

## Legislative Council Panel on Planning, Lands and Works

### **330WF – Remedial works for the rip-rap at the main dam of Plover Cove Reservoir**

#### **PURPOSE**

This paper briefs Members on the Administration's proposal to upgrade **330WF** – “Remedial works for the rip-rap at the main dam of Plover Cove Reservoir” to Category A at an estimated cost of about \$51.4 million in money-of-the-day (MOD) prices to repair the rip-rap protection layer of the main dam of Plover Cove Reservoir.

#### **BACKGROUND**

2. The rip-rap protection on the upstream face<sup>1</sup> of the main dam of Plover Cove Reservoir is showing signs of erosion and deterioration. It is necessary to carry out remedial works as soon as possible to prevent further erosion.

3. The project **330WF** was included in Category B in October 2004.

#### **PROPOSAL**

4. The scope of the remedial works under **330WF** comprises -

- (a) placement of about 80,000 cubic metres large rocks of weight ranging from 1 to 6.5 tonnes to the eroded rip-rap areas in the lower part of rip-rap protection layer of the main dam; and
- (b) infilling of gaps between large rip-rap rocks with small stones of size ranging from 150 to 300 millimetres in the upper part of rip-rap protection layer of the dam, and grouting with flexible cementitious materials.

A site plan and a cross section of the main dam showing the scope of works under **330WF** are at **Enclosures 1** and **2** respectively.

5. We plan to commence the remedial works in June 2006 for completion in December 2008. The works have been designed and will be supervised by in-house staff.

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<sup>1</sup> “Upstream face” means the face of the main dam facing Plover Cove Reservoir.

## JUSTIFICATION

6. Plover Cove Reservoir was commissioned in 1968. The 2 kilometres long main dam of Plover Cove Reservoir is protected by a layer of large rocks called rip-rap. Having been attacked by strong waves generated during typhoon periods in the last 38 years with no protection by any nearby natural landscape, the rip-rap rocks of the upstream face have shown signs of displacement and erosion. An investigation of the dam was conducted in 2002. The investigation concluded that erosion had extended to the whole rip-rap above 4 m PD (i.e. metres above Principal Datum<sup>2</sup>) with various degrees of severity, including the displacement of the rip-rap rocks of the upstream face resulting in a thinner and weaker protective surface. The thickness of the rip-rap protection layer has been reduced from 3.5 metres (m) to about 1 m at the most severe locations. If the rip-rap is not repaired, there is a risk that it will be eroded further during typhoons in the coming seasons leading to the erosion of the dam itself, and the integrity of the main dam will be endangered.

7. Upon completion of the proposed works, the integrity of the rip-rap protection layer of the main dam will be restored.

## FINANCIAL IMPLICATIONS

8. We estimate the capital cost of the proposed works to be \$51.4 million in MOD prices, made up as follows –

	<b>\$ million</b>
(a) Remedial works	
- Placement of rip-rap rocks	37.9
- Infilling of gaps with small stones and grout	8.3
(b) Environmental mitigation measures	0.5
(c) Contingencies	4.7
Total	51.4 (in MOD prices)

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<sup>2</sup> Principal Datum is the vertical or height datum used for land surveying in Hong Kong. It is based on the Mean Sea Level (MSL) derived from 19 years (1965 - 1983) of tidal observations taken at the automatic tide gauge at North Point, Victoria Harbour and is 1.23 m below MSL.

9. The project will not give rise to additional annual recurrent expenditure.

## **ENVIRONMENTAL IMPLICATIONS**

10. This is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). The project will not cause long term environmental impact. We have included \$0.5 million (in MOD prices) in the project estimates to implement suitable mitigation measures to control short term environmental impacts.

11. We have considered the proposed remedial works in the planning and design stages to reduce the generation of construction and demolition (C&D) materials where possible. We will encourage the contractor to maximize the use of recycled or recyclable C&D materials, as well as the use of non-timber formwork to further minimize the generation of construction waste.

12. We will also require the contractor to submit a waste management plan (WMP) for approval. The WMP will include appropriate mitigation measures to avoid, reduce, reuse and recycle C&D materials. We will ensure that the day-to-day operations on site comply with the approved WMP. We will control the disposal of public fill and C&D waste to public fill reception facilities and landfills respectively through a trip-ticket system. We will require the contractor to separate public fill from C&D waste for disposal at appropriate facilities. We will record the disposal, reuse and recycling of C&D materials for monitoring purposes.

13. We estimate that the project will generate about 1,484 tonnes of C&D materials. Of these, we will deliver 1,413 tonnes (95.2%) to public fill reception facilities<sup>3</sup> for subsequent reuse as public fill. In addition, we will dispose of 71 tonnes (4.8%) at landfills. The total cost for accommodating C&D materials at public fill reception facilities and landfill sites is estimated to be \$47,026 for this project (based on an unit cost of \$27/tonne for disposal at public fill reception facilities and \$125/tonne<sup>4</sup> at landfills).

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<sup>3</sup> Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation. Disposal of public fill in public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

<sup>4</sup> This estimate has taken into account the cost for developing, operating and restoring the landfills after they are filled and the aftercare required. It does not include the land opportunity cost for existing landfill sites (which is estimated at \$90/m<sup>3</sup>), nor the cost to provide new landfills, (which is likely to be more expensive) when the existing ones are filled.

14. The proposed remedial works will not involve any tree removal or planting proposals. Since the proposed remedial works mainly involve the placing of rip-rap rocks, the effect on water quality in the reservoir will be minimal. We will nonetheless implement appropriate precautionary measures, such as floating boom and silt curtains. The sea water quality of Plover Cove will not be affected as the proposed remedial works will only be carried out on the protection layer on the upstream face of the dam.

### **TRAFFIC IMPLICATIONS**

15. The main dam crest road will not be used for transporting rocks and remain open throughout the construction period. We will require the contractor to transport the rocks by sea. The traffic implications arising from the project will be minimal.

### **PUBLIC CONSULTATION**

16. We consulted the Environment, Housing and Works Committee of the Tai Po District Council on 15 July 2005. The Committee supported the project.

### **LAND ACQUISITION**

17. The project does not require land acquisition.

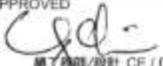
### **JOB CREATION**

18. We estimate that the proposed works will create 35 jobs (30 for labourers and another five for professional/technical staff) providing a total employment of 750 man-months.

### **WAY FORWARD**

19. We intend to submit our proposal of upgrading **330WF** to Category A for consideration by the Public Works Subcommittee in January 2006 with a view to seeking funding approval of the Finance Committee in February 2006.



核准 APPROVED  
  
 5/11 / 2005  
 (甲級工程)  
 (CAT 'A' Submission)

工務計劃項目第 9330 WF 號 — 船灣淡水湖主壩拋石護坡修葺工程  
 P.W.P. item no.9330WF — Remedial works for the rip-rap at the main dam of Plover Cove Reservoir  
 (二之一)  
 (SHEET 1 OF 2)

水務署  
 WATER SUPPLIES DEPT.  
 草圖編號  
 SKETCH NO. SK 62005 / 091 / 001

附件一 ENCLOSURE 1

地盤邊界  
SITE BOUNDARY

米 主水平基準  
m PD

主壩頂路  
MAIN DAM CREST ROAD

防波牆  
WAVE WALL

完工剖面  
FINISHED PROFILE

頂水位  
TOP WATER LEVEL 13.41m PD

現有剖面  
EXISTING PROFILE

拋石保護層  
RIP-RAP PROTECTION LAYER

船灣淡水湖  
PLOVER COVE RESERVOIR

風化石填料  
DECOMPOSED ROCK FILL

中央石芯  
CENTRAL  
ROCK CORE

擬定修葺工程的圖例：  
LEGEND OF PROPOSED REMEDIAL WORKS :

● 新放置的拋石  
NEWLY PLACED RIP-RAP STONES

■ 在大型拋石之間以碎石填補表層的空隙並灌漿  
INFILLING GAP BETWEEN LARGE RIP-RAP STONES WITH SMALL ROCKS AND GROUTING

主壩橫切面圖  
CROSS SECTION OF THE MAIN DAM

比例尺 SCALE 1 : 150

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工務計劃項目第 9330 WF 號 — 船灣淡水湖主壩拋石護坡修葺工程

P.W.P. item no.9330WF — Remedial works for the rip-rap at the main dam of Plover Cove Reservoir

(二 之 二)  
(SHEET 2 OF 2)

水務署  
WATER SUPPLIES DEPT.

草圖編號  
SKETCH NO. SK 62005 / 091 / 002

5 / 11 / 2005

(甲級工程)  
(CAT 'A' Submission)

附件二 ENCLOSURE 2