Binnie 賓尼

協議書編號 CE 78/94

Wan Chai East and North Point Sewerage

灣仔東及北角污水渠系統

Environmental Impact Assessment

環境評估報告書

Executive Summary (Final)

報告摘要

September 1996

一九九六年九月

English Version

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Report Authorized For Issue By:

For and on Behalf of
Binnie Consultants Limited

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1. INTRODUCTION

The Environmental Impact Assessment (EIA) study evaluates the potential environmental impact of the Wan Chai East & North Point Sewerage Project. This executive summary briefly summarises the findings of the Study.

The Study Area splits into two foul sewerage catchment areas: Wan Chai East and North Point. The foul sewerage system collects polluted domestic and industrial flows. In addition, there is a storm water drainage system designed to collect and disperse rainwaters.

At present, all foul and surface water flows pass to Victoria Harbour, with the majority of the foul flows being screened at the Wan Chai East or North Point screening plants to remove screenings and grit before discharge through short outfalls into the Harbour. A significant proportion of foul flows discharge to the storm drains which causes unacceptable pollution to inshore marine waters, in particular the Causeway Bay Typhoon Shelter.

While the strategy for treatment and disposal of foul flows under the Strategic Sewage Disposal Scheme Stage III/IV has not yet been finalised, it is likely that the foul flows will be collected and treated at Stonecutters Island sewage treatment works. The treatment process(es) and level of treatment will be subject to the findings and recommendations of the current SSDS EIA Study.

The Wan Chai East & North Point Sewerage Project, with its improved interception of foul flows and increase in system capacity, is an essential prerequisite for effective implementation of the SSDS.

2. PROPOSED WORKS

The proposed works for this project comprise the following main components:

- Construction of sewers in the Wan Chai East and North Point areas to replace existing sewers of insufficient hydraulic capacity (Priority 1 sewers) and insufficient self-cleansing capacity (Priority 2 sewers). Open cut trenching methods will be used in general. Trenchless construction will be adopted where the traffic or environmental impacts of open cut construction are unacceptable.

- Refurbishment of some existing sewers in Wan Chai East and North Point to effect structural repairs and to reduce inflow and infiltration to the sewerage system.

- Disconnection of expedient foul sewage connections which currently discharge to the storm water system and reconnection to the foul sewerage system to reduce polluted flows in the stormwater systems.

- Construction of a new pumping station at the North Point Screening Plant.

The overall layout plans showing the recommended works for the Wan Chai East and North Point areas are shown in Figures 1 and 2 respectively. The construction works are to be carried out section by section with only small working areas being used at any one time. The overall construction periods for the various works as extracted from the latest works programme are as follows:

Advanced Works:	mid 1997 - mid 1999
Wan Chai East sewerage works:	end 1997 - mid 2002
North Point pumping station works:	end 1997 - mid 2000
North Point sewerage works:	end 1997 - mid 2001

The EIA Study is an important and integral part of the Project, particularly because the proposed works lie within the busy and congested urban areas of Wan Chai and North Point. In addition to the high density commercial and residential developments in the study area, there are many hotels, schools, hospitals, temples and churches. The EIA Study has considered every building in all of the areas likely to be affected by the proposed works. Residences and other sensitive receivers can be as close as 3 to 10 metres from the works.

3. DISCUSSION OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Air Quality

The main air quality impacts due to construction activities are associated with dust and odour. Provided that appropriate measures, such as covering dusty materials on vehicles and keeping the sealed roads clean are implemented, the dust impacts are expected to be minimal. There is a limited potential for odour nuisance. Contract clauses will require that sewer pipes are cleansed by high pressure jetting before removal. Any residual matter removed will be placed in covered containers and taken off-site.

Once completed, the improved hydraulic performance of the sewerage systems in both catchment areas will result in reduced sewage retention times in the sewers, with a significant reduction in odour generation throughout the system.

Odour mitigation at the new pumping station of the North Point screening plant will be achieved by installing high efficiency odour control units. Installation of biofilter or activated carbon units will eliminate any odour nuisance during the operation of the new pumping station. This will be supplemented by good housekeeping practices including regular inspection, cleaning and flushing of screens and other equipment, and a daily walkover survey around the site boundary.

Noise

The study area is generally subject to high ambient noise levels with traffic often the dominant noise source. There will be potential construction noise impacts associated with the construction work within the study area. Without stringent noise mitigation measures, it is expected that the relevant noise criteria will be exceeded during construction.

Noise mitigation measures are particularly essential where, due to traffic constraints, construction works have to be carried out during the evening or night time. The intensity and duration of noise from powered mechanical equipment will be controlled under the *Noise Control Ordinance* for works during Sunday, evening and night hours. In order to undertake works during these restricted hours, contractors must first prove that the equipment and mitigation measures they will use only produces noise levels low enough to meet stringent construction noise permit requirements. The use of silenced powered mechanical equipment, noise barriers, enclosures lined with sound absorption materials and appropriate scheduling of works will be included in the contract clauses to minimise noise impacts on nearby sensitive receivers.

Construction of the new pumping station at North Point Screening Plant is not expected to generate significant noise impacts, because most of the works will be carried out below ground level.

The design of North Point pumping station will ensure minimal noise emissions during operation. The predicted noise levels do not exceed the acceptable noise levels at the nearest sensitive receivers during normal operation.

Water Quality

For the construction phase, appropriate site management and good site practices in relation to runoff and drainage control will be specified and enforced. No major impact on water quality is predicted.

Closure of the Watson Road outfall has already achieved some improvements in Victoria Harbour's water quality. The reconnection of expedient foul sewer connections from the storm drains to the foul system will considerably reduce polluted flows in storm drains. The North Point and Wan Chai East screening plants and outfalls have adequate capacity to cater for the increased flows. Provision of adequate hydraulic capacity in the sewerage system and reduction of infiltration and stormwater inflows will minimise foul sewage overflows to the stormwater system and flooding during severe rainstorms. These works will result in considerable improvements to the water quality in the Causeway Bay Typhoon Shelter and will contribute to an overall improvement in water quality in Victoria Harbour.

Waste and Spoil Management

No major waste impacts are predicted. Material from excavations which are unsuitable as backfill material such as concrete waste, bricks, boulders and old sewer pipes will be removed for use in reclamation or disposal at public dumps. Suitable excavated material will be reused as backfill material. Used bentonite will be collected, separated and recycled. In line with current practice, screenings from the new pumping station will be collected in labelled drums with covers and delivered to landfill.

Ecology

No major ecological impacts are predicted. The sewerage works will take place in urban areas of Wan Chai East and North Point, within the road reserve. A tree survey has been carried out as part of the Engineering Design Process. The sewerage works have been planned to avoid damage to, or removal of, existing trees. If it becomes essential to remove any trees, transplanting or compensatory planting will be undertaken in conjunction with Urban Services Department and Agriculture & Fisheries Department.

Environmental Contract Clauses and EM&A Programme

All construction impacts will be contained within acceptable levels by a series of practical, effective and enforceable contract clauses backed up by an Environmental Monitoring and Audit (EM&A) Programme. An Environmental Monitoring and Audit Manual has been developed to ensure that environmentally acceptable construction practices are adopted throughout the works.

4. CONCLUSIONS

The Wan Chai East & North Point Sewerage Project is an integral and essential part of Hong Kong Government's on-going programme to improve Hong Kong's sewerage and sewage treatment facilities and the quality of its inshore marine waters. The improvement works will substantially rectify deficiencies in the current sewerage system.

In order to implement these improvements, short term environmental impacts are unavoidable during the construction period. Stringent noise mitigation will be used to ensure that noise levels remain within the statutory standards and noise impact will be short-term and localised. All other potential impacts are very minor in nature.

The Wan Chai East & North Point Sewerage Project will result in a sewerage network capable of meeting the existing and future developments in both Wan Chai East and North Point as well as contributing to the improvement of water quality in the Harbour.

Chinese Version

中 文 譯 本

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1. 簡介

本摘要旨在總結就灣仔東及北角污水系統改善工程對環境影響的評估結果。

研究範圍包括兩個污水收集區：灣仔東及北角。該等區域除有污水渠系統以收集住宅及工業污水外，尚有雨水渠系統收集雨水。

現時所有污水及雨水皆排放入維多利亞港，其中大部份的污水先經灣仔東隔濾廠或北角隔濾廠除沙及隔濾固體懸浮物後才排放出海。但有部份污水直接注入雨水渠而流入海港，做成嚴重的污染，尤以銅鑼灣避風塘爲甚。

雖然目前策略性污水排放計劃的第三及第四期工程尚未有最終定案，但預計將來收集後的污水會先送往大型污水處理廠處理後才排放。至於有關的污水處理程序及排放方式，仍有待策略性污水排放計劃研究的結論和建議。

灣仔東及北角污水系統改善工程是配合策略性污水排放計劃的一個重要部份，這計劃一旦完成後，對灣仔東及北角的污水系統將會得到顯著的改善。

2. 建議之工程

這計劃建議之工程包括以下幾個重點：

- 在灣仔東及北角區內敷設新的污水渠，用以更換現時超負荷的污水渠（稱爲第一優先污水渠）及缺乏自動清洗能力的污水渠（稱爲第二優先污水渠）。施工將採用明挖法或無坑挖掘法。當採用明挖法會對交通及環境構成不可接受之影響時，將採用無坑挖掘法施工。

- 修補部份現時在灣仔東及北角的污水渠，以減少水流滲入污水收集系統。

- 清拆現時非法接駁入雨水渠系統之污水渠，以減少污水流入雨水渠系統。

- 於北角污水隔濾廠興建新的污水泵房。

所建議的灣仔東及北角區的污水系統改善工程之整體藍圖見圖一及圖二。建築工程將會分成小段進行。現時預算的工程計劃如下：

灣仔東及北角之前期污水渠改善工程	：	一九九七年中開始，一九九九年中完成
灣仔東污水系統改善工程	：	一九九七年底開始，二零零二年中完成
北角新污水泵房工程	：	一九九七年底開始，二零零零年中完成
北角污水系統改善工程	：	一九九七年底開始，二零零一年中完成

環境影響評估研究是這個計劃中十分重要的一部份，因爲施工地點位於灣仔及北角之繁忙地區。除了高密度之商業及住宅樓宇外，區內還有很多酒店、學校、醫院、廟宇及教堂。其中部份住宅及易受影響的地方距離施工地點只有三至十米。本評估已顧及區內每一所可能受工程影響的樓宇。

3. 環境影響及舒緩措施

空氣質素

施工時對空氣質素之主要影響爲塵埃及氣味。祇要採用適當的舒緩措施，塵埃的影響將會十分輕微。這些措施包括向泥土灑水、在貨車離開工地前將棄泥弄濕，以及把泥斗用帆布覆蓋，並把車輪清洗以保持路面清潔。至於氣味方面的影響亦會是有限的，因爲工程合約的條文內將要求承建商在更換舊污水渠之前，必須先用高壓噴射方法清洗。渣滓亦要存放在有蓋的桶內方可運走。

工程完成後，區內的污水收集系統將會得到改善，減少污水停留在污水渠內的時間，因而大大減少臭氣產生之可能。

北角隔濾廠的新污水泵房將會安裝高效率的生物隔濾或活性炭過濾除臭設施，用以減少臭氣產生。除此之外，加強良好的管理措施亦有助減少臭氣的產生，這包括定期檢查，清潔過濾網和其他有關設備，及每日巡查泵房週邊等。

噪音

評估範圍普遍受到主要來自交通的高噪音量影響。在施工期間，工程鄰近的地方將受到一定程度的噪音影響。假若沒有嚴格之噪音舒緩措施，噪音水平預料會超出有關的制定水平。

舒緩由施工所引起的噪音是十分重要的，尤其是對於因交通因素而須在黃昏或晚間進行施工的地點，舒緩措施更爲重要。凡在星期日、黃昏及夜間施工，所有由機器所產生的噪音強度及時間都受噪音管制條例限制。如需要在管制時間內施工，承建商必須申請噪音許可證，其先決條件是必需證明所採用的機器及舒緩措施能符合建築噪音許可證的要求。工程合約的條文將建議使用低噪音型的機械設備、設置隔聲屏障、採用吸音物料覆蓋聲源及配合適當的施工程序等以減少噪音對鄰近的影響。

北角隔濾廠的新污水泵房，大部份工程將會在地底進行，因此不會造成嚴重的噪音污染。

該污水泵房在設計上已盡可能減少操作時產生的噪音，故預料在正常運作時所發出的音量，將不會超越噪音限制水平。

水質

在施工期間，將執行正確的工地管理及雨水渠和地面徑流的控制，預料不會對水質構成嚴重的影響。

在屈臣道的污水排水口封閉後，海港水質已得到初步改善。而錯誤接駁到雨水收集系統的污水渠將會重新接妥，以減少污水流入雨水渠而造成污染。而北角及灣仔東的污水隔濾廠和排水口將有足夠的能力應付增加的污水量。改善後的污水收集系統除了有足夠的容量外，並會減低地下水滲入污水系統內，因而減少暴雨而引致的污水溢流及水浸。這將有助改善銅鑼灣避風塘及維多利亞港的水質。

廢物及棄土管理

預料工程的廢物及棄土將不會對區內產生影響。由施工所產生不適合作回填材料的廢物，包括泥土、混凝土、磚頭、大石及舊的污水渠等將會作填海用途或棄置在公眾傾卸區。合適的挖掘料將用作回填材料。膨潤土的廢料將會被收集、分類及循環再用。由北角新污水泵房隔濾出的篩屑將如現行的措施一樣，用附有標記的桶收集並蓋好，然後運送至堆填區棄置。

生態

施工地點位於灣仔及北角區內的道路上，預料不會對區內的生態構成嚴重影響。在工程設計時已對區內的樹木進行了全面的測量，並盡量防止工程對該等樹木造成損害。所有因爲工程需要而進行的樹林砍掉、移植或補償種植，將會事先得到市政總署及漁農處的批准。

工程合約的環境條文和環境監察及審核計劃

一系列實際、有效及可執行的工程合約條文，加上一套完整的環境監察及審核計劃，將可確保施工期間所造成的環境影響控制在可接受的程度內。

4. 結論

灣仔東及北角污水改善工程是香港政府致力改善污水的收集及處理和沿岸水質之整體計劃中的重要部份。工程將會顯著改善這兩區現時污水收集系統不足之情況。

爲了進行這工程，於施工期間將無可避免地對環境產生輕微的不良影響。但此等影響，特別是噪音將會是短暫及局限於施工區內，而整個工程將實施嚴格的環境舒緩措施，確保受影響程度維持在法定的標準內。

這計劃完成後，灣仔東及北角地區的污水系統將會有明顯的改善，而政府全面改善海港水質的目標，亦跨出了一大步。

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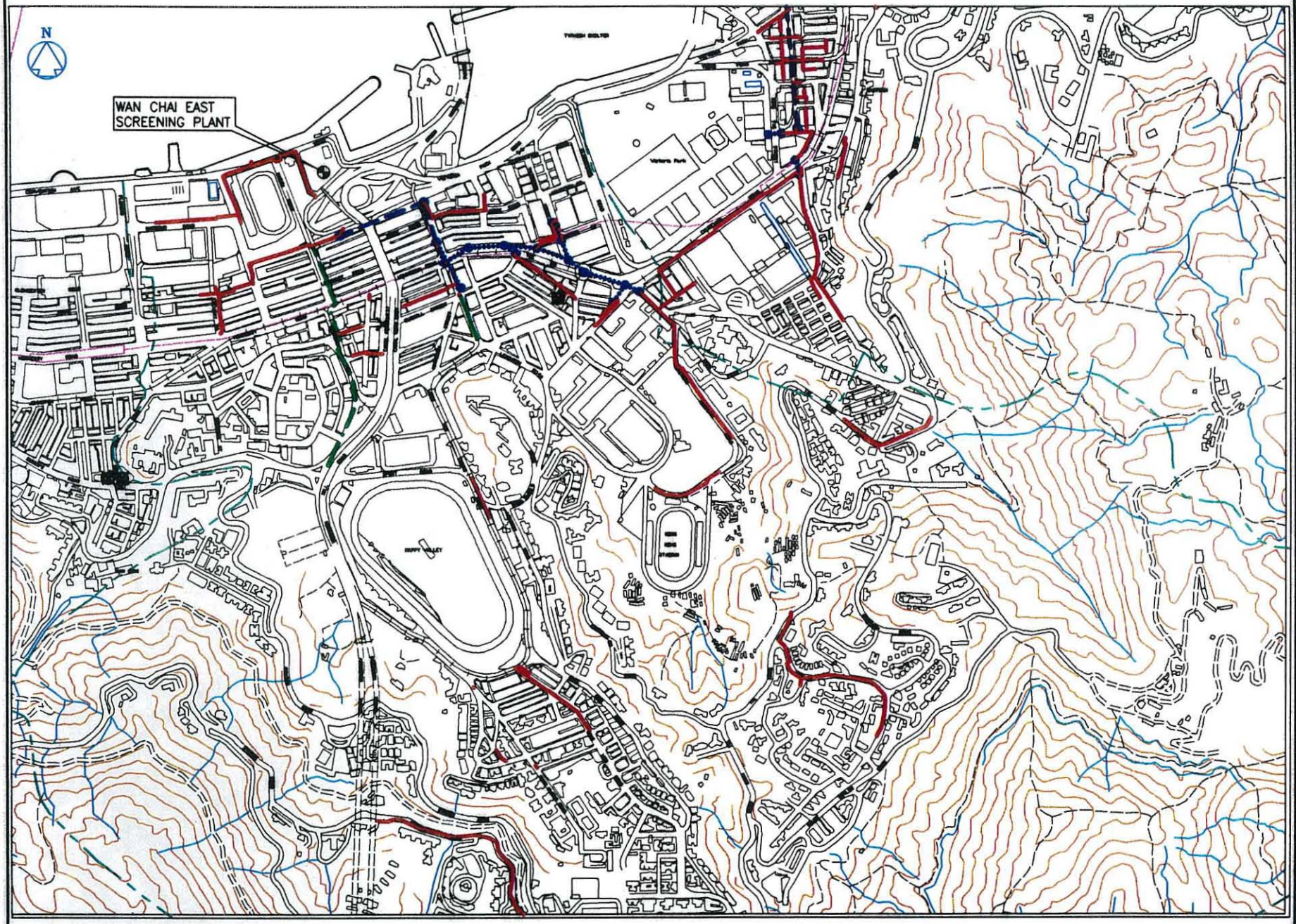

LEGEND

- Deep Tunnel & Shaft
- Open Cut
- Shallow Tunnel & Shaft
- DWF
- Catchment Boundary
- Market Interceptor
- DWF Interceptor

revision	date	description			initial
A	8/96	ISSUE FOR FINAL PRELIMINARY REPORT			
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initial		SLC	DPL	LC	DPL
date		24/4/96	24/4/96	24/4/96	24/4/96

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project: **Wan Chai East & North Point Sewerage**

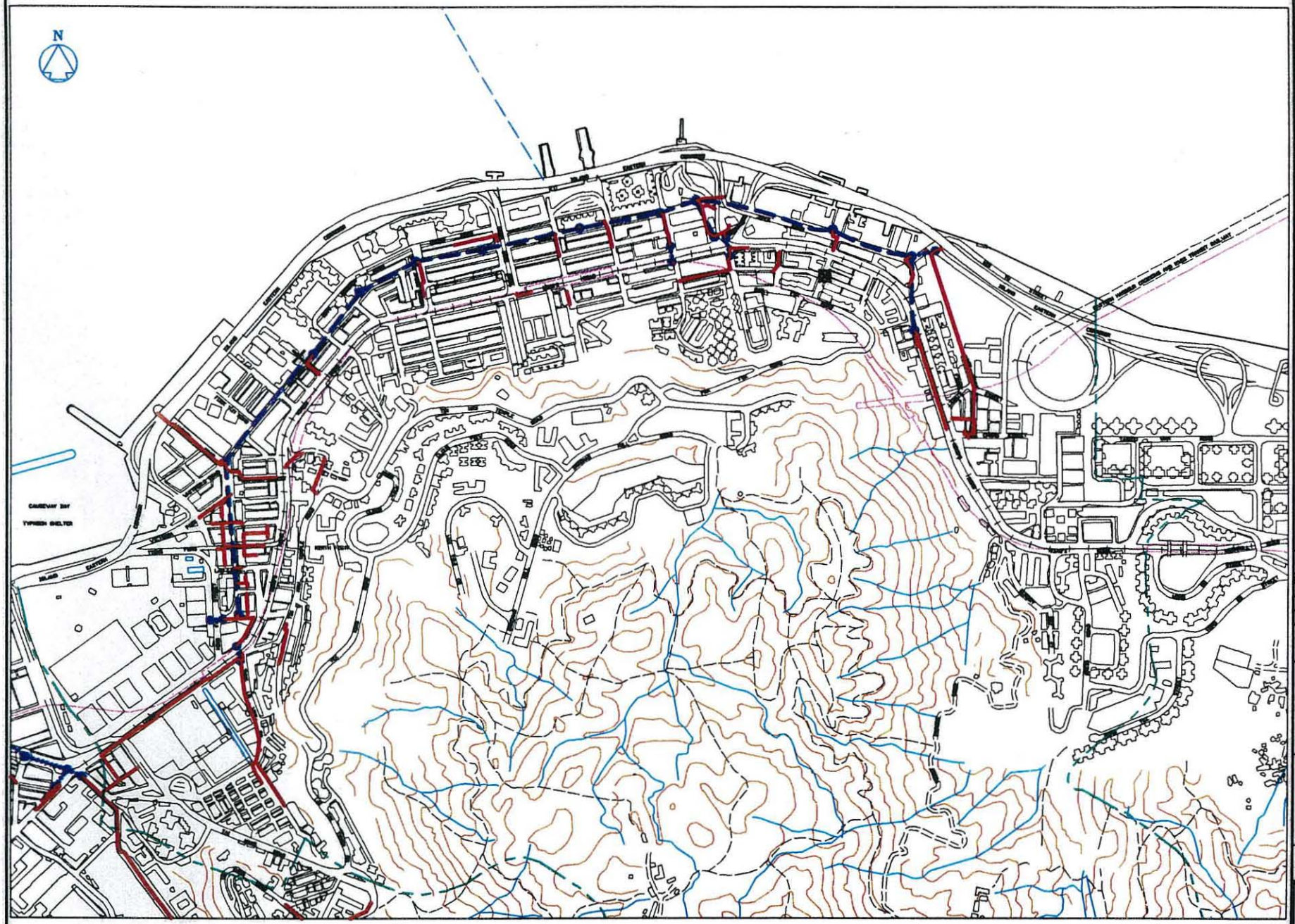
drawing title: Recommmended Works Wan Chai East

figure no.: 1

scale:

client: DRAINAGE SERVICES DEPARTMENT

consultant: BERNIE CONSULTANTS LIMITED 貴尼工程顧問有限公司



LEGEND

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project: Wan Chai East & North Point Sewerage

drawing title: Recommended Works North Point

figure no. 2

scale

client: DRAINAGE SERVICES DEPARTMENT

consultant: BOSKE CONSULTANTS LIMITED 寶尼工程顧問有限公司

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