Ref: DSD T 1/50/32

13 January 2017

Drainage Services Department
Technical Circular No. 1/2017

Temporary Flow Diversions and Temporary Works Affecting Capacity in Stormwater Drainage Systems

Introduction

There are many instances where works, both by DSD and others, may involve the construction of permanent or temporary works within, over or adjacent to DSD's stormwater drainage systems. During the course of these works, inadequate temporary flow diversions and/or poor temporary works design adversely affecting the flow have the potential to lead to flooding during heavy rain, with possible severe consequences.

2. This Circular provides guidance on the basic principles to be applied when assessments are made on the adequacy of proposed temporary flow diversions and/or temporary works design applicable to various periods throughout the year.

Effective Date

3. This Circular takes immediate effect.

Effect on Existing Circular

4. This Circular replaces DSD Technical Circular No. 14/2000 which is hereby cancelled. It shall be read in conjunction with DSD Practice Note ("PN") No. 1/2017 – "Design Rainfall Depth and Profile for Temporary Works within the Dry Season".

Rainfall Distribution throughout the Year

5. Hong Kong's climate includes a distinct wet season period where there is a very high risk of extreme rainfall events and a distinct dry season with a comparatively much lower risk of heavy rain. This can be seen from the chart of hourly rainfall recorded for each month of the year during the period from 1884 to 2016 as shown in **Appendix A**.

6. The chart in **Appendix A** is for general information only, but it illustrates in broad terms the following periods:

(a) wet season from April to October;
(b) whole dry season from November to the following March; and
(c) core dry season from December to the following February.

7. However, for situation where a proper analysis of risks and justification is undertaken, it may be that the designated wet and dry season periods can be adjusted to suit a particular temporary flow diversion or temporary works design.

Design of Works Affecting Drains, Channels, Nullahs and Rivers

8. When a potential drainage impact is anticipated, no matter whether the works are permanent or temporary in nature, the project proponent needs to submit a Drainage Impact Assessment (DIA) for DSD's approval. The requirements of the DIA are set out in ETWB TC(W) No. 2/2006 (for public sector projects), DSD Advice Note No. 1 (for private sector projects) and DSD Stormwater Drainage Manual (SDM).

9. For the design of temporary works affecting the hydraulic capacity of

stormwater drains and rivers and for the design of temporary flow diversion, the project proponent must include in the design submission an assessment of the risks involved which includes all relevant factors such as rainfall, location, sensitivity to flooding, consequences of flooding, risk to life and limb, and the length of time for the works. It must be demonstrated that the proposed works will not cause an unacceptable increase in level of flooding risk during the period of the temporary works or temporary flow diversion. In general, the flood protection standard as stated in SDM should be followed in carrying out the design of temporary works and temporary flow diversion. It should be noted that, in case of the proposed works being implemented during wet season and the capacity of the existing drain or river in question already falling short of the relevant flood protection standard stated in the SDM, DSD will normally take a stringent approach as to assessing whether such proposed works will cause an unacceptable increase in level of flooding risk, with a view to ensuring that the capacity of the drain or river in question will not be further diminished. Notwithstanding this, DSD in assessing acceptability of any increase in level of flooding risk may take into account relevant factors such as whether the increase in level of flooding risk can be practically and cost-effectively mitigated in a commensurate manner.

10. For the design of temporary works and temporary flow diversion in the wet season, the design rainfall depths and profiles as stated in SDM should be adopted. The rainfall intensity in the dry season is usually less than that encountered in the wet season. The guideline set out in DSD PN No. 1/2017 on estimating design rainfall depths and profiles can be followed in the dry season.

11. As well as the hydraulic design, careful consideration shall be given to the practical implications of the risks that may arise from the temporary works or temporary flow diversion proposals. For example, partial obstructions within channels, abrupt transitions or sharp changes in alignment of temporary diversions may create the potential for blockages to occur arising from floating debris during

heavy rain; increased amount of siltation, etc. Where the design of some proposals may rely upon contingency measures to quickly remove the installed temporary works from the drainage systems in order to provide sufficient flow capacity during adverse weather conditions, any such contingency measures and associated procedures shall be demonstrated to be 'fail-safe'.

Enquiries

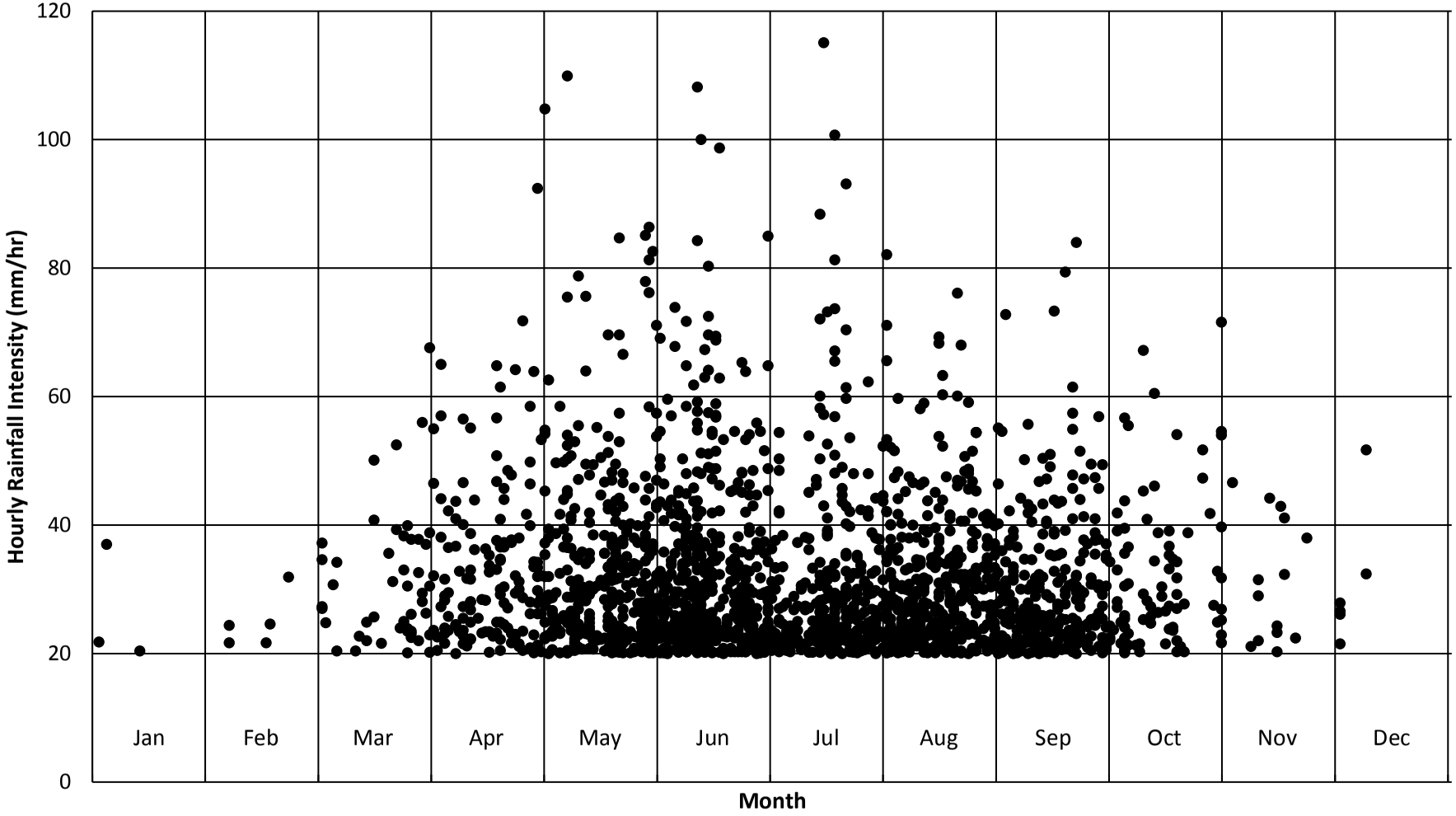
12. Enquires on this Circular should be addressed to Senior Engineer/ Drainage System Planning of the Land Drainage Division.

(Edwin K H TONG)
Director of Drainage Services

Distribution Of Rainfall Events Over the Years

(based on hourly rainfall records at the Hong Kong Observatory during 1884-1939 and 1947-March 2016)

(Notes 1 and 2)



Notes: 1. Excluding rainfall data below 20 mm/hr.
2. Based on clock-hour rainfall.

APPENDIX A