

## **ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE**

### **HEAD 704 – DRAINAGE**

#### **Civil Engineering – Drainage and erosion protection**

#### **172CD – Rehabilitation of underground stormwater drains**

Members are invited to recommend to the Finance Committee the upgrading of **172CD**, entitled “Rehabilitation of underground stormwater drains – remaining works”, to Category A at an estimated cost of \$702.7 million in money-of-the-day (MOD) prices.

### **PROBLEM**

We need to rehabilitate the ageing underground stormwater drains in Central & Western District, Wan Chai District, Eastern District, Southern District, Islands District, Tuen Mun District, Yuen Long District, North District, Tai Po District, Sha Tin District, Kwun Tong District and Sai Kung District (the 12 Districts) with a view to reducing the risk associated with the collapse of drains.

### **PROPOSAL**

2. The Director of Drainage Services, with the support of the Secretary for Development, proposes to upgrade **172CD** to Category A at an estimated cost of \$702.7 million in MOD prices, which involves rehabilitation works for underground stormwater drains with high risk associated with the collapse of these drains in the 12 Districts.

**/PROJECT .....**

## PROJECT SCOPE AND NATURE

3. The proposed scope of works under **172CD** comprises –
- (a) rehabilitation of a total of about 19 kilometres (km) of underground stormwater drains and the associated manholes in the 12 Districts; and
  - (b) ancillary works<sup>1</sup>.
4. Plans showing the locations of the proposed works are at Enclosure 1.
5. We plan to commence the proposed works upon obtaining funding approval from the Finance Committee for target completion of the works in around five years.

## JUSTIFICATION

6. There are about 2 400 km of underground stormwater drains in Hong Kong. We conduct regular inspection and maintenance of these stormwater drains, and repair the ones with defects. As many of these stormwater drains have been in service for years and are suffering from ageing and deterioration at an increasing rate, it is necessary to ensure that defects can be timely detected and thoroughly rectified. In the past few years, there have been incidents of ageing pipe collapses, resulting in road subsidence and hence disruptions to traffic and nuisance to the public. With the stormwater drains ageing further, such incidents are expected to become more frequent if defects cannot be timely rectified.

7. In 2015, the “Enhanced Management of Underground Sewer and Drain Networks - Feasibility Study” (the Study) evaluated the risks of failure of the existing underground stormwater drains. It also categorised the underground stormwater drains according to their condition and risk of structural failure. Based on the information obtained, we formulated a territory-wide replacement and rehabilitation (R&R) programme. Details of the R&R programme are outlined at Enclosure 2.

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<sup>1</sup> Ancillary works include temporary closure and reinstatement of carriageways/footpaths/open space, etc.

8. The proposed works under **172CD** include the rehabilitation of a total of about 19 km of underground stormwater drains in the 12 Districts, which have been confirmed by previous inspections as having high risk of structural failure. We will adopt trenchless technologies in carrying out the rehabilitation works as far as possible, which comprise installation of internal lining in the drains with various methods, with a view to reducing the need of road excavation works and impact on road traffic.

9. Other than the above proposed works and other on-going works, we will continue to schedule regular inspection plans to monitor the conditions of underground stormwater drains throughout the territory and review the respective R&R needs according to the prevailing conditions of stormwater drains.

## FINANCIAL IMPLICATIONS

10. We estimate the capital cost of the proposed works to be \$702.7 million in MOD prices (please see paragraph 12 below), broken down as follows –

		\$ million (in MOD prices)
(a)	Rehabilitation of stormwater drains	550.4
(b)	Ancillary works	5.9
(c)	Environmental mitigation measures	2.4
(d)	Consultants' fees for	3.8
	(i) contract administration	2.4
	(ii) management of resident site staff (RSS)	1.4
(e)	Remuneration of RSS	76.4
(f)	Contingencies	63.8
		<hr/>
	Total	<hr/> 702.7 <hr/>

11. We propose to engage consultants to undertake contract administration and site supervision of the project. A detailed breakdown of the estimates for the consultants' fees and RSS costs by man-months is at Enclosure 3.

12. Subject to funding approval, we plan to phase the expenditure as follows –

<b>Year</b>	<b>\$ million (in MOD prices)</b>
2021 – 2022	30.0
2022 – 2023	86.5
2023 – 2024	143.8
2024 - 2025	151.5
2025 – 2026	189.5
2026 – 2027	34.2
2027 – 2028	33.7
2028 – 2029	33.5
	<hr/>
	702.7
	<hr/>

13. We have derived the MOD estimates on the basis of the Government's latest set of assumptions on the trend rate of change in the prices of public sector building and construction output for the period from 2021 to 2029. We will deliver the proposed works under a New Engineering Contract (NEC)<sup>2</sup> form of contract with provision for price adjustment.

14. We estimate the additional annual recurrent expenditure arising from the proposed project to be \$1.61 million.

/PUBLIC .....

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<sup>2</sup> NEC is a suite of contracts developed by the Institution of Civil Engineers, United Kingdom. It is a contract form that emphasises cooperation, mutual trust and collaborative risk management between contracting parties.



## PUBLIC CONSULTATION

15. We consulted the committees of the relevant District Councils between May 2020 and September 2020, as listed at Enclosure 4. Members of the committees had no objection to the proposed works.

16. We consulted the Legislative Council Panel on Development on 24 November 2020 and Members supported the project.

## ENVIRONMENTAL IMPLICATIONS

17. The project is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). The Drainage Services Department completed a Preliminary Environmental Review (PER) for the proposed works in September 2020. 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 paragraph 10(c) above a sum of \$2.4 million (in MOD prices) in the project estimate for implementation of the environmental mitigation measures.

18. For short-term environmental impacts during construction, we will minimise environmental nuisance to meet with established standards and guidelines through the implementation of appropriate mitigation measures stipulated in the contract. These measures include the use of temporary noise barriers and silenced construction equipment, water-spraying to the construction site and on-site treatment of site run-off. We will also carry out regular site inspections to ensure these measures and good site practices are properly implemented on site.

19. At the planning and design stages, we have considered measures to reduce generation of construction waste where possible including the use of trenchless rehabilitation techniques to reduce excavation works. In addition, we will require 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 at the public fill reception facilities (PFRF)<sup>3</sup>. 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.

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<sup>3</sup> PFRF are specified in Schedule 4 of Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N). Disposal of inert construction waste at PFRF requires a licence issued by the Director of Civil Engineering and Development.

20. 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 also require the contractor to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. We will monitor the disposal of inert and non-inert construction waste at PFRF and landfills respectively through a trip-ticket system.

21. We estimate that the proposed works will generate a total of about 10 610 tonnes of construction waste. Of these, we will reuse about 6 520 tonnes (61.5%) of inert construction waste on site and deliver about 2 590 tonnes (24.4%) of inert construction waste to PFRF for subsequent reuse. We will dispose of the remaining 1 500 tonnes (14.1%) of non-inert construction waste at landfills. The total cost for disposal of construction waste at PFRF and landfill sites is estimated to be \$484,000 for the proposed works (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**

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

## **LAND ACQUISITION**

23. The proposed works will only involve government land. No land resumption is required.

## **TRAFFIC IMPLICATIONS**

24. We have conducted a traffic impact assessment (TIA) for the proposed works. The TIA indicated that the proposed works will not cause significant traffic impact to the surrounding road network during construction when suitable temporary traffic arrangements (TTAs) are implemented. We will establish a traffic management liaison group to discuss, scrutinise and review the TTAs proposed by the contractors with a view to minimising traffic impact arising from the proposed works. In addition, we will set up a telephone hotline to respond to public enquiries or complaints.

**/BACKGROUND .....**

**BACKGROUND INFORMATION**

25. In September 2015, we upgraded **172CD** to Category B.
26. In June 2018, we upgraded part of **172CD** to Category A as **180CD** “Rehabilitation of underground stormwater drains - stage 1” at an approved project estimate of \$122.8 million in MOD prices for implementing part of the rehabilitation works throughout the territory. The stage 1 works commenced in January 2019 for completion by 2022.
27. In June 2020, we upgraded another part of **172CD** to Category A as **186CD** “Rehabilitation of underground stormwater drains - stage 2” at an approved project estimate of \$515.1 million in MOD prices for implementing the rehabilitation works of the ageing underground stormwater drains in Tsuen Wan, Kwai Tsing, Sham Shui Po, Yau Tsim Mong, Kowloon City and Wong Tai Sin Districts. The stage 2 works commenced in September 2020 for completion by 2025.
28. We have substantially completed the detailed design of the proposed works mentioned in paragraph 3 above.
29. The proposed works will not involve any tree removal or planting proposals.
30. We estimate that the proposed works will create about 100 jobs (80 for labourers and 20 for professional or technical staff), providing a total employment of 5 000 man-months.

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Development Bureau  
December 2020

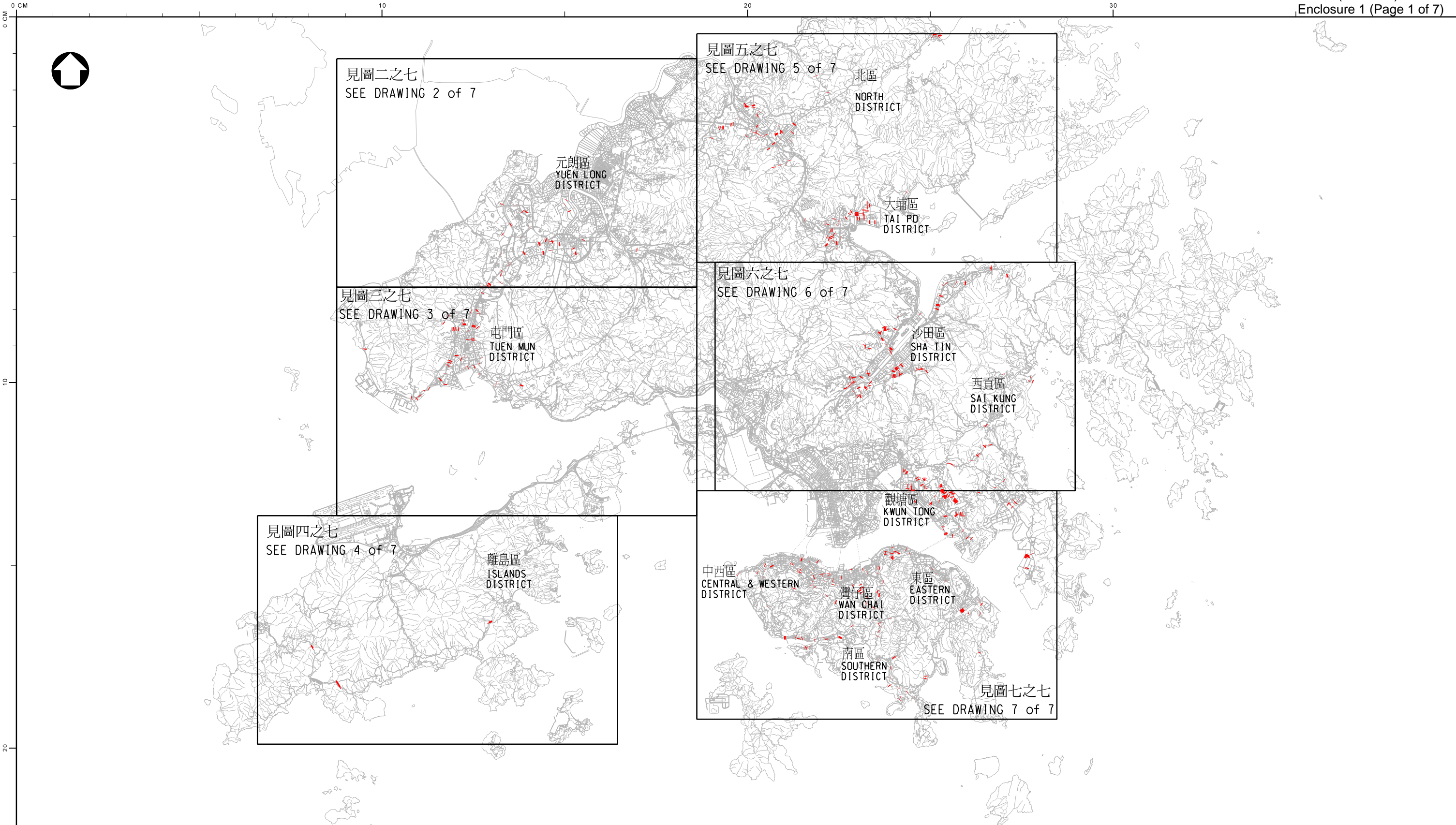


圖 例 LEGEND :

— 擬修復之雨水渠 PROPOSED STORMWATER DRAINS FOR REHABILITATION

圖 則 名 稱 drawing title

172CD號工程計劃  
地下雨水渠修復工程 - 餘下工程 (圖一之七)  
PWP ITEM NO.172CD  
REHABILITATION OF UNDERGROUND STORMWATER DRAINS - REMAINING WORKS (DRAWING 1 OF 7)

繪 畫 drawn

*SIGNED* H.Y. LEE

核 對 checked

*SIGNED* C.H. LEE

批 核 approved

*SIGNED* K.W. FUNG

部 門 office

工 程 管 理 部  
PROJECT MANAGEMENT DIVISION

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14 SEP 2020

14 SEP 2020

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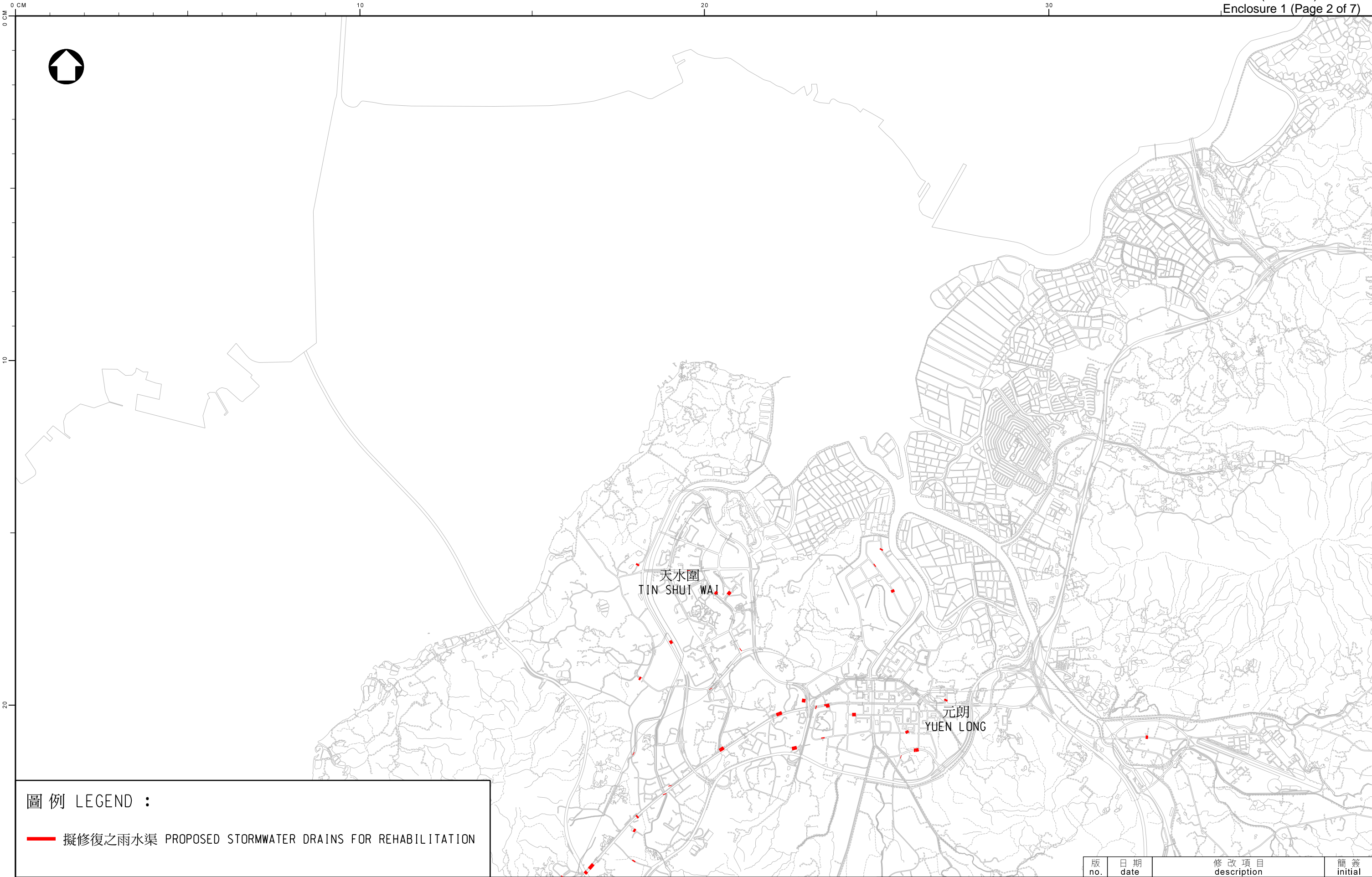



圖 例 LEGEND :

— 擬修復之雨水渠 PROPOSED STORMWATER DRAINS FOR REHABILITATION

圖 則 名 稱 drawing title

172CD號工程計劃  
地下雨水渠修復工程 - 餘下工程 (圖二之七)  
PWP ITEM NO.172CD  
REHABILITATION OF UNDERGROUND STORMWATER DRAINS - REMAINING WORKS (DRAWING 2 OF 7)

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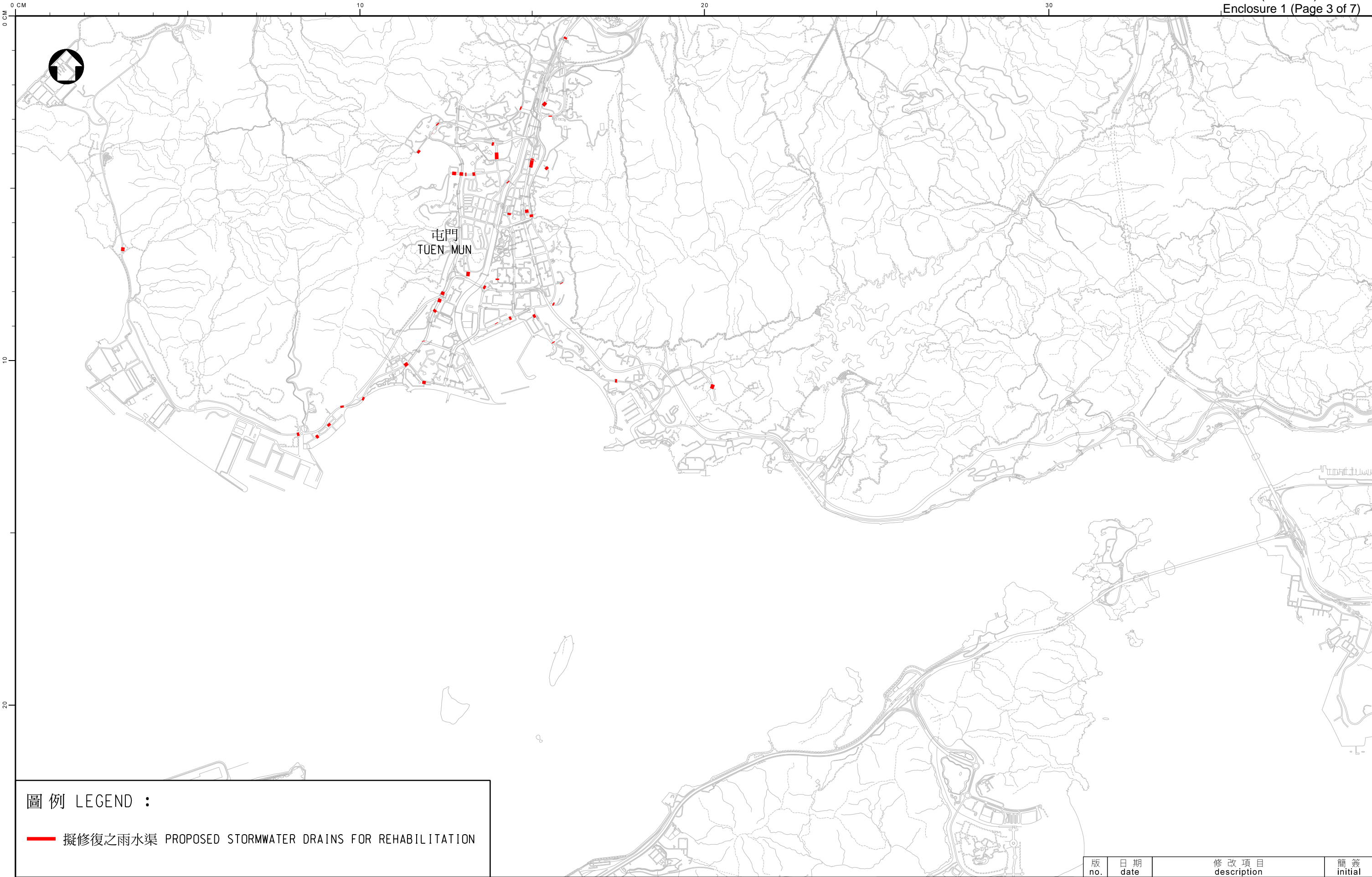



圖 例 LEGEND :

擬修復之雨水渠 PROPOSED STORMWATER DRAINS FOR REHABILITATION

圖 則 名 稱 drawing title  
172CD號工程計劃  
地下雨水渠修復工程 - 餘下工程 (圖三之七)  
PWP ITEM NO.172CD  
REHABILITATION OF UNDERGROUND STORMWATER DRAINS - REMAINING WORKS (DRAWING 3 OF 7)

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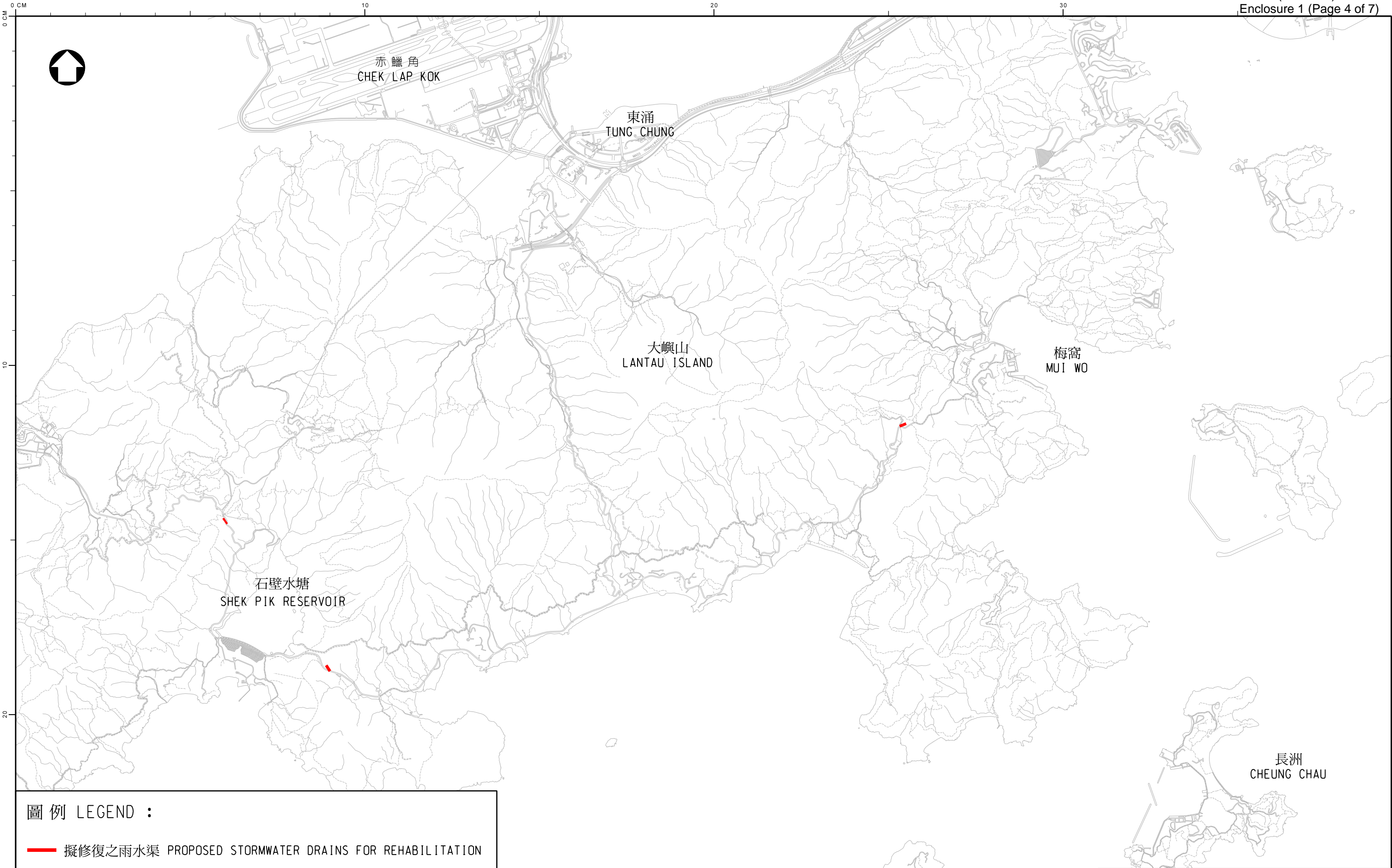




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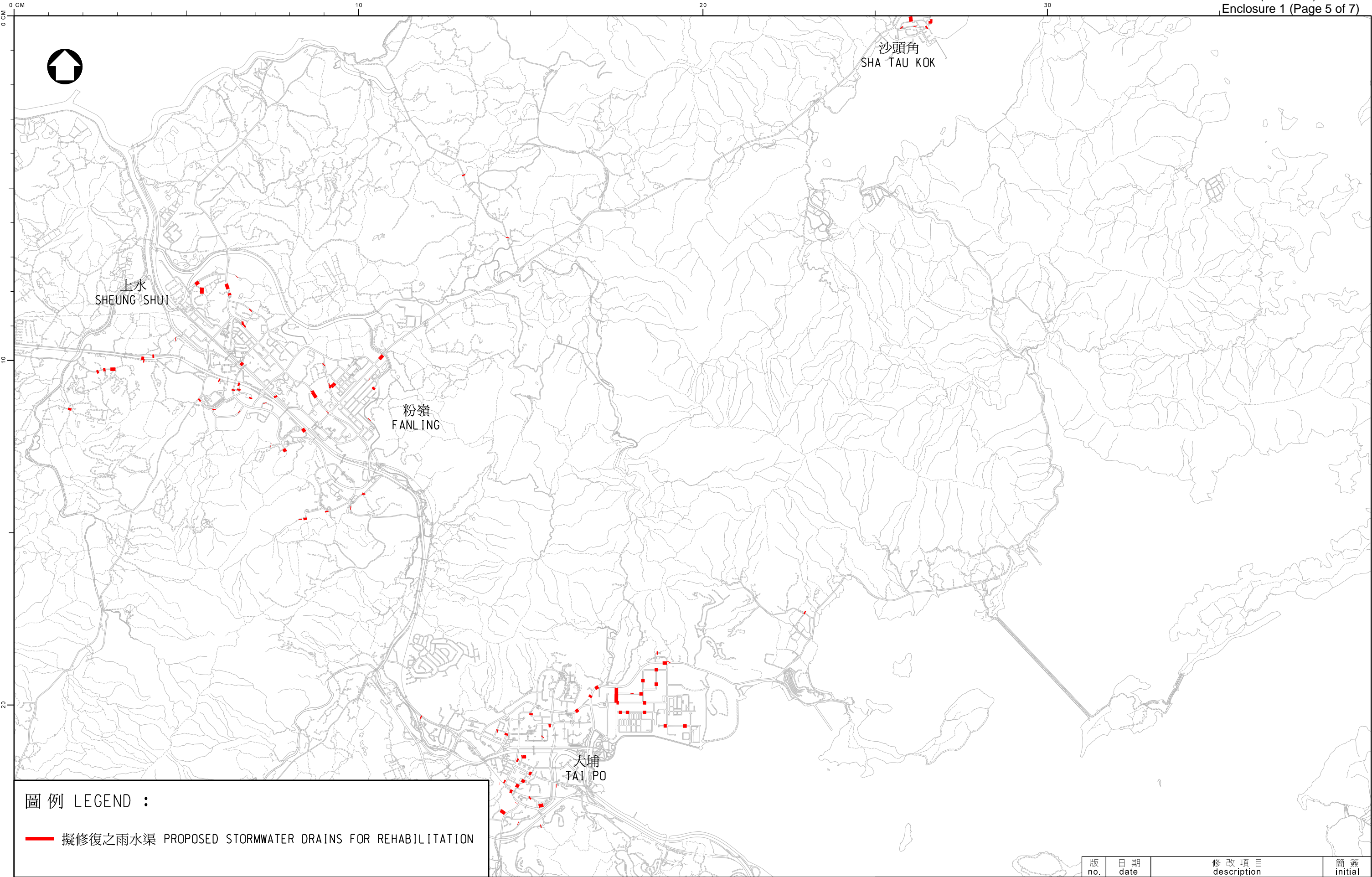
— 擬修復之雨水渠 PROPOSED STORMWATER DRAINS FOR REHABILITATION

圖 則 名 稱 drawing title

172CD號工程計劃  
地下雨水渠修復工程 - 餘下工程 (圖四之七)  
PWP ITEM NO.172CD  
REHABILITATION OF UNDERGROUND STORMWATER DRAINS - REMAINING WORKS (DRAWING 4 OF 7)

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圖例 LEGEND :

— 擬修復之雨水渠 PROPOSED STORMWATER DRAINS FOR REHABILITATION

圖則名稱 drawing title

172CD號工程計劃  
地下雨水渠修復工程 - 餘下工程 (圖五之七)  
PWP ITEM NO.172CD  
REHABILITATION OF UNDERGROUND STORMWATER DRAINS - REMAINING WORKS (DRAWING 5 OF 7)

繪畫 drawn

SIGNED H.Y. LEE

核對 checked

SIGNED C.H. LEE

批核 approved

SIGNED K.W. FUNG

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工程管理部  
PROJECT MANAGEMENT DIVISION

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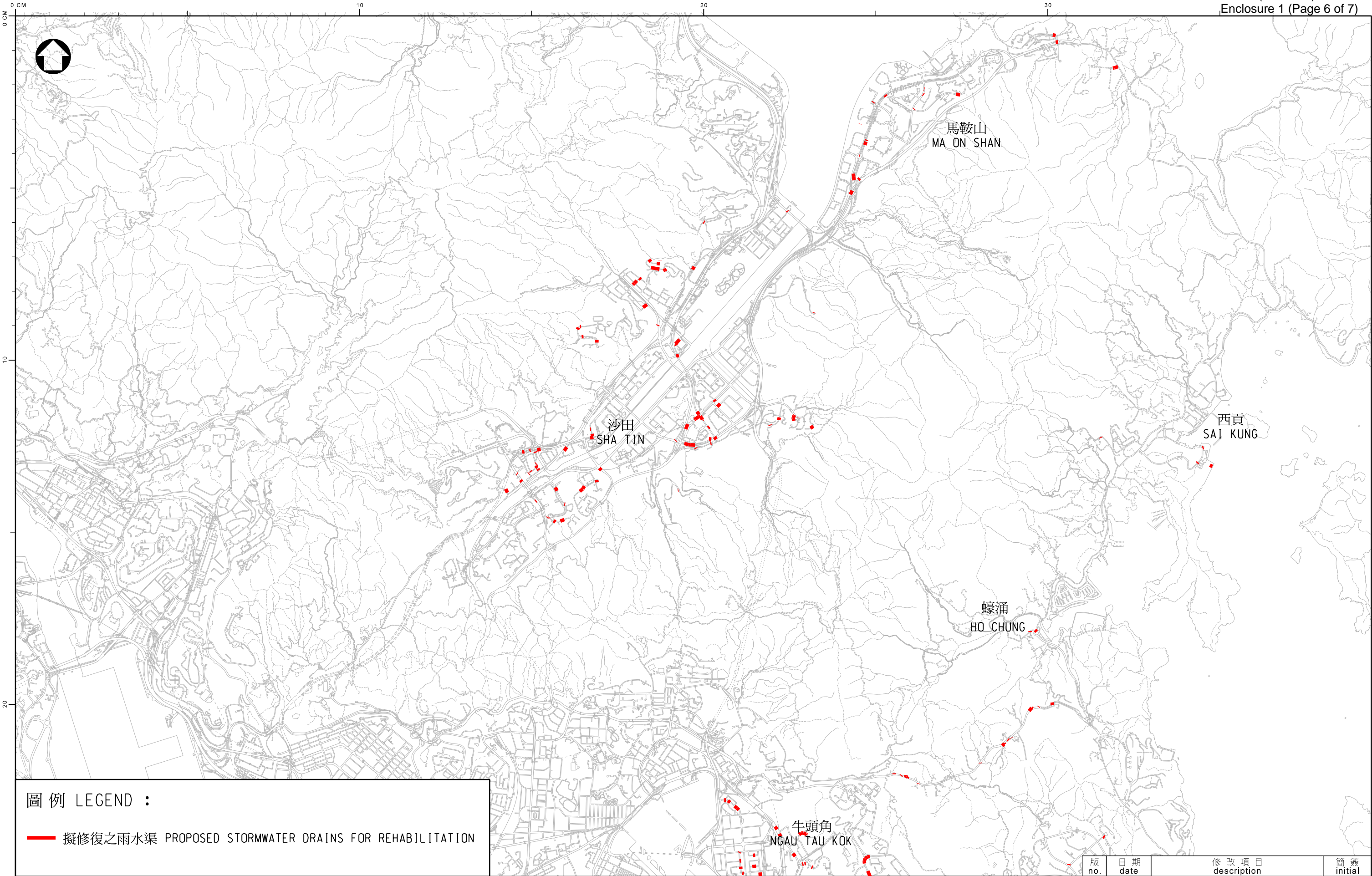


圖 例 LEGEND :

—— 擬修復之雨水渠 PROPOSED STORMWATER DRAINS FOR REHABILITATION

圖 則 名 稱 drawing title

172CD號工程計劃  
地下雨水渠修復工程 - 餘下工程 (圖六之七)  
PWP ITEM NO.172CD  
REHABILITATION OF UNDERGROUND STORMWATER DRAINS - REMAINING WORKS (DRAWING 6 OF 7)

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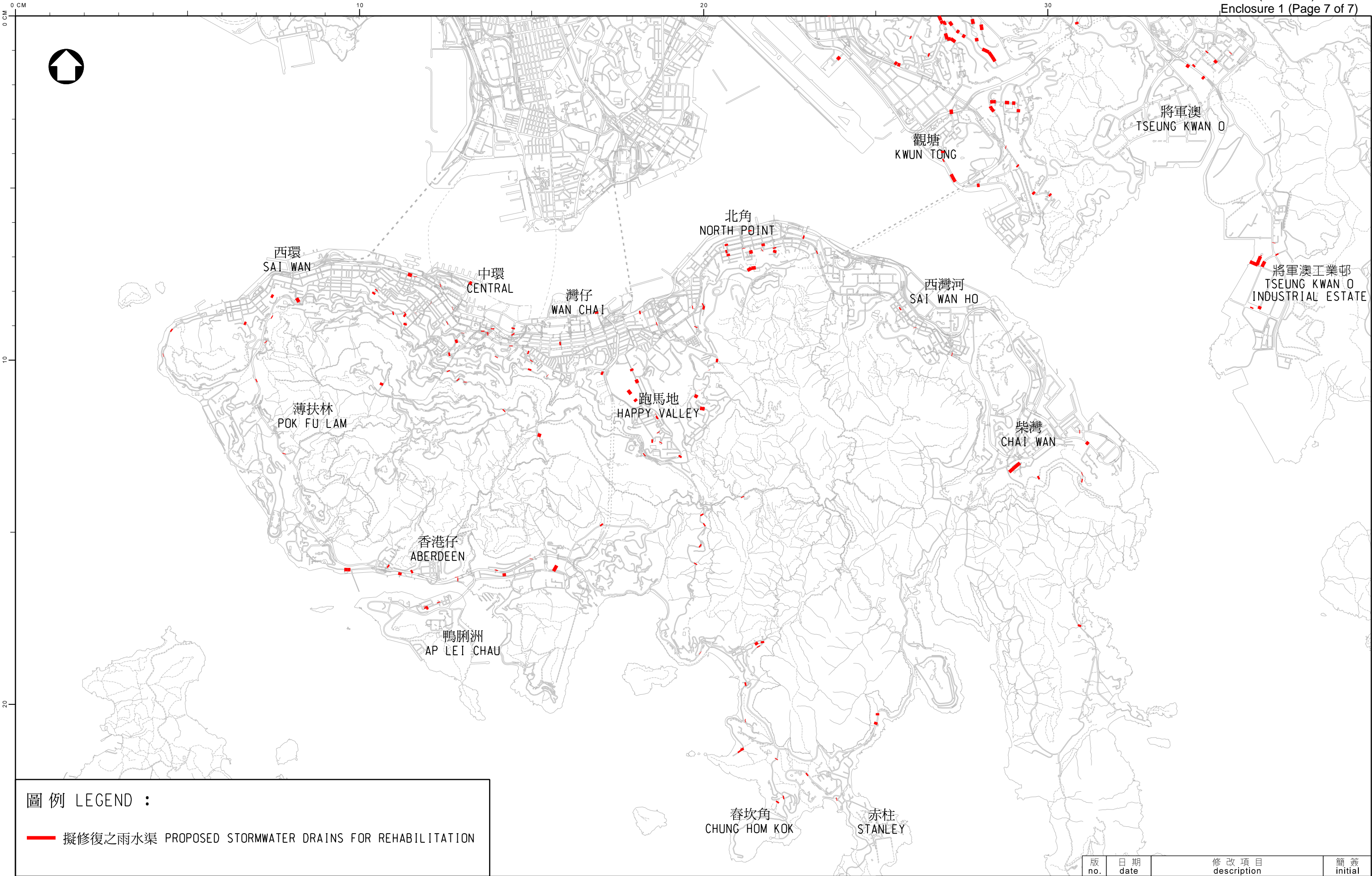


圖 例 LEGEND :

— 擬修復之雨水渠 PROPOSED STORMWATER DRAINS FOR REHABILITATION

圖 則 名 稱 drawing title
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地下雨水渠修復工程 - 餘下工程 (圖七之七)
PWP ITEM NO.172CD
REHABILITATION OF UNDERGROUND STORMWATER DRAINS - REMAINING WORKS (DRAWING 7 OF 7)

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## 172CD – Rehabilitation of underground stormwater drains

Territory-wide Replacement and Rehabilitation Programme for Stormwater Drains<sup>1</sup>

Works Package	Scope of Replacement and Rehabilitation (R&R) Works
<b>180CD -</b> “Rehabilitation of underground stormwater drains - stage 1” [On-going]	<ul style="list-style-type: none"> <li>• Condition surveys of 35 km of stormwater drains in various areas of the territory</li> <li>• Rehabilitation of 11 km of stormwater drains in various areas of the territory</li> </ul>
<b>186CD -</b> “Rehabilitation of underground stormwater drains – stage 2” [On-going]	<ul style="list-style-type: none"> <li>• Condition surveys of 55 km of stormwater drains in six district<sup>#</sup></li> <li>• Rehabilitation of 11 km of stormwater drains in six district<sup>#</sup></li> </ul> <p><sup>#</sup> Tsuen Wan, Kwai Tsing, Sham Shui Po, Yau Tsim Mong, Kowloon City and Wong Tai Sin districts</p>
<b>172CD -</b> “Rehabilitation of underground stormwater drains – remaining works” [Proposed]	<ul style="list-style-type: none"> <li>• Rehabilitation of 19 km of stormwater drains in the other 12 districts, Central &amp; Western, Wan Chai, Eastern, Southern, Islands, Tuen Mun, Yuen Long, North, Tai Po, Sha Tin, Kwun Tong and Sai Kung districts</li> </ul>
R&R works being carried out by maintenance teams of Drainage Services Department [On-going]	<ul style="list-style-type: none"> <li>• Condition surveys of 156 km of stormwater drains in various areas of the territory</li> <li>• Replacement and rehabilitation of 30 km of stormwater drains in various areas of the territory</li> </ul>
Other R&R Works under planning	<ul style="list-style-type: none"> <li>• Replacement and rehabilitation of stormwater drains confirmed by condition surveys to have high risk of structural failure</li> </ul>

<sup>1</sup> Proposed works under the Territory-wide Replacement and Rehabilitation Programme for Stormwater Drains are based on the evaluation results of the “Enhanced Management of Underground Sewer and Drain Networks – Feasibility Study” in 2015 and latest scope of R&R works.

**172CD – Rehabilitation of underground stormwater drains****Breakdown of estimates for consultants' fees and resident site staff costs  
(in September 2020 prices)**

			Estimated man- months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee (\$ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	1.4
		Technical	-	-	-	0.6
					Sub-total	2.0#
(b)	Resident site staff (RSS) costs (Note 3)	Professional	248	38	1.6	34.1
		Technical	620	14	1.6	30.0
					Sub-total	64.1
	Comprising –					
	(i) Consultants' fees for management of RSS				1.1#	
	(ii) Remuneration of RSS				63.0#	
					<b>Total</b>	<b>66.1</b>

\* MPS = Master Pay Scale

**Notes**

1. A multiplier of 1.6 is applied to the average MPS salary point to estimate the cost of RSS supplied by the consultants (as at now, MPS salary point 38 = \$85,870 per month and MPS salary point 14 = \$30,235 per month).
2. The consultants' staff cost for contract administration is calculated in accordance with the existing consultancy agreement for the design and construction of **172CD**. The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade **172CD** to Category A.
3. The actual man-months and actual costs will only be known after the completion of the construction works.

**Remarks**

The figures in this Enclosure are shown in constant prices to correlate with the MPS salary point of the same year. The figures marked with # are shown in money-of-the-day prices in paragraph 10.

**Enclosure 4 to PWSC(2020-21)22****172CD – Rehabilitation of underground stormwater drains**

## Consultation with District Councils

<b>Date</b>	<b>District Council</b>	<b>Committee</b>
15 May 2020	Tuen Mun	Commerce, Industry and Housing Committee
3 June 2020	Southern	Economy, Development and Planning Committee
23 June 2020	Eastern	Planning, Works and Housing Committee
7 July 2020	Sha Tin	Health and Environment Committee
9 July 2020	Central & Western	Building Management, Environmental Hygiene & Works Committee
14 July 2020	Tai Po	Planning, Housing and Works Committee
7 August 2020	North	Committee on Land Development, Housing and Works
21 August 2020	Sai Kung	Environmental Hygiene, Climate Change, Agriculture and Fisheries Committee
28 August 2020	Islands	Tourism, Agriculture, Fisheries, Environmental Hygiene and Climate Change Committee
3 September 2020	Yuen Long	Housing, Town Planning and Development Committee
4 September 2020	Kwun Tong	Food, Environment and Hygiene Committee
22 September 2020	Wan Chai	Development, Planning & Transport Committee