a **billing account**. Once EPD receives Contractor's application for the change of a billing account, it will usually take 2-4weeks for processing.

Environmental related Labelling

Noise Emission Label (NEL)

A Noise Emission Label (NEL) is required for each of the following items when used in a construction site at any time:

- Any Hand Held Percussive Breaker weighted above 10kg; and
- Any Air Compressor capable of supplying compressed air at 500 kPa pressure or above.

Application for a NEL

The Contractor should ensure that a valid NEL is available before the above items are used and they are fitted with NELs issued by EPD.

In case the original NEL is lost, a duplicate NEL can be applied by completing a prescribed form.

https://www.epd.gov.hk/epd/sites/default/files/epd/english/application_for_licences/applic_froms/files/epd5.pdf

Relevant information for the application of NEL can be found in Section 6.7 of Best Practice for Environmental Protection on Construction Sites:

Best Practice Guide for Environmental Protection on Construction Sites (2013)

Quality Powered Mechanical Equipment (QPME)

QPME is equipment that is recognized by EPD as new, notably quieter, more environmentally friendly and efficient. Typically, QPME is:

- Certified to comply with the European Council (EC) Directive 2000/14/EC; issued with Low Noise or Super Low Noise Emission Label by the Ministry of Land, Infrastructure and Transport of Japan (MLIT); and
- In compliance with other equivalent or better environmental standards; or for a piece of equipment with years of services (counting from the date of manufacture) less than 6 years, the validity period of the first label will be diminishingly apportioned.

For those QPME with validity of labels to be expired, the applicants may re-apply, within 6 months before the date of expiry, for the label with the provision of the following documents to demonstrate that the QPME still maintains with quality noise emission complying with the prevailing requirement implemented by the relevant parties.

Application for a QPME Label

A QPME label for individual item of equipment can be applied by submitting a completed application form to EPD. The application is free of charge and will be processed within **28 days**. The following documents should be submitted together with the application form:

- PME photos in hard or soft copy showing the serial number, the CE and SWL marking for EU equipment or the low noise / super low noise emission label for Japanese equipment;
- Manufacturer‘s documents showing equipment model type/number, serial number, manufacturing location and the commissioning date; and
- Either (a) EC Declaration of Conformity or (b) Japan MLIT letter together with the relevant noise test report/certificate attached.

Actions after Obtaining a QPME Label

If the application is successful, the equipment will be registered into the QPME database and the applicant will be assigned with a QPME User Account.

An user can login on to EPD QPME‘s website with the assigned User Account and print out the QPME label of the corresponding QPME on a piece of white paper then laminate with clear plastic. Then, the label should be affixed to the corresponding QPME.

Relevant information for the QPME Label can be found in Section 6.8 of Best Practice for Environmental Protection on Construction Sites:

Best Practice Guide for Environmental Protection on Construction Sites (2013)
Relevant information for the application, update and renewal of QPME label can be applied by completing a prescribed form(s):
https://www.epd.gov.hk/epd/english/environmentinhk/noise/qpme/howtoapply.html

Non-road Mobile Machinery (NRMM)

All **NRMM** newly supplied in Hong Kong must comply with the requirements of the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation (Cap. 311 sub. leg. Z).

Non-road mobile machinery (NRMM) means a regulated machine or a non-road vehicle.

- Regulated machine means any mobile machine or transportable industrial equipment that is powered by an internal combustion engine with a rated engine power output of which is greater than 19kW but not greater than 560kW.
- Examples are air compressors, drilling rigs, excavators, lifting platforms, loaders, mobile cranes, mobile generators, mobile pumps, and road works machines.
- Non-road vehicle means a private car, goods vehicle, bus, light bus, motor cycle, motor tricycle or not licenced under Cap. 374E.

Applications for approval or exemption of NRMMs, or for modification of approved/exempted NRMMs can be submitted via the web-based NRMM system starting from 1 June 2015. Applicants can also check whether a particular NRMM has been approved or exempted by EPD via the system.

#Note:
All exempted NRMM for generators, air compressors, excavators and crawler cranes were phased out in new capital works contracts of public works including design and build contracts, with an estimated contract value exceeding $200 million and tenders invited on or after 1 June 2019. Relevant information can be found in Technical Circular (Works) No.1/2015.

Application forms for NRMM can also be downloaded in the web-based NRMM system in the following link:
https://nrmm.epd.gov.hk/application/formDownload

The web-based NRMM system can be found in the following link:
https://nrmm.epd.gov.hk/application/common/home

Relevant information for Emissions Control of NRMM in Capital Works Contracts of Public Works can be found in the Technical Circular (Works) No.1/2015: **https://www.devb.gov.hk/filemanager/technicalcirculars/en/upload/335/1/C-2015-01-01.pdf**

Updating of Environmental Management Plan (EMP)

Updating of Environmental Mannagement Plan (EMP)

The EMP should be regularly updated which includes:

a) reviewing, updating and revising the **Environmental Management Plan** taking into account the comments made on the Environmental Management Plan by the Architect/Engineer and any other parties;

b) providing the actual quantities of **C&D materials** generated for the month by completing the monthly summary Waste Flow Table, and a forecast of the quan tities;

c) updating of the summary table for work processes or activities requiring the use of timbers for **Temporary Works** construction;

d) reviewing the adequacy of resources and facilities for on-site sorting of C&D ma terials;

e) reviewing the adequacy of the nuisance abatement measures based on measure ments taken on the various pollution parameters and public complaints; and

f) distribution of the revisions of the EMP to all relevant parties.

The Contractor should review and update the EMP at least monthly and submit hard copies of the updated part of the EMP and a soft copy in Microsoft Word format to the Architect/Engineer.

Relevant information for updating of environmental management plan can be found in Appendix D(a) of Technical Circular (Works) No.19/2005:
https://www.devb.gov.hk/filemanager/technicalcirculars/en/upload/19/1/C-2005-19-0-1.pdf

Updating of Waste Management Plan

Updating of Waste Mannagement Plan

Waste Management Plan (WMP) becomes part of the EMP.
The Contractor should review and update the WMP (if any) and incorporate the updated waste disposal records in the EMP at least monthly and submit the updated **EMP** to the Architect/Engineer.

If an individual WMP is required based on the contract requirements, the WMP should be updated at least monthly and include the following:

a) providing the actual quantities of **C&D materials** generated for the month by completing the monthly summary **Waste Flow Table,** and a forecast of the quan tities;

b) updating of the summary table for work processes or activities requiring the use of timbers for **Temporary Works** construction;

c) reviewing the adequacy of resources and facilities for on-site sorting of C&D materials.

Updating of Site Drainage Plan

Updating of Site Drainge Plan

The Contractor should update the **Site Drainage Plan** according to the changes of discharge points, drainage systems or desilting facilities. The updated Site Drainage Plan should be submitted to the Architect/Engineer or other relevant parties for approval.

Environmental Complaint

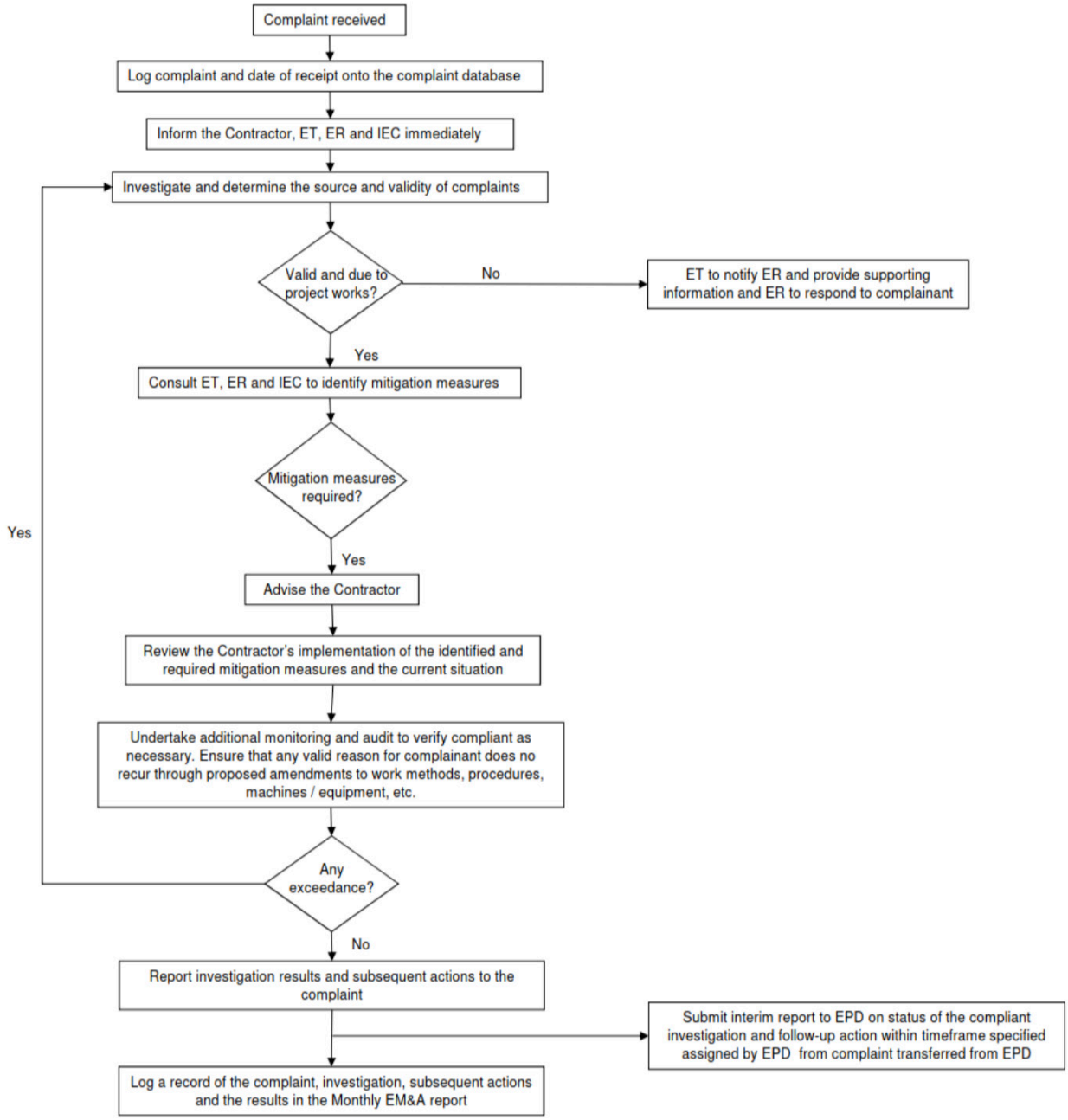
In general practices, once Contractors receive **Environmental Complaint(s)**, the following procedures should be undertaken:
The Contractor to log complaint and date of receipt onto the complaint database and inform the **ER, ET and IEC** immediately;

- The Contractor/ET to investigate the complaint to determine its validity, and assess whether the source of the problem is due to construction works of the Project with the support of additional monitoring frequency, stations and parameters, if necessary;
- The Contractor to identify mitigation measures in consultation with **IEC, ET and ER** if a complaint is valid and due to the construction works of the Project;
- The Contractor to implement the remedial measures as required by the ER and to agree with the ET and IEC any additional monitoring frequency, stations and parameters, where necessary, for checking the effectiveness of the mitigation measures;
- The ER, ET and IEC to review the effectiveness of the Contractor's remedial measures and the updated situation;
- The ET to undertake additional monitoring and audit to verify the situation if necessary, and oversee that circumstances leading to the complaint do not recur;
- If the complaint is referred by the EPD, the Contractor is to prepare an interim report on the status of the complaint investigation and follow-up actions stipulated above, including the details of the remedial measures and additional monitoring identified or already taken. The interim report shall be reviewed by the ET prior to submission to EPD within the time frame assigned by EPD; and
- The ET to record the details of the complaint, results of the investigation, subsequent actions taken to address the complaint and updated situation including the effectiveness of the remedial measures, supported by regular and additional monitoring results, in the monthly EM&A reports.

During the complaint investigation, the Contractor and ER should co-operate with and adhere to the advice of the ET and IEC for completion of the investigation. If mitigation measures are identified in the investigation, the Contractor should promptly carry out the mitigation works. The ER should ensure that the measures have been carried out by the Contractor.

Note: If the project is a **non-Designated Project** *under EIAO, IEC or ET will not be involved and the complaint investigation will be carried out by the Contractor.*

An Example of Complaint Handling Procedures (refers to Project EM&A Manual for Designated Projects under EIAO)



Environmental Mitigation Measures on Site

Environmental Mitigation Measures on Site

The common types of mitigation measures applied on construction site may include Air Quality, Noise, Water Quality, Waste Management and Landscape and Visual.

Air Quality

Contractors should provide dust mitigation measures or controls for the following activities, which include:

- Good housekeeping on site
- Erection of site boundary, entrance and hoarding
- Road opening / resurfacing Work
- Excavation or earth moving
- Site clearance
- Exposed surface in open areas
- Exposed dust generating stockpile
- Haul roads and access roads
- Loading and unloading of dusty materials
- Concrete production
- Disposal of dusty material
- Debris handling
- Pneumatic or power-driven drilling, cutting and polishing
- Blasting
- Control of dark smoke
- Implementing dust suppression measures
- Avoiding bad practice

Air Quality Monitoring is often required to verify performance under an **EM&A programme** or to validate the effectiveness of mitigation measures applied on site.

Practical examples of construction dust controls can be found in Section 4.4 of Best Practice Guide for Environmental Protection on Construction Sites with the following link:

Best Practice Guide for Environmental Protection on Construction Sites (2013)

Contractors should pay attention to the construction activities which may cause adverse noise impact and they include:

- Installation,
- Construction,
- Alteration,
- Repair,
- Maintenance and
- Demolition.

In order to minimize noise impact from construction activities, the noise mitigation measures below may be adopted:

- Developing and Implementing Noise Policy and Programme aiming to:
  - Minimize noise impact and avoid causing annoyance to noise sensitive receivers
  - Ensure compliance with all legislative requirements
- Use of **Quality Powered Mechanical Equipment (QPME)**
- Noise Mitigation Measures at Source such as
  - Hand-held Breakers
  - Excavator-mounted breakers
  - Equipment with internal combustion engines
  - Piling
  - Joint cutter/stone saw
  - Demolition and concrete breaking works
- Noise Mitigation Measures at Sound Propagation Path such as
  - Noise enclosures
  - Noise barriers
- Administrative Site Control to reduce noise impacts
  (e.g schedule of noisy works, switching off noisy equipment when not in use, lo cating noisy equipment away from NSRs, arranging regular maintenance for all PMEs...etc)

Noise Monitoring is often required under EM&A programmes or to evaluate the effectiveness of mitigation measures applied on site such as noise barriers.

Practical examples of construction noise controls can be found in Section 6.9 of Best Practice Guide for Environmental Protection on Construction Sites with the following link:

Best Practice Guide for Environmental Protection on Construction Sites (2013)

For a construction site, it includes the contaminated surface runoff and wastewater generated from dewatering, cleaning activities and sewage. Construction site wastewater can be divided into trade effluent, sewage effluent and contaminated surface runoff. Discharge of all effluents except discharge domestic sewage into communal sewers and unpolluted water into stormwater drains, river courses and water bodies are subject to control under WPCO and should be covered by a licence which specifies the requirements of the effluent discharge.

Mitigation measures or controls of construction site wastewater should be applied, which include:

- Site Drainage Management Plan
- Apply and obtain Water Discharge Licence before discharge
- Minimisation of generation of wastewater
- Installation of wastewater treatment system
- Reuse of treated wastewater
- Management and control of rainwater, groundwater and general site runoff

Water Quality Monitoring may be required to ensure the quality of the effluent discharged complies with licence requirements.

Relevant information of water pollution controls on site can be found in Section 7.3 of Best Practice Guide for Environmental Protection on Construction Sites:

Best Practice Guide for Environmental Protection on Construction Sites (2013)

Construction & Demolition (C&D) Material will be generated from construction works and can be classified as:

- inert substances and
- non-inert substances.

The principle of waste management should be properly planned and implemented to reduce waste generation during construction works as listed below:

- Avoidance;
- Minimization;
- Recycling;
- Treatment; and
- Disposal.

The mitigation measures or controls of waste management on site should be adopted, which include:

- Develop and implementation of Waste Management Plan
- Set up waste reduction targets
- Establish waste reduction programme
- Arrange on-site sorting
- Proper waste disposal
- Good housekeeping practice

Waste Management Implementation as stated in ETWB TCW No.19/2005 includes procedures on waste management requiring contractors to reduce the C&D material to be disposed of during the course of construction and can be found in the following:

www.devb.gov.hk/filemanager/technicalcirculars/en/upload/19/1/C-2005-19-0-1.pdf

Relevant information of waste management on site can be found in Section 8 of Best Practice Guide for Environmental Protection on Construction Sites:

Best Practice Guide for Environmental Protection on Construction Sites (2013)

Use of Skips

Contractors should follow the Guidelines for Mounting and Placing of Skips when using skips for collection and temporary storage of construction waste. The existing Voluntary Skips Management System, which includes the Certification Scheme for Skips, aims at facilitating skip users to meet the relevant requirements on road safety and environmental protection. Contractors should use skips certified compliance with the mounting requirements in the Guidelines under the Scheme.

Relevant information of Guidelines for Mounting and Placing of Skips can be found in the following:

https://www.td.gov.hk/filemanager/en/publication/skip_en.pdf

Chemical Waste arising during the construction phase may pose environmental, health and safety hazards if not stored and disposed of in an appropriate manner. The potential hazards include:

- Toxic effect to workers;
- Adverse effect on soil and water quality from spills and improper disposal; and
- Fire hazard.

Registration as a **Chemical Waste Producer** is required for construction sites generating chemical wastes including:

- Surplus adhesives with solvent content
- Spent lubricating oils and mineral oils
- Unwanted paint, paint thinners and paint removers
- Spent acid and alkaline solutions
- Spent solvent
- Waste containers
- Asbestos sheets/waterpipes/Asbestos waste
- Demolition wastes containing dioxins, asbestos, Polychlorinated biphenyls (PCB)
- Unwanted Dangerous Goods Classes 2, 3, 3A, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 8 and 9

Special handling and storing procedures are required for chemical wastes and relevant information can be found in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes, Code of Practice on the Handling, Transportation and Disposal of Asbestos Waste, Code of Practice on the Handling, Transportation and Disposal of Polychlorinated Biphenyl (PCB) Waste and A Guide to the Registration of Chemical Waste Producers which are available online at:

https://www.epd.gov.hk/epd/english/environmentinhk/waste/guide_ref/guide_cwc.html

The mitigation measures or controls of chemical waste management on site should be adopted, which includes:

- Good planning and housekeeping
- Minimising the generation of chemical waste
- Treatment/recycling/disposal of chemical wastes
- Packaging/labelling/storage of chemical wastes

Relevant information of chemical waste management on site can be found in Section 9 of Best Practice Guide for Environmental Protection on Construction Sites:

Best Practice Guide for Environmental Protection on Construction Sites (2013)

In general construction site, **land contamination** caused by construction activities may includes:

- Plant maintenance;
- Refuelling;
- Accidental spillage from storage of fuel, chemical and chemical waste; and
- Accidental leakage of fuel, hydraulic oil and lubrication oil from construction plant and vehicles.

The scale of the land contamination arising from these construction activities is usually very small. The Contractor may adopt the emergency procedure for chemical spillage for cleaning up any contamination.

If the construction work area contains any potential land contamination source, relevant mitigation measures will usually be stated in the particular specification (PS). The Contractor should check and review the PS and strictly follow the stated mitigation measures.

The Contractor should check whether a **Contamination Assessment Plan (CAP), a Contamination Assessment Report (CAR) and a Remediation Action Plan (RAP)** are available in the particular specification. For some contracts, the Contractor is required to prepare the CAP, CAR, RAP and **Remediation Report (RR)**.

Relevant information can be found in Section 10.5 of the Construction Best Practice Guide which can be accessed via the following hyperlink:

Best Practice Guide for Environmental Protection on Construction Sites (2013)

Tree Management will be recommended in the **Tree Survey Report** and the EIA Report which include:

- Tree management consideration (Retain, transplant and Felling of trees)
- Management of trees at construction site
- Control procedures for tree felling or transplanting
- Compensation
- Penalty for illegal tree felling

Felling of trees will only be considered as a last resort.

Contractors should observe and strictly follow relevant requirements stated in the particular specification.

Relevant information of Tree Management can be found in Section 11.2 of Best Practice Guide for Environmental Protection on Construction Sites:

Best Practice Guide for Environmental Protection on Construction Sites (2013)

Toolbox Talk / Training

The Contractor or any persons responsible for the project should provide an **environmental toolbox talk/induction training** to employees to minimize environmental nuisance and impact during their construction activities.
Toolbox talk/induction training should be arranged by the **Environmental Officer** and conducted by the Environmental Officer, **Environmental Supervisor** or other experienced supervisors throughout the construction period.

The following table shows the proposed topics recommended for toolbox talk/induction training:

Proposed Topics
Construction Dust, Air Emission and Suppression
Construction Noise and Suppression
Wastewater Handling, Discharge and Treatment Facilities
Waste Collection, Handling and Disposal
Handling and Storage of Chemicals / Chemical Waste and Handling of Chemical Spillage
Site Plant and Machinery (Operation and Maintenance)
Maintenance of Site Access, Site Boundary and Haul Roads
Breaking, Drilling, Cutting and Polishing
Loading, Unloading and Transfer of Material
Stockpiling
Housekeeping & Final Cleaning
Ground Investigation
Site Clearance
Formwork and Falsework
Building Demolition
Excavation
Backfilling, Deposition and Compaction of Fill Material
Scaffolding
Slope Stabilization
Percussive Piling
Bored Piling
Mini Piling, Sheet Piling, H-pile and Socket H-pile
Metal Works
Concreting
Grouting
Cement Debagging and Mixing
Road Maintenance
Marine Construction
Plastering and Painting
Fixing / Fixture & Glazing Installation
Environmental Abatement Facilities
Land Contamination
Protection and Preservation of Trees
Addition and Alternation
Control on Volatile Organic Compounds
Emission control on Non-road Mobile Machinery
Asbestos Control
Noise Emission Label
Use of Quiet Construction Equipment
Environmental Impact Assessment Ordinance

Note: Relevant information of toolbox talk/training can be found in the Environmental Toolbox Talk Training Kit published by Hong Kong Construction Association.

Other Environmental Training

Contractors should ensure that all site management staff should have attended and completed the “Environmental Management Course for Construction Managers” run by **HKIC** or similar training institutions as agreed by the Architect/Engineer.

If anyone of the site management has not attended the course, Contractors should arrange such staff to attend the required environmental course within 14 days from the date of employment of such staff on the site, and to complete the training within six months from the said date.

Contractors should ensure that the Environmental Supervisor should have attended and completed the “Environmental Protection Course for Environmental Supervisors” or equivalent organized by HKIC or similar training institutions as agreed by the Architect/Engineer. If any person who has not attended the course, Contractors should arrange such staff to attend the required environmental training within 14 days from the date of employment of such staff on the site, and to complete the training within six months from the said date.

Environmental Promotion (Green initiatives, recycling etc)

Environmental Promotion (Green initiatives, recycling etc)

Contractors are encouraged to incorporate their own **green initiatives** into their projects. There are practices currently adopted and fall into categories of energy conservation, water conservation, waste reduction etc.

The following examples are being adopted by some construction sites and often, Contractors are instructed to incorporate the initiative starting at early stage of the whole construction life cycle, from planning to procurement and implementation:

Energy conservation

- Use of photovoltaic/solar panel to convert energy from the sunlight to electricity to power equipment on-site.
- Provision of green roof which gives buffer to energy loss of a building which reduces the energy for air conditioning operation.
- Use of electric vehicles.

Water conservation

- There is a large demand of water for dust suppression or wheel washing on construction site. Wastewater generated on site could be reused for dust suppression after proper treatment.

Waste reduction and recycling

- There are engineering methods which can be used to recycle construction waste. For instance, **stabilization/solidification (S/S)** method can be adopted to solidify/stabilise potentially toxic pollutant in excavated sediment, this can turn the waste excavated sediment into material suitable for backfilling.
- Very often, in Contractor's particular specification, there are clauses focus on recycling of construction waste material and required the Contractor to conduct waste segregation and store different types of waste in different containers or stockpiles to enhance reuse or recycling of material as far as practicable.

Recognition Award / Competition

To enhance the environmental awareness of construction practitioners and encourage them to be actively involved in environmental protection in construction work. Contractors are encouraged to participate the following recognition awards and competitions organized by the Government or HKCA:

- **Considerate Contractors Site Award Scheme**
  More information regarding criteria and application form can be found via the following link:
  https://www.devb.gov.hk/en/construction_sector_matters/contractors/considerate_contractors_site/index.html

- **Hong Kong Awards for Environmental Excellence**
- **Hong Kong Green Innovations Awards**
- **Outstanding Green Achiever Commendation Scheme**
- **Outstanding Promotional Partner Commendation Scheme**

  More information regarding criteria and application forms can be found via the following link:
  https://www.ecc.org.hk/english/hkaee/awards.html#hkaee

- **HKCA Construction Environmental Award**

Plant Maintenance

Use of Powered Mechanical Equipment (PME)

According to the Air Pollution Control (Smoke) Regulations, dark smoke emission from stationary combustion sources is prohibited at the construction area. Contractors should take the following actions:

- Carry out routine maintenance of plant and equipment;
- Retrofit construction plant with particulate reduction device to reduce dark smoke emission;
- Divert plant exhaust away from public area.

An Introduction to the Air Pollution Control (Smoke) Regulations can be found in the following link:

https://www.epd.gov.hk/epd/sites/default/files/epd/english/environmentinhk/air/guide_ref/files/dark_smoke.pdf

Fuel Usage

Based on Air Pollution Control (Fuel Restriction) Regulations, the use of high sulphur content solid and liquid fuel for commercial and industrial appliances is prohibited. Contractors should take the following actions:

- Use **ultra-low sulphur diesel** for all diesel-powered plants and equipment.

Relevant information for Fuel Usage can be found in the following link:

https://www.epd.gov.hk/epd/english/laws_regulations/envir_legislation/leg_air.html

Environmental Issue caused by Plant Maintenance

Oil spillage during the plant maintenance and refuelling for PMEs usually happens at construction sites. In order to reduce the risk of spillage, the following practice is recommended to conduct:

- Use absorbent materials to absorb spillage of chemicals or chemical wastes. (Note: Used absorbent materials should be handled as chemical wastes). The following figures show the spill control kit and the handling of chemical spill.

Using chemical spill control kit

Using absorbent material for oil spillage at construction site.

Record Keeping

Record Keeping

Records are often required to be kept properly for a certain period of time for checking and verification, these records include environmental monitoring, construction and chemical waste generation and disposal, regular monitoring. The Contractor should maintain of the environmental records as required by particular specification.
The Contractor should follow the timeframe as stated in particular specification and/or statutory requirements.

Trip Ticket System (TTS)

Government has implemented the **Trip Ticket System (TTS)** since the year of 2005 to track the disposal of **construction and demolition (C&D)** materials using **Disposal Delivery Form (DDF)** or **CHIT**. A good record should be kept for tracking disposal of C&D material at designated disposal ground. The copies of the CHIT/DDF and the receipt should be maintained on site for future references. A **Daily Record Summary (DRS)** to record with details of daily disposal of C&D materials from the Site should be completed and maintained by the contractor.

Monthly Summary Waste Flow Table

As part of the EMP on waste management, the contractor should establish a mechanism to record the quantities of C&D materials generated each month and report the quantities to the Architect/Engineer Representative on a monthly basis, using the “Monthly Summary **Waste Flow Table**”.

Water Pollution Control Ordinance License

A Licence granted under the Water Pollution Control Ordinance (CAP. 358) always requires the following records to be kept in the premises for inspection by duly authorized officer(s) of the Authority:

- records of flow rate;
- nature and composition of the discharge;
- updated records of all monitoring information;
- records of all desludging and degreasing operation, and
- records of corresponding disposal operation.

Training

Records of environmental training including the site specific induction training and toolbox talks, etc. should be should be kept properly may be required to be reported in the monthly environmental report.

The following records should be provided, updated regularly and kept properly:

- Inventory of licences, registration particulars and permits;
- Inspection reports for weekly environmental walks;
- Inventory of complaints, inspections by enforcement authorities, abatement notices, environmental offences and convictions;
- Summary record of non-compliance of air, noise and wastewater pollution incidents;
- Summary record of delivery notes for ordering of ULSD from oil companies and the replenishment of such fuel to individual diesel-operated construction plant and equipment on the Site;
- Monthly Summary of Waste Flow Table;
- Summary record of chemical waste disposal;
- Summary record of trip ticket system;
- Records of environmental training;
- Records of timber usage;
- Summary record of quality powered mechanical equipment (QPME) used on the Site including their servicing period.

Relevant information for records can be found in Appendix C of Technical Circular (Works) No.19/2005:

http://www.devb.gov.hk/filemanager/technicalcirculars/en/upload/19/1/C-2005-19-0-1.pdf.

Implementation of EM&A Manual and Environmental Permit Submission

For **Designated Projects** under Environmental Impact Assessment Ordinance (EIAO), the **Contractor's responsibility under the EM&A** includes:

- To comply with the relevant contract conditions and specifications on environmental protection;
- To facilitate **Environmental Team (ET)**'s monitoring and site inspection activities;
- To participate in the site inspections undertake by the ET and **Independent Environmental Checker**, and undertake any corrective actions;
- To provide information / advice to the ET regarding works programme and activities which may contribute to the generation of adverse environmental impacts;
- To submit proposals on mitigation measures in case of exceedance of **Action and Limit Levels** in accordance with the **Event and Action Plans**;
- To implement measures to reduce impact where Action and Limit Levels are exceeded; and
- To adhere to the complaint handling procedures in accordance with the **EM&A Manual** and the Complaint Management Plan.

Contractor's responsibility under EP submissions

Apart from specific environmental requirements, in some cases, Contractors might be asked to adopt an existing **EP submission** as a basis to develop their own contract-specific documents, which should be reviewed by ET and IEC and approved by permit holders. Contractors should review their responsibilities under all EP submissions.

Project specific requirements under EP submissions

Project specific **EP conditions** are often incorporated into EP submissions. These conditions are tailored to mitigate specific project specific impact and varied from project to project. Contractors should review their responsibilities under all EP submissions.

Environmental monitoring, Event and Action Plan (EAP)

For **designated project** under Environmental Impact Assessment Ordinance (EIAO), environmental monitoring can timely find out when potential adverse impact arises. The **Environmental Team Leader (ETL)** will design an EM&A monitoring programme base on the project **EM&A manual**, action and limit level would be set with reference to the baseline condition prior to the commencement of project's construction works. If there is exceedance of the **action and limit level**, the actions stated in the **EAP** plan should be strictly followed.

The Contractor should strictly follow the requirement stated in the EAP of the project EM&A manual. In general, the Contractor's role in the event of exceedance covers the following key points:

- confirm receipt of ET's notification of the exceedance in writing,
- check all plants and equipment,
- to provide information per ETL's request i.e., status and condition of plants, equipment and mitigation measures, in order to assist ETL's investigation into the cause of the exceedance,
- to carry out inspection undertaken by the ET,
- to carry out corrective actions instructed by the project proponent,
- to submit proposals on mitigation measures in case of exceedance of Action and Limit Levels in accordance with the EAP, and
- to carry out preventive measure to prevent recurrence.

Testing and Commissioning (T&C) Monitoring

Testing and Commissioning (T&C) Monitoring

For **designated project** under Environmental Impact Assessment Ordinance (EIAO), the environmental permit may impose requirements for environmental monitoring during **testing and commissioning stage** or **operational stage.** including noise monitoring for traffic, post-construction monitoring for water quality.

If the monitoring is required to be carried out by specialists, the Contractor should provide all required support including provision of access, electrical supply, etc to the specialists. The Contractor should observe and strictly follow the requirements set out in the environmental permit and related documents such as **EIA report and EM&A** manual for the project.

More information of environmental monitoring and audit requirements can be found in Section 8 and Annex 21 of the Technical Memorandum of Environmental Impact Assessment by using the following link:
https://www.epd.gov.hk/eia/english/legis/memorandum/TM.pdf

Landscape and Visual

Landscape and Visual Monitoring (Operational phase)

(refers to Project EM&A Manual for details monitoring requirements)

All landscape and visual mitigation measures as recommended in the **EIA Report** and **EM&A Manual** are required to be monitored in regular basis (e.g. monthly / bi-monthly) during the Operational Phase for 12-month establishment period to ensure the effectiveness of the mitigation measures. If there is repeated non-compliance of the landscape and visual mitigation measures, the relevant parties should be informed and EPD should be notified as necessary. Contractors should undertake corrective measures to rectify the non-compliance.

Relevant Technical Circulars and Guidelines can be found in the following link:
https://www.greening.gov.hk/en/knowledge_database/technical_circulars.html

Caution: If the Project/Contract is not a Designated Project under EIAO, the above Part can be omitted.

Establishment Period

Some construction projects require Contractors to carry out routine **horticultural operations**, including watering, pruning, weeding, pest control, replacement of dead plants etc. to ensure healthy **establishment** of new planting for 12 months. This period also serves as a kind of warranty/guarantee on the quality of the plants supplied and installed by Contractors.

Examples of Elements During the Establishment Period

Compensatory Tree Planting

A compensatory tree planting proposal including locations of tree compensation should be prepared and submitted to seek relevant government department's approval, in accordance with ETWB TCW No. 3/2006 (Tree Preservation).

Horizontal Greening

Following installation of underground culverts, excavation or utilization of land for works or stockpiling, the ground should be backfilled, levelled and soiled as necessary for reinstatement prior to hydroseeding.

Reinstatement of Natural Water Courses

Where water courses have been affected by the works, naturalized streams paths should be provided as far as applicable, using excavated local rocks and stones in order to create a pleasing visual impression and potential enhanced ecological habitat.

Provide proper planting maintenance on the new planting areas

Planting maintenance such as watering, fertilizing, weeding, pruning and mowing etc. should start immediately after planting in regular basis.

Update / Surrender of Environmental related Licence / Permit

Testing and Commissioning

The Contractor should review the contract and particular specifications, subject to the exact contract specifications, environmental related licences/permits may be required for following circumstances at **T&C stage**:

- Licence under Water Pollution Control Ordinance (Cap. 358) for "**Trade Effluents**" from a permanent installation (e.g., water, wastewater treatment works, etc.) requiring discharge into drainage & sewerage systems, inland and coastal waters.
- Licence for **Specified Process** under Air Pollution Control Ordinance (Cap. 311) for the permanent works involving any specified process (e.g., chemical works, permanent set up of concrete batching plant, etc.)

Relevant information of application can be found under the topic - Application of Environmental related Licence / Permit of this Manual.

Surrender of Environmental Permit

According to Section 11 of Environmental Impact Assessment Ordinance (EIAO) (Cap. 499), a person who is issued with an environmental permit may surrender the whole or a part of the permit after ceasing to be responsible for implementing the whole or a part of the project. The applicant can use Form 7 for environmental permit surrender, and it can be found with the following link:
https://www.epd.gov.hk/eia/english/forms/files/application_7.pdf

In the application form, environmental permit holder can specify the effective date of surrender of a part or the whole of the environmental permit, it takes immediate effect after EPD acknowledge receipt of permit holder's application. EPD will subsequently update the list of environmental permits surrendered which can be accessed online at:
https://www.epd.gov.hk/eia/english/register/surrend/latest.html

Licence under the Water Pollution Control Ordinance (Cap. 358)

The Licence holder can surrender the wastewater discharge licence through a notification letter/email to corresponding Regional Offices of EPD. It should take immediate effect on the day after the permit holder notified EPD.

Application for Closure of Billing Account

Contractors can use **Form 6** to apply the billing account closure or reinstatement of an account. Form 6 can be found in the following link:

https://www.epd.gov.hk/epd/misc/cdm/info/Form6.pdf

Contractors should pay attention that all unused **CHITS** should be returned to EPD upon closure of the account. The completed application **Form 6** should be submitted in person to an office of EPD/CEDD (Full addresses of the offices are contained in Section VI of Form 6).

Disclaimer

The materials contained in this Construction Site Environmental Manual s (hereunder 'Manual') have been developed with every due care taking into account the circumstances of local working environment and requirements of the laws of Hong Kong. Any advice or comment in this Manual is given in this general context and should not be relied upon as a substitute for legal or other professional advice.

This document is produced to provide practical guidance on site environmental management aspects that meet legal obligations. There is no intention whatsoever to offer exhaustive guidance and interpretation of the environmental legislations and regulations of Hong Kong. Anyone wishing to affirm the legal position of individual facts or situation should refer to the relevant regulations and other related statutory documents or consult a lawyer.

Taking the advice and good management practice given in this document does not confer any immunity from legal obligations, both criminal and civil.

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