

**DRAINAGE SERVICES DEPARTMENT**  
**ADVICE NOTE NO. 1**

**APPLICATION OF THE DRAINAGE**  
**IMPACT ASSESSMENT PROCESS TO**  
**PRIVATE SECTOR PROJECTS**

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TO PRIVATE SECTOR PROJECTS**

**1. INTRODUCTION**

- 1.1 This Advice Note outlines the Drainage Services Department (DSD)'s assessment procedures for the drainage impact of private sector projects. The procedures aim at projects which require permission from the Town Planning Board under the Town Planning Ordinance or approval of the Lands Department (LandsD) for lease modification. The information contained herein will assist proponents of private sector projects in preparing project profiles, Drainage Impact Assessment (DIA) study and in addressing the projects' potential drainage impacts.
- 1.2 Many private sector projects may cause adverse impacts on drainage and flooding. These impacts and necessary mitigation measures need to be considered early at the project planning and design stages in order to minimize drainage and flooding problems.
- 1.3 The DIA process provides for a systematic approach in addressing drainage issues associated with any project. The primary objective of the DIA process is to demonstrate that with the implementation of necessary mitigation measures, the project will not cause an unacceptable increase in the risk of flooding in areas upstream of, adjacent to or downstream of the development.

**2. ROLES AND RESPONSIBILITIES OF PROPONENT**

- 2.1 The proponent of a private sector project is responsible for :
  - (a) preparing the project profile and undertaking the DIA study if required;
  - (b) implementing all measures necessary to mitigate adverse drainage impacts identified by the DIA study;
  - (c) monitoring the project's drainage performance during construction; and
  - (d) taking all measures necessary to redress unanticipated or unacceptable impacts arising during project construction.

- 2.2 The application of the DIA process to a particular project should not be separated from the other basic investigation and design processes. Thus, the proponent can integrate drainage, environmental, technical and economic assessments to produce the best and most appropriate project design.
- 2.3 The application of the DIA process and the acceptance of a DIA study do not imply approval for the project required under other legislations. The proponent will need to obtain the necessary statutory approvals by means of separate permit/license/approval applications.

### **3. ROLES OF DRAINAGE SERVICES DEPARTMENT**

- 3.1 In brief, DSD is responsible for examining project profile; determining whether DIA study is required; approving DIA study report submitted under the DIA process; and advising the Planning Department (PlanD) or LandsD of relevant drainage conditions on the project.
- 3.2 Notwithstanding that the proponent may have submitted proposals in accordance with the guidelines stipulated in this Advice Note and DSD may have accepted such proposals or have required such proposals to be amended prior to acceptance, DSD shall have no liability for any damage, injury, losses, claims, charges or fees which may arise from any act, omission or negligence howsoever caused by DSD, its agents, servants or employees.

### **4. THE DRAINAGE IMPACT ASSESSMENT PROCESS**

- 4.1 The DIA process comprises two principal elements, a project profile and, if necessary, a DIA study.
- 4.2 The project profile and DIA study require substantial engineering input and judgment, and should be undertaken under the direction of a registered professional engineer in the Civil Engineering discipline. Any submission made as part of the DIA process should be signed and certified by the registered professional engineer in charge. Failure to submit a satisfactory project profile for DIA study report, if required, may unnecessarily delay the DIA process.
- 4.3 Development projects within urban areas served by a public stormwater drainage system will generally be exempted from the DIA process, the exception being those developments which are of sufficient scale to make a significant change to the drainage characteristics of a stormwater drainage system.

- 4.4 In areas not served by a public stormwater drainage system, the scale of the development, the form and location will determine the necessity of DIA process. As a general rule, if the answer to any of the following questions is positive or unknown, DIA process shall be applied to the project :
- (a) will the flooding risk be increased due to a watercourse or drainage path be affected by the development?
  - (b) will there be a significant increase in impervious area and therefore a significant increase in runoff or change in runoff behaviour from the development site ?
  - (c) will reclamation or filling be required to form the site for the development ?
  - (d) will the drainage system downstream of the development site require to be upgraded to convey the runoff from the site ?
  - (e) will the development be situated at flood prone areas?  
(List of flooding blackspots refers to the website of DSD - [http://www.dsd.gov.hk/EN/Flood\\_Prevention](http://www.dsd.gov.hk/EN/Flood_Prevention))
  - (f) will the temporary works (e.g. scaffolding or falsework of a bridge) or any flow diversion anticipated to be implemented during the construction adversely affect the performance of the drainage system or aggravate the risks of flooding in its adjacent, upstream and downstream areas?
  - (g) will there be a significant reduction of flood storage capacity in the surrounding areas during or after construction?
- 4.5 If the proponent of a project is in doubt about the need for DIA process, he may consult DSD before submission of an application for planning permission or lease modification. During the consultation, DSD may require the proponent to furnish relevant project information for consideration.
- 4.6 In the event that the DIA process is considered necessary due to the likely impacts of the project on drainage and flooding, the proponent shall submit a project profile as part of his submission on the application for planning permission or lease modification. Alternatively, if the proponent considers appropriate, they may make a direct submission of DIA study instead of the project profile.
- 4.7 The PlanD or LandsD will refer the planning application or lease modification application including the project profile if any to DSD for consideration.

- 4.8 If a project profile is considered necessary but it has not been submitted together with the application, DSD will advise the PlanD or LandsD to suggest the proponent to submit a project profile or a DIA study for consideration. If the project profile or DIA study is not submitted in time, DSD will assess the application on the basis of the information contained in the submission.

### **Project Profile**

- 4.9 An outline of the information required for the project profile is given in **Appendix I**. Based on the information in the project profile, DSD will decide whether a DIA study is required by considering the likely impact of the proposed project on :
- (a) the existing capacity of watercourses and drainage paths;
  - (b) the changes in surface runoff hydrographs and flood storage; and
  - (c) the risk of flooding in other areas in the catchment.
- 4.10 The likely mitigation measures required and the overall drainage impacts of the proposed project after undertaking all mitigation measures will also be considered. If the drainage impacts arising from the proposed project are likely to be serious or the necessary mitigation measures are likely to be technically complicated, a DIA study will be required.
- 4.11 A DIA study will not normally be required if :
- (a) the assessed adverse impact on drainage is limited; and
  - (b) the proponent has provided adequate details of specific mitigation measures to be included in the project; and
  - (c) the proponent has demonstrated clearly that the development with all mitigation measures, will not cause an unacceptable increase in the risk of flooding in areas upstream of, adjacent to or downstream of the development.
- 4.12 DSD will base on the submitted project profile or the information contained in the application if a project profile has not been included in the submission and advise the PlanD or LandsD that the application for planning permission or lease modification :
- (a) may be approved subject to the imposition of planning/development conditions of carrying out a subsequent DIA study on the project and implementation of any necessary mitigation measures; or

- (b) may be approved subject to provision of proper drainage facilities for the project; or
- (c) should be rejected due to insurmountable drainage impacts.

#### **Drainage Impact Assessment Study**

- 4.13 The scope and requirements of the DIA study shall be proposed by the proponent for DSD's agreement. An outline of the information likely to be required for a DIA study report is given in **Appendix II**. Any deviation may be proposed by the proponent and agreed by DSD. If the situation so warrants, DSD will advise the proponent of other special requirements of the DIA study to suit the characteristic of an individual project. The findings of the DIA study shall be documented in a report prepared by the proponent for submission to DSD and the PlanD or LandsD.
- 4.14 If the method of construction cannot be ascertained at the time of the DIA study, the DIA for the construction stage shall be based on the method of construction most likely to be adopted.
- 4.15 The DIA study shall be carried out in accordance with the standards set out in DSD's prevailing Stormwater Drainage Manual or as agreed with DSD.
- 4.16 The findings of the DIA study will be used as the basis for setting any requirements on drainage provisions, flood mitigation measures and performance monitoring tasks which may be placed on the project. DSD will advise the PlanD or LandsD of such requirements on the project as appropriate.
- 4.17 For cases of application of extension of time for commencement of development after the DIA study has been approved, the proponent shall be responsible to demonstrate that the previously approved DIA study would still be valid. If considered necessary, DSD may require the proponent to submit a revised DIA study or impose modified/additional mitigation measures as appropriate in order to cater for the changes due to the deferred commencement of the development.

#### **5. DESIGN, IMPLEMENTATION AND MONITORING OF MITIGATION MEASURES**

- 5.1 The proponent shall be responsible for incorporating the study findings, including the agreed drainage impact mitigation measures into the design of the project to ensure that the expected drainage performance of the project is achieved. During submission of Drainage Plan, Site Formation Plan, etc to the Buildings Department and DSD for approval, the Authorized Person in charge of the project should state in writing that necessary mitigation measures identified in the DIA study have been incorporated into the plans.

- 5.2 The proponent shall be responsible for implementing the drainage impact mitigation measures and undertaking the monitoring programme during the construction stage to ensure compliance with the conditions on drainage requirements, flood mitigation measures and performance monitoring requirements as imposed by the Town Planning Board or LandsD.
- 5.3 DSD shall recommend the LandsD to issue a Certificate of Compliance for a development which has undergone the lease modification process only if the imposed conditions on drainage requirements and flood mitigation measures have been fulfilled.
- 5.4 The proponent shall sort out and agree with the maintenance parties on any requisite monitoring programme during the operation stage. The responsibility for undertaking such monitoring programme, if necessary, shall rest with the maintenance parties. Depending on the nature and type of the drainage works, the maintenance parties may be the proponent himself, his agent, other person or DSD.

**INFORMATION REQUIRED FOR PROJECT PROFILE**

In order that the need for a DIA study can be assessed, the project profile should include all relevant information available. Information should be in note form. The checklist below is provided as a guide only, to assist in identifying major items which should be included or considered in completing the project profile.

**1. AN OUTLINE DESCRIPTION OF THE PROJECT**

Provide the following information :

- Project title
- Proponent
- Contact Person (name/telephone)
- Nature and description of the project
- Location (include plans)
- Area of project site and % paved/unpaved (existing and proposed)
- Level to be filled up
- Whether planning permission application is required
- Whether lease modification application is required
- Statutory land use zoning
- Recent and dated photographs to shown a panoramic view of the site

**2. AN OUTLINE OF THE PLANNING AND IMPLEMENTATION PROGRAMME**

- a) Explain how the project will be planned and implemented  
e.g. authorized person/consultants/contractor.
- b) Identify the project timetable for :
  - appointing consultants/authorized person
  - planning/preliminary designs
  - preparing a DIA study (if required)
  - finalizing designs
  - implementation
  - completion/commencing operation
- c) Identify any interactions with other projects which should be considered.

### 3. **AN OUTLINE OF THE EXISTING DRAINAGE**

Provide the following drainage details :

- A 1:20000 scale plan of the catchment in which the project site is located with the drainage system relevant to the proposed project highlighted.
- A detailed layout plan at 1:5000 scale or larger, of the project site with the site boundary, existing ground levels, existing drainage and existing land uses all identified both within and adjacent to the project site.
- A general description of the existing drainage including adequacy of the drainage system and flooding history, as well as identification of any Ecologically Important Streams/Rivers (EIS) as defined under ETWB TCW No. 5/2005 affected by the project.

### 4. **OTHER INFORMATION**

Provide the following information :

- Potential drainage impacts (described in broad terms) arising from the project.
- A general description of the proposed drainage impact mitigation measures (if any) to be provided.
- A general description of the proposed drainage system.
- A general statement on the flooding situation upon completion of the project.

Any other available information relevant to **Appendix II** may also be submitted to facilitate DSD in deciding whether a DIA study is required. Submission of sufficient information under this heading may enable DSD to make an early decision on whether exemption from submission of a DIA study can be granted.

**INFORMATION REQUIRED FOR  
DRAINAGE IMPACT ASSESSMENT STUDY**

In order that the DIA study can be completed as quickly as possible, the DIA study report should include all relevant information available. In addition to the information submitted in the project profile (**Appendix I**), the following information should be included in the report. The checklist below is provided as a guide only, to assist in identifying major items which should be included or considered in completing the DIA study.

The findings of the DIA study should be documented in a report prepared by the proponent which will then be used as the basis for setting any requirements on drainage provisions, flood mitigation measures and monitoring requirements which may be placed on the project.

**1. AN OUTLINE OF THE CURRENT FLOODING SUSCEPTIBILITY  
AND PROPOSED DRAINAGE**

Provide the following details :

- An assessment of the susceptibility of the project site to flooding, preferably with a record of any past flooding which occurred within or adjacent to the project site.
- A detailed layout plan, at an appropriate scale, of the project site with the site boundary, proposed ground levels and proposed drainage, including any necessary upgrading drainage works within the catchment, and proposed land uses, all identified. If the proponent is aware that the ground levels or drainage or land uses adjacent to but outside the project site are likely to change, details should be provided if possible or, alternatively, attention drawn to the fact that changes are likely.
- For a project which involves reclamation or large development, an assessment of the likely drainage impacts created by all other planned developments and planned drainage improvement works, of which the project forms only a part, in the upstream areas and hinterland within the same drainage basin.

**2. AN OUTLINE OF THE CHANGES TO THE DRAINAGE  
CHARACTERISTICS AND POTENTIAL DRAINAGE IMPACTS  
WHICH MIGHT ARISE FROM THE PROPOSED PROJECT**

Provide the following details to quantify the changes to the drainage characteristics of the catchment arising from the proposed project :

- Changes in land use and surface runoff characteristics.
- Changes to surface runoff hydrographs for 2, 10, 50 and 200 years

return period flood events for the project site and at the affected watercourses.

- Change in flood storage caused by the project.
- Assessment of timing of peak runoff from project site relative to timing of catchment peak runoff.
- Hydraulic bankfull capacity of existing drainage upstream, within and downstream of project site.
- Hydraulic bankfull capacity of proposed drainage upstream, within and downstream of project site.
- Changes in peak runoff, peak flood levels and/or peak velocities for 2, 10, 50 and 200 years return period flood events at critical locations.
- Details of temporary drainage during construction including hydraulic capacities.
- Details of permanent and temporary works in or over the existing drainage systems, channels, rivers and stream courses.

Provide details of all potential impacts which might arise as a result of changes to the drainage characteristics caused by the proposed project and identify land users who might be affected. Provide details of the impacts caused by the following :

- Changes in flood levels, flood frequency and/or velocities.
- Changes in timing and magnitude of runoff peaks.
- Changes to maintenance requirements and access for maintenance.
- Changes to the drainage paths and regime during construction and thereafter.
- Changes to any Ecologically Important Streams/Rivers (EIS) affected by the project.
- Cumulative effects taking account of other concurrent developments in catchment.
- Other relevant considerations.

The potential impact should be considered on upstream, downstream and adjacent land users, and land uses should be identified (e.g. residential, commercial, institutional, industrial, infrastructure, agricultural, recreational, conservation areas).

### 3. **DETAILS OF ANY PROPOSED DRAINAGE IMPACT MITIGATION MEASURES AND ANY FURTHER DRAINAGE IMPACT IMPLICATIONS**

Provide details of any proposed drainage impact mitigation measures. The mitigation measures for the construction stage should also be included. The following is a non-exhaustive list of items which should be considered :

- Channel improvements.

- Underground stormwater drainage conduits (such as pipes and box culverts).
- Flood storage and runoff control devices (e.g. orifices, throttle pipes, weirs and float or electrically operated gates).
- Stormwater pumping.
- Soakaways.
- Floodproofing/flood compatible materials.
- Enhanced maintenance.
- Works to enhance drainage maintenance (e.g. sand traps, desilting ponds).
- Contractual controls (during construction).
- Other compensation measures.

The proponent should seek to mitigate adverse drainage impacts through application of best practical means which preferably will require minimal management, operational and maintenance commitments. Nonetheless, the proponent should aim at achieving the greatest extent of compatibility between his proposed mitigation measures and the long term drainage improvement proposals within and/or around the project site, if any, so as to avoid any possible abortive works.

#### 4. **DETAILS OF ANY PROPOSED MONITORING REQUIREMENTS**

Provide the monitoring requirements/programme during construction stage to ensure that the project's expected drainage performance is achieved.