Technical Note No. 1

Technical Note to prepare a

DRAINAGE SUBMISSION

Relating to applications for temporary change of land use
such as temporary storage areas, car parks, workshops, small factories…etc.
under S.16 of the Town Planning Ordinance

DRAINAGE SERVICES DEPARTMENT

December 2024

CONTENTS

1. Background

Development in the New Territories has been rapid. The demand for changing land use to other temporary uses such as "open storage" or "car-park" has been high and ever increasing due to economic reasons. These changes in land use may cause flooding when the sites are filled or paved without suitable drainage systems, in flood prone area. As such, in processing a Section 16 application for such temporary change of land use, an applicant is often requested by Drainage Services Department (DSD) to make a submission to demonstrate that the proposed use of the site would not have adverse drainage impacts on the drainage issue to the area.

This Technical Note aims at helping an applicant to visualize his important role in the prevention of flooding caused by his development and to provide step-by-step guideline to help the applicant to prepare his drainage submission for change of temporary land use to meet the requirement of DSD.

2. Role of Drainage Services Department

DSD shall examine the technical aspects of the drainage submission submitted by the applicant. The purpose of DSD's examination is to ensure that the submission will satisfy the basic requirements of a drainage submission and to offer technical comments where appropriate.

However, the applicant should take full liability whatsoever of the consequences arising from the implementation of his drainage submission. DSD shall have no liability, under all circumstances, to the applicant for any damage, injury, losses, claims, charges or fees arising from the works proposed in the drainage submission, including those amendments after taken into account of DSD's comments.

The applicant shall also note that the acceptance of his drainage submission does not imply approval or otherwise for the project required under the Town Planning Ordinance or other legislations. He will still be required to obtain the necessary statutory approvals by means of separate permit/licence/approval applications.

3. Types of Sites and Types of Drainage Submissions Required

Rainwater may cause flooding if it is not properly collected, conveyed and discharged. Common construction activities such as earth filling, hard surface paving and building of houses, huts…etc. may increase the risk of flooding. To alleviate the risk of flooding caused by these activities, the applicant is required to submit a drainage submission to demonstrate how he will collect, convey and discharge rainwater falling on or flowing to his site.

(a) Simple Sites

For development sites, which are less than 1 ha in size and neither fall within flood-prone areas such as low-lying areas and flooding blackspots nor involve pond filling and substantial earth filling, are regarded as simple sites. The drainage requirements are normally basic. The applicant is normally required to submit a typical drainage proposal.

(b) Complicated Sites

For development sites which are larger than 1 ha in size, or sites adjacent to or encompassing a major stream, channel or river etc., the drainage impact of the development may be significant. As such, the applicant has to submit a drainage submission in accordance with DSD Advice Note No.1. The drainage submission should include the proposed drainage facilities required to mitigate the adverse drainage impacts.

The above classification provides an indication only. The exact classification shall be determined based on the actual site condition and the site formation works involved in each individual application. Therefore, the applicant should as far as possible provide this kind of information in their application submissions.

4. Need to Appoint Engineers to Prepare the Drainage Submission

In order to protect his own interest from any possible damages due to flooding caused by his proposed works, even if it is a simple site, it is advisable for the applicant to employ a qualified engineer (Registered Professional Engineer in the Civil Engineering discipline) to prepare for his drainage proposal.

For a complicated site, the applicant should refer to DSD Advice Note No. 1 and should employ a qualified engineer (Registered Professional Engineer in the Civil Engineering discipline) to complete the drainage submission as requested. The completed drainage submission should be signed and certified by the qualified engineer in charge before it is submitted to DSD for comment.

5. Main Points to be Considered in Preparing a Drainage Submission

(a) Simple Sites

When preparing for a drainage proposal, the following basic drainage aspects should be considered.

i. Existing Stormwater Drains, Streamcourses, Pipes etc.

An applicant must find out whether there are any existing streams and stormwater drains within or in the vicinity of his site.

It is important that the applicant of the site does not disturb these streams and drains by obstructing them or making them smaller because this will cause flooding.

If the applicant does disturb the streams and drains, then the applicant must provide new channels and pipes of equivalent flow capacity as replacements respectively, without worsening the original drainage condition.

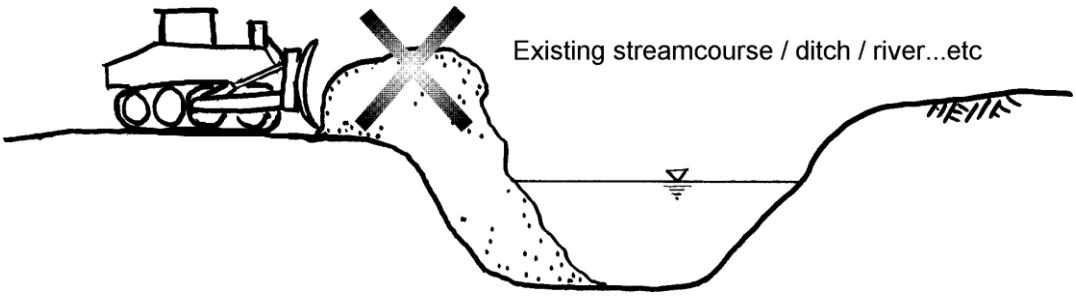


Fig. 1: Blocking a stream will cause flooding

ii. Drainage Network with Proper Discharge Point

The applicant should show clearly how the rainwater falling onto his site will be collected by the existing and/or proposed drainage system and conveyed to a proper discharge point(s). The discharge point can be an existing ditch, streamcourse, channel, river or underground stormwater pipe but the applicant should check and ensure that the flow from his site will not overload the existing drainage system.

A surface channel at the periphery of the site should be constructed to intercept all such rainwater falling onto the site.

iii. Earth Filling

Large-scale earth filling and change of formation level may block the natural drainage path and increase the risk of flooding.

The applicant should avoid substantial landfilling activities and change of formation level. In case that raising of formation level is unavoidable, the applicant must provide adequate additional intercepting drains to convey the surface rainwater from the adjacent land.

iv. Surface Paving

Impervious paving such as concrete or bitumen will increase the surface runoff. The applicant should use porous granular materials, such as graded rubbles, or similar recycled materials like broken and graded used concrete, to form the surface paving. The surface

paving could be formed by suitable compaction of the materials. However, the applicant should avoid using cementing and bituminous materials for bonding as far as possible since they would prohibit infiltration into the ground.

v. Run-in/Run-out

Care should be exercised in forming run-in/run-out if there is any existing open channel, stream or ditch running across the entrance of the site. The applicant must propose proper measures such as decking or replacement by a pipe of equivalent size and same capacity. The soffit level of run-in/run-out must have adequate clearance above the channel bank, e.g. at least 300mm free-board. When designing the run-in/run-out, the applicant should also consider whether the drain will be more likely to be blocked when it is decked or replaced and whether clearing of the drain will be hindered by the decking or other works.

iv. Boundary Fence/Boundary Wall

Solid boundary wall is not recommended because it will obstruct the existing flow path. In case where the use of solid boundary wall is unavoidable, the applicant should construct open channels of adequate sizes on both sides of the wall, and construct adequate openings at the foot of the wall to allow the passage of rainwater.

(b) Complicated Sites

The above considerations for simple sites could not cover the considerations for complicated sites. The applicant of a complicated site should refer to DSD Advice Note No. 1 for different considerations required for a comprehensive drainage impact assessment.

(c) Innovative/Smart Drainage Design

The applicant is encouraged to incorporate innovative / smart drainage design e.g. flood monitoring sensors, flood storage tanks with adjustable weirs, etc. as appropriate in the drainage submissions.

6. Content of a Drainage Submission

(a) Simple Sites

A drainage proposal should normally include a drainage plan showing the details of the existing drains and the proposed drains together with adequate supporting design calculations. These details should include the type and the dimension of the drains.

i. Records of Existing Stormwater Drains

The applicant should provide information on the existing stormwater drains, such as peripheral U-channel, ditch, streamcourse, …etc. within and around his site and state clearly whether he would remove, modify or retain these drains.

The applicant can make use of these existing stormwater drains as part of his proposed drainage networks and include them in his drainage proposal as long as their working conditions are satisfactory. In this case, records such as photographs and plans showing these drains shall be provided.

ii. Proposed Drainage Works

The applicant should indicate clearly the proposed drainage works for his site. Common measures include improvement of nearby existing drainage networks, construction of channels, choice of porous surface paving...etc. However, the applicant should note that different measures may be required according to the type of development and the characteristic of each individual site.

Typical construction details of U-channel and catchpit are shown in the **Appendix A** to this note.

iii. Plans and Sketches

Plans/sketches showing the general information of the site such as topography, fall direction, proposed paving and formation level, position of the buildings or structure, details of existing and proposed drains (size, alignment, flow direction, invert levels, gradient and materials etc.), and nearby available discharge points within the vicinity of the site, etc., should be submitted.

A sample showing a drainage layout plan for a typical simple site is enclosed in the **Appendix B** to this note for reference. The applicant should however note that the details of each site should be designed to cope with its own characteristics.

iv. Calculations

The applicant should also submit calculations according to the latest version of DSD Stormwater Drainage Manual to show that the proposed drainage system is adequate for the rainwater from the site and where relevant, also from areas outside the site if the proposed drainage systems will also collect rainwater from other areas such as the cases mentioned in sections 5(a)(iii) and (iv). For simple site as defined in section 3(a), the applicant can make reference to the table below for choosing the size of surface channels for collecting rainwater within the applicant's site only. However, the applicant should note that the following table only applies to sites having a

gradient greater than 1 in 200. For flatter sites, the applicant should provide larger channel with supporting calculations.

Site area	**Size of U-channel (H) [(1)] at 1 in 200 gradient**
$\leq 100m^2$	150mm
$\leq 350m^2$	225mm
$\leq 900m^2$	300mm
$\leq 1,800m^2$	375mm
$\leq 3,000m^2$	450mm
$\leq 5,000m^2$	525mm
$\leq 6,000m^2$	2 × 450mm [(2)]
$\leq 10,000m^2$	2 × 525mm [(2)]

Notes:

(1) See **Appendix A** for the definition of size of U-channel (H).

(2) Balancing holes in between twin U-channels shall be provided. Other equivalent sizes of U-channel with more or same flow area could be considered to suit various site conditions.

v. Checklist

A checklist is provided in the **Appendix C** to this note to facilitate the preparation of a drainage proposal for simple sites.

(b) Complicated Sites

As pointed out in section 3(b), the drainage submission for complicated sites shall be prepared in accordance with DSD Advice Note No. 1.

7. Forwarding Drainage Submissions and Vetting Time

When the drainage submission is ready, the applicant should forward it to Planning Department (PlanD) and DSD at the same time. DSD will comment on the submission and return comments to the applicant via PlanD. The normal vetting time shall follow the prevailing practice promulgated by relevant Bureau/ Departments.

8. Arrangements for Inspections of Drainage Works upon Completion

Upon the satisfactory drainage submission, the applicant should implement and complete the proposed drainage facilities as per their submissions as soon as possible. When they are completed on site, the applicant should serve a notice of completion of works (with photos showing the completed works) to PlanD and DSD at the same time. DSD will arrange inspections to check on site if they are in order. The applicant will be informed of the results of the inspections via PlanD. In view of the increasing public expectation on flood protection, the applicant should only operate the development site after the satisfactory completion of the inspections.

9. Maintenance of Completed Drains

Regular maintenance such as routine desilting is essential for all drains, catchpits and streamcourses to avoid blockage and deterioration. The applicant should ensure and keep all drainage works proposed by him, after construction, under proper maintenance during the occupation of the site. In this connection, the applicant shall ensure during the design stage that those drains constructed under his drainage submission are accessible and maintainable at all times.

10. Further Enquiry

Some frequently asked questions are compiled in **Appendix D** of this note for reference.

For further enquiries, please contact us at 2877 0660 (email: enquiry@dsd.gov.hk) for general enquiries or the following divisions of the DSD:

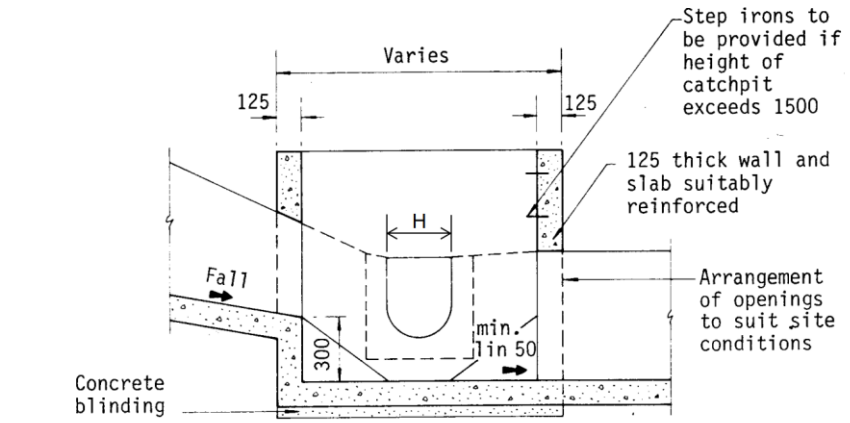
	Telephone No	**Fax No**
Mainland North Division (For sites at North District, Yuen Long, Tuen Mun and Tai Po) Office Address: 11/F, Kowloon Government Offices, 405 Nathan Road, Kowloon	2300 1146	2770 4761
Mainland South Division (For sites at Kowloon and other districts in New Territories) Office Address: 14/F, Kowloon Government Offices, 405 Nathan Road, Kowloon	2300 1304	2771 9640
Hong Kong and Islands Division (For sites at Hong Kong Island and islands district) Office Address: 23/F, 1063 King's Road, Quarry Bay, Hong Kong	3101 2351	3582 0759

11. Reference

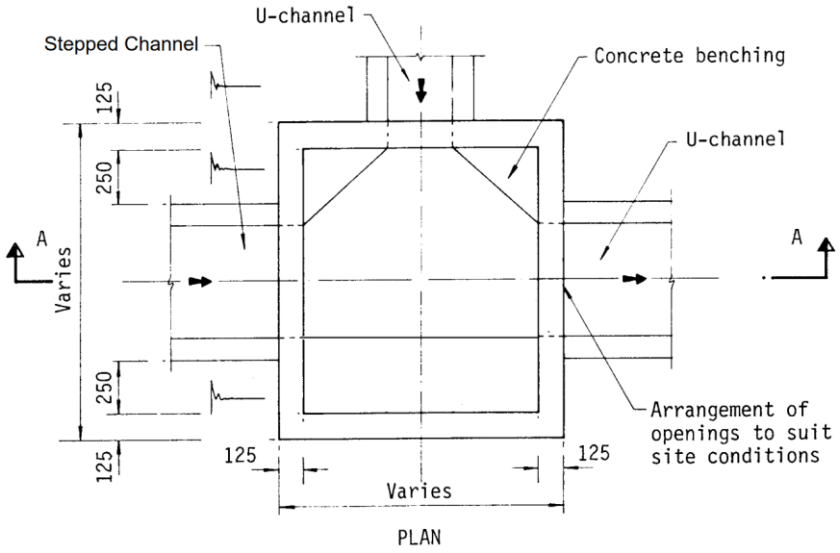
i. Drainage Services Department: "Stormwater Drainage Manual – Planning, Design and Management"

ii. Drainage Services Department: Advice Note No.1 : "Application of the Drainage Impact Assessment Process to Private Sector Projects"

Appendix A

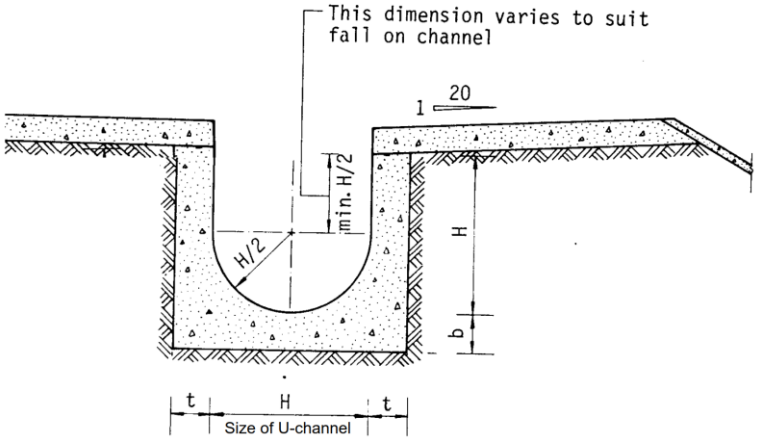


SECTION A-A



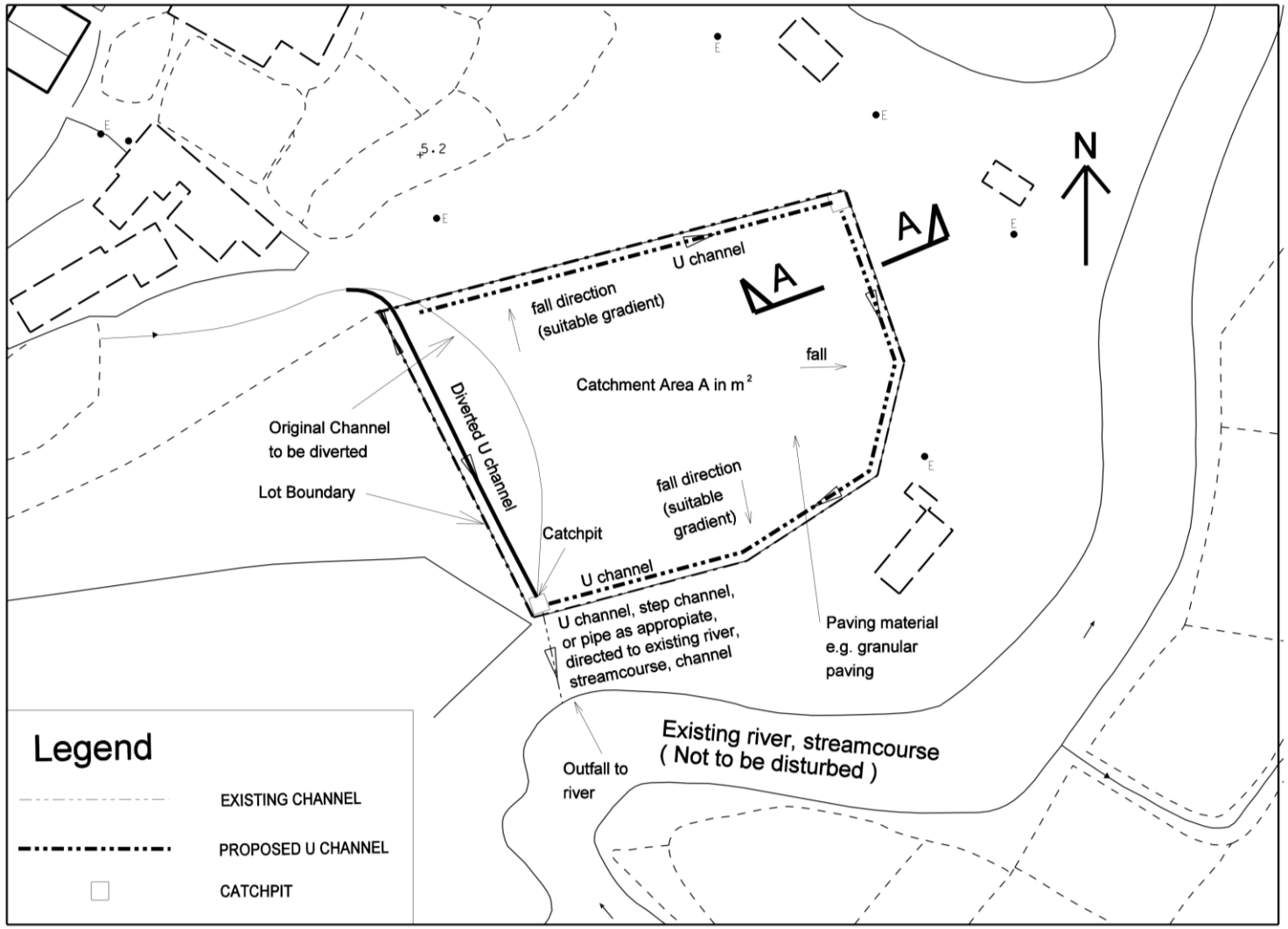
PLAN

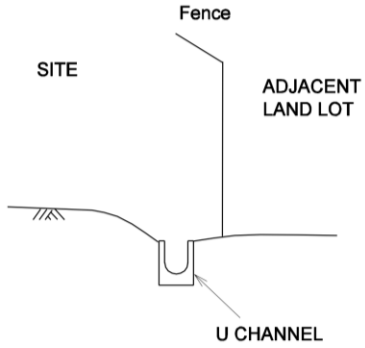
TYPICAL DETAILS OF CATCHPIT



TYPICAL DETAILS OF U-CHANNEL

Appendix B





SECTION A- A

Remarks :
1) Size depth and gradient of U Channel, and scale of drawing should be indicated

SAMPLE OF A DRAINAGE LAYOUT PLAN FOR A TYPICAL SIMPLE SITE

Appendix C

Checklist for Content of a Drainage Proposal for Simple Sites

	Items	Included?		
		Yes	No	NA
1.	**Basic Information of the Site**			
	● Location of the site			
	● Area (in m^2) of the site			
2.	**Record of Existing Stormwater Drainage System**			
	● Information of existing stormwater drains e.g. peripheral u-channel, ditch, streamcouse, etc. within and around the application site			
	● Records e.g. photos and plans showing satisfactory condition of the existing stormwater drains, if applicant make use of these existing stormwater drains as part of his proposed drainage network			
3.	**Proposed Drainage Works**			
	● Layout plan and cross-section showing –			
	➢ Topography and fall direction of the site and areas in the vicinity			
	➢ Proposed paving and formation level			
	➢ Position of buildings and structure			
	➢ Size, alignment, flow direction, invert levels, gradient and materials of existing and proposed drains			
	➢ Typical details of drainage works e.g. channel, catchpit, connections to existing drainage system, etc.			
	➢ Location of discharge point			
	● A surface channel at the periphery of the site has been provided to intercept all such rainwater falling onto the site and where relevant also from areas outside the site if the proposed drainage systems will also collect rainwater from other areas			
	● Where structures (e.g. buildings, walls or hoarding or the like) are erected, adequate opening or drainage facilities has been provided to allow existing overland flow passing through the site or to be intercepted by the drainage system of the concerned development			
	● The concerned development has not adversely affected existing natural streams, drains, ditches and the adjacent area			
	● Sand trap, terminal manhole or provision alike has been provided before the collected runoff is discharged to the public drainage facilities			
4.	**Calculations**			
	● Calculations according to the latest version of DSD Stormwater Drainage Manual showing the adequacy of the proposed drainage systems			
	● The hydraulic performance of the existing drainage facilities is not adversely affected by the concerned development			

Appendix D

Frequently Asked Questions

1. Why a drainage submission is required?

Changes in land use may cause flooding when the sites are filled or paved without suitable drainage systems. As such, the applicant is requested to make a drainage submission to demonstrate that the proposed use of the site would not have adverse drainage impacts to the area.

2. How to classify simple sites and complicated sites?

Simple sites are development sites, which are less than 1 ha in size and neither fall within flood-prone areas such as low-lying areas and flooding blackspots nor involve pond filling and substantial earth filling.

Complicated sites are sites larger than 1 ha in size, or sites adjacent to or encompassing a major stream, channel or river etc, or sites where the drainage impact of the development may be significant.

The above classification provides an indication only. The exact classification shall be determined based on the actual site condition and the site formation works involved in each individual application. Therefore, the applicant should as far as possible provide this kind of information in their application submissions.

3. What are the required drainage submissions for simple sites and complicated sites?

For simple sites, submission of a typical drainage proposal is required. For complicated sites, a drainage submission prepared in accordance with DSD Advice Note No.1 is required.

4. Who should an applicant employ to prepare a drainage submission?

In order to protect the interest of the applicant from any possible damages due to flooding caused by the proposed drainage works, it is advisable for the applicant to employ a qualified engineer (Registered Professional Engineer in the Civil Engineering discipline) to prepare for his drainage proposal for simple sites.

For complicated sites, the applicant should employ a qualified engineer (Registered Professional Engineer in the Civil Engineering discipline) to prepare for his drainage submission. The completed drainage submission should be signed and certified by the qualified engineer in charge before it is submitted to DSD.

5. What are the considerations in preparing a drainage submission?

For simple sites, the main points to be considered are listed in section 5(a) of this technical note.

For complicated sites, the applicant should refer to DSD Advice Note No. 1 for different considerations required for a comprehensive drainage impact assessment.

6. What should be included in a drainage submission?

For simple sites, typical contents of a drainage proposal are listed in section 6(a) of this technical note. A checklist is provided in Appendix C to facilitate the preparation of a drainage proposal.

For complicated sites, the applicant should refer to DSD Advice Note No. 1.

7. Who should an applicant submit the drainage submission to?

When the drainage submission is ready, the applicant should submit it to PlanD and DSD at the same time. DSD will review the submission and provide feedback to the applicant via PlanD in due course.

8. When should an applicant implement and complete the proposed drainage facilities?

Once the drainage submission is satisfactoraily accepted, the applicant should implement and complete the proposed drainage facilities according to their submission as soon as possible.

9. What should an applicant do when the proposed drainage facilities are completed on site?

When the proposed drainage facilities are completed on site, the applicant should serve a notice of completion of works (with photos showing the completed works) to PlanD and DSD at the same time. DSD will arrange inspections to check on site if they are in order. The applicant will be informed of the results of the inspections via PlanD.

10. Can an applicant operate the development site before the satisfactory completion of the inspections carried out by DSD?

In view of the increasing public expectation on flood protection, the applicant should only operate the development site after the satisfactory completion of the inspections.

11. What are the regular maintenance works required for the completed drainage facilities?

Regular maintenance such as routine desilting is essential for all drains, catchpits and streamcourses to avoid blockage and deterioration. The applicant should ensure and keep all drainage works proposed by him, after construction, under proper maintenance during occupation of the site.