For discussion
on 27 March 2018

Legislative Council
Panel on Development

PWP Item No. 172CD (Part)
Rehabilitation of Underground Stormwater Drains

PURPOSE

This paper briefs Members on the proposal to upgrade part of **172CD**, entitled "Rehabilitation of underground stormwater drains", to Category A at an estimated cost of $122.8 million in money-of-the-day (MOD) prices for the rehabilitation of some existing stormwater drains throughout the territory.

PROJECT SCOPE

2. The part of **172CD** which we propose to upgrade to Category A, hereinafter referred to collectively as "stage 1 works", comprises –

(a) condition survey of about 35 kilometres (km) of underground stormwater drains and associated manholes distributed throughout the territory;

(b) rehabilitation of about 11 km of underground stormwater drains distributed throughout the territory; and

(c) ancillary works[1].

Site plans showing the proposed stage 1 works are at **Enclosure 1**.

3. Subject to the funding approval of the Finance Committee (FC), we plan to commence the proposed works in the fourth quarter of 2018 for completion in the fourth quarter of 2022.

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[1] Ancillary works include manhole rehabilitation, temporary closure and reinstatement of carriageways/footpaths/open space necessary for completion of the proposed works.

4. We will retain the remainder of **172CD** in Category B, which comprises condition survey of about 133 km and rehabilitation of about 30 km of underground stormwater drains throughout the territory. We will seek funding for the remainder of **172CD** at a later stage after completion of the detailed design of the remaining works.

JUSTIFICATION

5. There are about 2 400 km underground stormwater drains in Hong Kong. Routine inspection programme is in place to inspect the conditions of these drains and to carry out repair works for defective drains identified by the inspection. Since many of these drains have been in service over decades and are suffering from ageing and deterioration at an increasing rate, this routine approach is not sufficient to cope with the increasing maintenance needs of the ageing drainage network. In the past few years, there have been pipe collapse incidents resulting in road subsidence, disruptions to traffic and nuisance to public. Such incidents are expected to become more frequent as the drains age further.

6. In this regard, a consultancy study adopting a risk-based approach[2] has been conducted to assess the risks of failure of the existing underground stormwater drains. Based on the findings of the study, a territory-wide replacement and rehabilitation (R&R) programme (i.e. **172CD)** has been formulated for those pipelines accorded with high priority of R&R needs, which comprises condition survey of about 168 km of drains and rehabilitation of about 41 km of drains. The programme, comprising the investigation and R&R of aged stormwater drains, is proposed to be carried out in stages for timely identification and rehabilitation of pipelines with high risks of structural failure.

7. For the proposed stage 1 works[3] under **172CD**, we intend to install internal lining to rehabilitate about 11 km of stormwater drains that were confirmed by past inspection records to have high risks of structural failure. Trenchless rehabilitation method will generally be used to avoid road excavation works and reduce traffic impact. In addition, we will conduct condition survey for about 35 km of stormwater drains that are predicted to have high risks of structural failure but without available

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[2] Under this approach, the risks of failure of stormwater drains are prioritised with reference to the likelihood and consequence of failure, taking into account factors including age, size, depth, flow rate, structural condition, traffic disruption and environmental pollution in case of collapse.

[3] Stage 1 works comprise those pipelines with detailed design completed for early implementation of the works. The detailed design of the remaining works is in progress.

inspection records to confirm their actual structural conditions.

FINANCIAL IMPLICATIONS

8. We estimate the cost of the proposed stage 1 works to be $122.8 million in MOD prices.

PUBLIC CONSULTATION

9. We consulted 18 Committees of the District Councils during the period from November 2017 to March 2018 as listed in **Enclosure 2**. The Committees supported the proposed works.

ENVIRONMENTAL IMPLICATIONS

10. The proposed works are not designated project under the Environmental Impact Assessment Ordinance (EIAO) (Cap.499). The Drainage Services Department conducted a Preliminary Environmental Review (PER) for the proposed stage 1 works in January 2018. The PER concluded and the Director of Environmental Protection agreed that the proposed works would not have any long-term adverse environmental impacts. We have included in the project estimate of the proposed works the cost for implementation of the environmental mitigation measures.

11. For short-term environmental impacts during construction, we will control environmental nuisance to within established standards and guidelines through the implementation of appropriate pollution control measures in the contract including the use of temporary noise barriers and silenced construction equipment to reduce noise impact. We will carry out regular site inspections to ensure these pollution control measures and good site practices will be properly implemented on site.

12. At the planning and design stages, we have considered measures to reduce generation of construction waste wherever possible including the use of trenchless construction method to avoid excavation works as far as practicable. In addition, we will request the contractor to reuse inert construction waste (e.g. excavated soil) on site or in other suitable construction sites as far as possible, in order to minimise the disposal of inert construction waste to the public fill reception facilities

(PFRF)[4]. We will encourage the contractor to maximise the use of recycled or recyclable inert construction waste, and the use of non-timber formwork to further reduce the generation of construction waste.

13. At the construction stage, we will require the contractor to submit for approval a plan setting out waste management measures, which will include appropriate mitigation means to avoid, reduce, reuse and recycle inert construction waste. We will ensure that the day-to-day operations on site comply with the approved plan. We will require the contractor to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. We will control the disposal of inert and non-inert construction waste at PFRF and landfills respectively through a trip-ticket system.

14. We estimate that the proposed stage 1 works will generate 2 100 tonnes of construction waste. Of these, we will reuse 400 tonnes (19%) of inert construction waste on site, deliver 200 tonnes (10%) of inert construction waste to PFRF for subsequent reuse and 1 500 tonnes (71%) of non-inert construction waste at landfills for disposal. The total cost for disposal of construction waste at PFRF and landfill sites is estimated to be $320,000 (based on a unit charge rate of $71 per tonne for disposal at PFRF and $200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)).

HERITAGE IMPLICATIONS

15. The proposed stage 1 works will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites or buildings, sites of archaeological interest and Government historic sites identified by the Antiquities and Monuments Office.

LAND ACQUISITION

16. The proposed stage 1 works will only involve government land. No land resumption is required.

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[4] PFRF are specified in Schedule 4 of Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N). Disposal of inert construction waste in PFRF requires a licence issued by the Director of Civil Engineering and Development.

TRAFFIC IMPLICATIONS

17. We will implement temporary traffic arrangement (TTA) to maintain the traffic flow during construction and such TTA will be removed when there is no construction activity. A Traffic Impact Assessment (TIA) was conducted and the TIA concluded that the proposed stage 1 works will not cause significant traffic impact to the surrounding road network.

BACKGROUND

18. In September 2015, we upgraded **172CD** to Category B.

19. In May 2017, we engaged consultants to carry out site investigation, surveys, impact assessments and detailed design for **172CD**. The total estimated cost was $15.5 million in MOD prices. We have charged this amount to block allocation **Subhead 4100DX** "Drainage works, studies and investigations for items in Category D of the Public Works Programme". We have substantially completed the detailed design of the proposed stage 1 works mentioned in paragraph 2 above.

WAY FORWARD

20. We plan to seek funding approval from the FC for upgrading part of **172CD** to Category A after consulting the Public Works Subcommittee.

Development Bureau
Drainage Services Department
March 2018

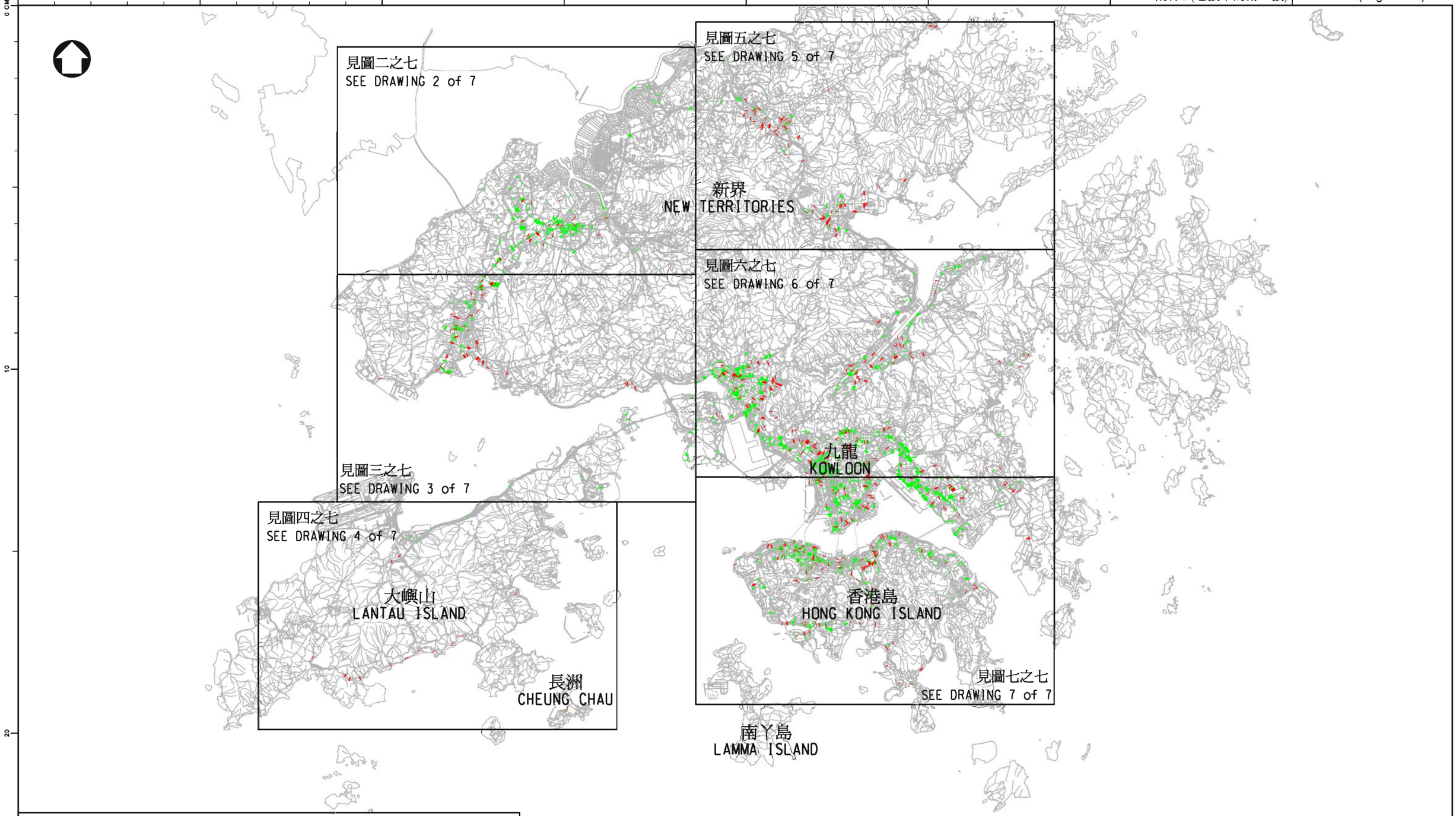

圖 例 LEGEND :

擬勘測之雨水渠 PROPOSED STORMWATER DRAINS FOR CONDITION SURVEY

擬修復之雨水渠 PROPOSED STORMWATER DRAINS FOR REHABILITATION

版 no.	日期 date	修改項目 description	簡簽 initial

圖則名稱 drawing title

工務計劃項目第172CD號 –
地下雨水渠修復工程 - 第1階段 (圖一之七)
PWP ITEM NO.172CD –
REHABILITATION OF UNDERGROUND STORMWATER DRAINS – STAGE 1 (DRAWING 1 OF 7)

繪畫 drawn	SIGNED H.Y. LEE	日期 date 14 MAR 2018	圖則編號 drawing no. DPM/4172CD/1004
核對 checked	SIGNED K.Y. CHEN	日期 date 14 MAR 2018	比例 scale 1:200000
批核 approved	SIGNED K.W. FUNG	日期 date 14 MAR 2018	
部門 office	工程管理部 PROJECT MANAGEMENT DIVISION		

香港特別行政區政府渠務署
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

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新田
SAN TIN

米埔
MAI PO

天水圍
TIN SHUI WAI

元朗
YUEN LONG

圖例 LEGEND :

擬勘測之雨水渠 PROPOSED STORMWATER DRAINS FOR CONDITION SURVEY

擬修復之雨水渠 PROPOSED STORMWATER DRAINS FOR REHABILITATION

圖則名稱 drawing title

工務計劃項目第172CD號 –
地下雨水渠修復工程 - 第1階段 (圖二之七)
PWP ITEM NO.172CD –
REHABILITATION OF UNDERGROUND STORMWATER DRAINS - STAGE 1 (DRAWING 2 OF 7)

版 no.	日期 date	修改項目 description	簡簽 initial

繪畫 drawn	SIGNED K.S. LEUNG	日期 date 12 MAR 2018	
核對 checked	SIGNED K.Y. CHEN	日期 date 12 MAR 2018	
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部門 office	工程管理部 PROJECT MANAGEMENT DIVISION		

圖則編號 drawing no. DPM/4172CD/1005

比例 scale 1:50000

香港特別行政區政府渠務署
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE
HONG KONG
SPECIAL ADMINISTRATIVE REGION

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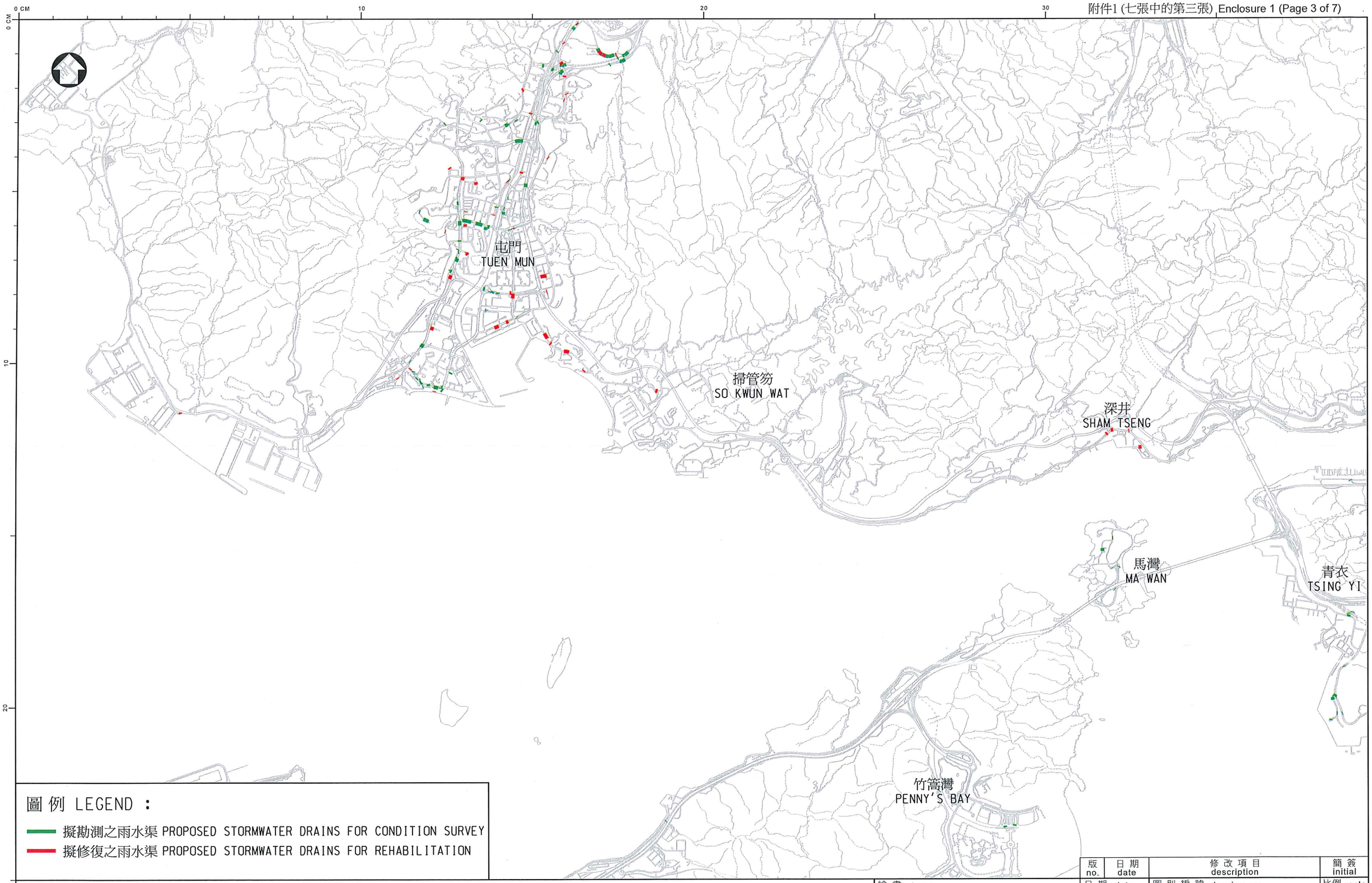

圖例 LEGEND :

擬勘測之雨水渠 PROPOSED STORMWATER DRAINS FOR CONDITION SURVEY

擬修復之雨水渠 PROPOSED STORMWATER DRAINS FOR REHABILITATION

版 no.	日期 date	修改項目 description	簡簽 initial

圖則名稱 drawing title

工務計劃項目第172CD號 –
地下雨水渠修復工程 - 第1階段 (圖三之七)
PWP ITEM NO.172CD –
REHABILITATION OF UNDERGROUND STORMWATER DRAINS – STAGE 1 (DRAWING 3 OF 7)

繪畫 drawn	SIGNED K.S. LEUNG	日期 date 12 MAR 2018
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批核 approved	SIGNED K.W. FUNG	日期 date 12 MAR 2018
部門 office	工程管理部 PROJECT MANAGEMENT DIVISION	

圖則編號 drawing no. DPM/4172CD/1006

比例 scale 1:50000

香港特別行政區政府渠務署
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE
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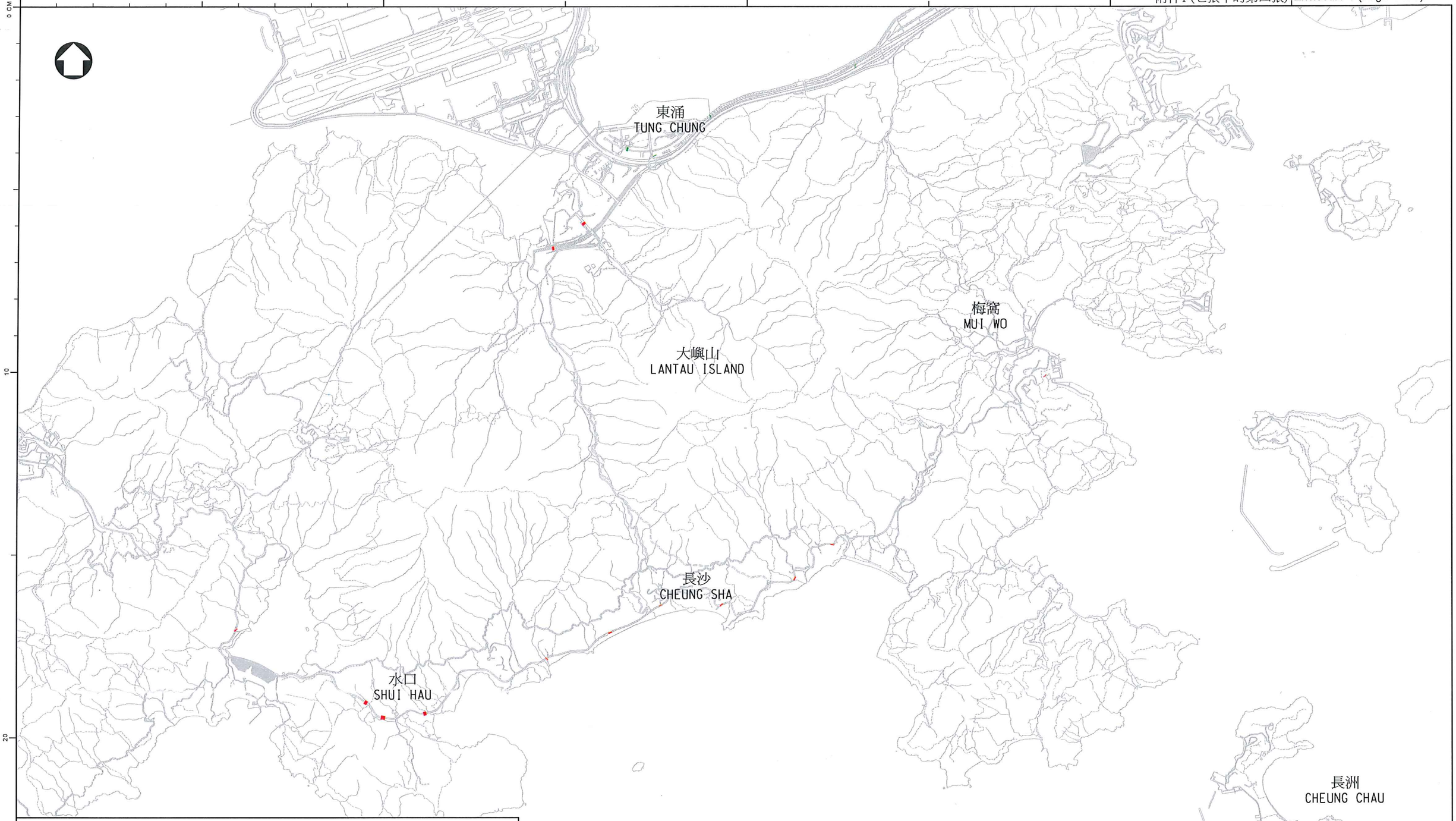

圖 例 LEGEND :

擬勘測之雨水渠 PROPOSED STORMWATER DRAINS FOR CONDITION SURVEY

擬修復之雨水渠 PROPOSED STORMWATER DRAINS FOR REHABILITATION

版 no.	日 期 date	修 改 項 目 description	簡 簽 initial

圖則名稱 drawing title

工務計劃項目第172CD號 –
地下雨水渠修復工程 - 第1階段 (圖四之七)
PWP ITEM NO.172CD –
REHABILITATION OF UNDERGROUND STORMWATER DRAINS - STAGE 1 (DRAWING 4 OF 7)

繪畫 drawn	SIGNED K.S. LEUNG	日 期 date 12 MAR 2018
核對 checked	SIGNED K.Y. CHEN	日 期 date 12 MAR 2018
批核 approved	SIGNED K.W. FUNG	日 期 date 12 MAR 2018
部門 office	工 程 管 理 部 PROJECT MANAGEMENT DIVISION	

圖則編號 drawing no. DPM/4172CD/1007

比例 scale 1:50000

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DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE
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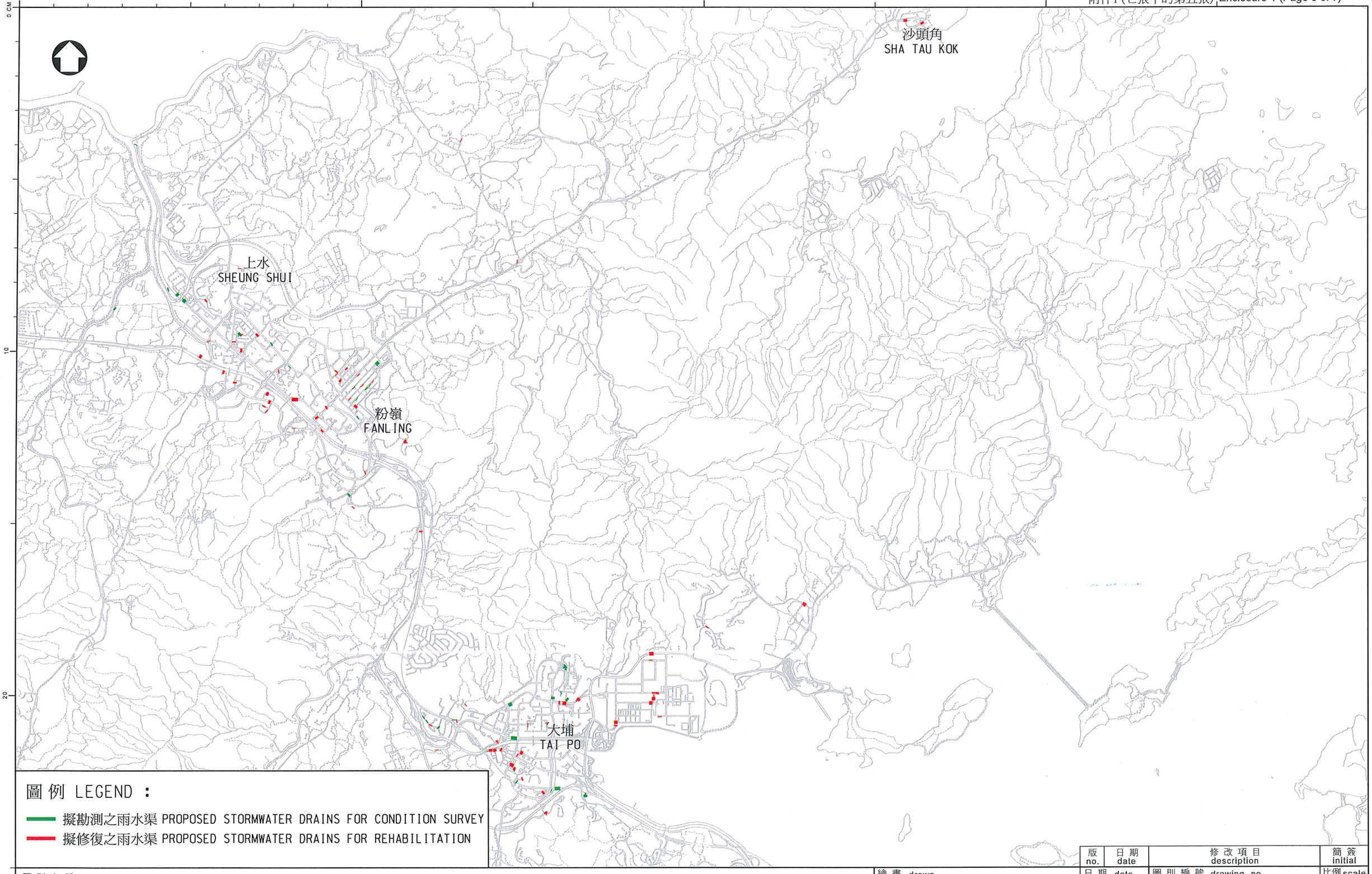

圖 例 LEGEND :

擬勘測之雨水渠 PROPOSED STORMWATER DRAINS FOR CONDITION SURVEY

擬修復之雨水渠 PROPOSED STORMWATER DRAINS FOR REHABILITATION

版 no.	日 期 date	修 改 項 目 description	簡 簽 initial

圖 則 名 稱 drawing title

工務計劃項目第172CD號 –
地下雨水渠修復工程 - 第1階段 (圖五之七)
PWP ITEM NO.172CD –
REHABILITATION OF UNDERGROUND STORMWATER DRAINS - STAGE 1 (DRAWING 5 OF 7)

繪 畫 drawn	*SIGNED* K.S. LEUNG	日 期 date 12 MAR 2018
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批 核 approved	*SIGNED* K.W. FUNG	日 期 date 12 MAR 2018
部 門 office	工 程 管 理 部 PROJECT MANAGEMENT DIVISION	

圖 則 編 號 drawing no. DPM/4172CD/1008

比例 scale 1:50000

香港特別行政區政府渠務署
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GOVERNMENT OF THE
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圖 例 LEGEND :

擬勘測之雨水渠 PROPOSED STORMWATER DRAINS FOR CONDITION SURVEY

擬修復之雨水渠 PROPOSED STORMWATER DRAINS FOR REHABILITATION

馬鞍山
MA ON SHAN

沙田
SHA TIN

西貢
SAI KUNG

葵涌
KWAI CHUNG

荃灣
TSUEN WAN

青衣
TSING YI

長沙灣
CHEUNG SHA WAN

九龍塘
KOWLOON TONG

九龍灣
KOWLOON BAY

圖則名稱 drawing title

工務計劃項目第172CD號 –
地下雨水渠修復工程 - 第1階段 (圖六之七)
PWP ITEM NO.172CD -
REHABILITATION OF UNDERGROUND STORMWATER DRAINS - STAGE 1 (DRAWING 6 OF 7)

繪畫 drawn	*SIGNED* K.S. LEUNG	日期 date 12 MAR 2018
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批核 approved	*SIGNED* K.W. FUNG	日期 date 12 MAR 2018
部門 office	工程管理部 PROJECT MANAGEMENT DIVISION	

版 no.	日期 date	修改項目 description	簡簽 initial

圖則編號 drawing no. DPM/4172CD/1009

比例 scale 1:50000

香港特別行政區政府渠務署
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE
HONG KONG
SPECIAL ADMINISTRATIVE REGION

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油麻地
YAU MA TEI

土瓜灣
TO KWA WAN

觀塘
KWUN TONG

將軍澳
TSEUNG KWAN O

尖沙咀
TSIM SHA TSUI

北角
NORTH POINT

西灣
SAI WAN

中灣
CENTRAL

灣仔
WAN CHAI

西灣河
SAI WAN HO

薄扶林
POK FU LAM

柴灣
CHAI WAN

香港島
HONG KONG ISLAND

香港仔
ABERDEEN

鴨脷洲
AP LEI CHAU

淺水灣
REPULSE BAY

赤柱
STANLEY

圖 例 LEGEND :

擬勘測之雨水渠 PROPOSED STORMWATER DRAINS FOR CONDITION SURVEY

擬修復之雨水渠 PROPOSED STORMWATER DRAINS FOR REHABILITATION

圖則名稱 drawing title

工務計劃項目第172CD號 –
地下雨水渠修復工程 - 第1階段 (圖七之七)
PWP ITEM NO.172CD –
REHABILITATION OF UNDERGROUND STORMWATER DRAINS - STAGE 1 (DRAWING 7 OF 7)

版 no.	日期 date	修改項目 description	簡簽 initial

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部門 office 工程管理部
PROJECT MANAGEMENT DIVISION

圖則編號 drawing no. DPM/4172CD/1010

比例 scale 1:50000

香港特別行政區政府渠務署
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

PWP Item No. 172CD (Part)
Rehabilitation of Underground Stormwater Drains

Consultation with District Councils

Date	District Council	Committee
27 November 2017	Southern	District Development and Housing Committee
30 November 2017	Sham Shui Po	Environment and Hygiene Committee
5 December 2017	Eastern	Planning, Works and Housing Committee
12 December 2017	Wan Chai	Development, Planning & Transport Committee
19 December 2017	Wong Tai Sin	Food and Environmental Hygiene Committee
4 January 2018	Tsuen Wan	Environmental and Health Affairs Committee
10 January 2018	Tai Po	Environment, Housing and Works Committee
11 January 2018	Sai Kung	Housing and Environmental Hygiene Committee
11 January 2018	Sha Tin	Health and Environment Committee
15 January 2018	North	District Minor Works and Environmental Improvement Committee
18 January 2018	Yau Tsim Mong	Food, Environmental Hygiene and Public Works Committee
18 January 2018	Kowloon City	Housing and Infrastructure Committee
19 January 2018	Tuen Mun	Environment, Hygiene and District Development Committee
22 January 2018	Yuen Long	Environmental Improvement Committee

Date	District Council	Committee
29 January 2018	Islands	Tourism, Agriculture, Fisheries and Environmental Hygiene Committee
30 January 2018	Kwun Tong	Environment and Hygiene Committee
20 February 2018	Kwai Tsing	Planning and District Facilities Management Committee
15 March 2018	Central and Western	Food, Environment, Hygiene and Works Committee